Museu de Arte de São Paulo (1957-1968), Lina Bo Bardi

São Paulo is a city of color, of culture and of contrast, of lush greenery and stark concrete, of steep hills and flat plateaus, of quiet solitude and bustling chaos. These elements can be found ebbing and flowing along one of the main avenues in the city. The Paulista Avenue has been the center of economic, political, and cultural activity since it was developed in 1891 as a luxury district within the city, with large villas in eclectic styles.[1]

One plot of land along the avenue was saved from development by a city ordinance that was created along with the thoroughfare, , preserved as open air to keep the view down towards the valley to the central, historic part of the city.[2] Originally the area was called the Trianon Terrace and, due to its central location along the main thoroughfare in one of the most important neighborhoods in São Paulo, became a stage within the city.[3] As modernization and urbanization took place in São Paulo, the street scape of Paulista Avenue was affected dramatically, and quickly changed from the setting of posh villas, to the most important commercial and business district of the country.[4]

The Museu de Arte São Paulo (MASP) secured itself as the future tenant of this site after its former occupant was demolished in 1951, and Lina Bo Bardi (1914-1992), the wife of the then museum director, Pietro Maria Bardi, was immersed in the task of designing the new project.[5] The Italian-Brazilian architect intended to do more than just preserve the land and the vistas that were the Trianon Terrace,

but also give the space back to the city and to the people which it held. She said of her aim, "I was looking for simple architecture, one that could immediately communicate that which in the past was known as 'monumental', that is, in the sense of the 'collective', of 'Civic Dignity'."[6] Controversy arose following the deaths of both Bardis when the new museum administration made subsequent changes in the Lina Bo Bardi designed layout and artwork presentation of the main gallery. The conflict surrounded the replacement of the original glass easels upon which the collection hung with a typical gallery wall layout.[7]

A plea for a reconsideration of these fundamental changes from Dutch architect Aldo Van Eyck can be found in a 1997 publication by the Instituto Lina Bo e P.M. Bardi: "The point is that these two outstanding gestures - the exterior one [the architecture] and the interior one [the easels] - are interdependent, belong together, tuned as they are to the same mental key: Lina Bo Bardi's *uncompromising- simultaneous- solidarity with people, art and architecture."*[8] To understand this passionate appeal for the re-implementation of Lina Bo Bardi's original design elements of the glass easels, one must understand first the logic and rational of the building which surrounds and shelters them, and the dichotomies which are inseparable from the whole composition. In her search for an architecture for both the city and for the museum, she also discovered one of chaos and order, of weight and weightlessness, one both concealing and revealing. These architectural contrasts can be examined threefold: 1) in its civic hall which is buried within the slope of the site, 2) in its public terrace which is open to the city and the busy street

beside which it is situated, 3) and in its art gallery which is suspended above.

This idea of contrast in her architecture can be viewed in a pure distillation in the Pinacoteca (picture gallery) in the art museum above, as the concrete, wood, and glass easels from which the artwork in the permanent gallery is now displayed again, thanks in part to the efforts of Van Eyck and the Insituto Lina Bo e P.M. Bardi.

Order and Chaos

Fig. 1. Lina Bo Bardi, drawing by architect – example of activity on the terrace, MASP, São Paulo, Brazil, 1957 – 1968. Image from Artstor.

Walking down the broad and bustling Paulista Avenue, one notices a hulking raw concrete and glass rectilinear form that is seemingly suspended from two large red piers that rise from street level and

span its length from either side. Approaching closer and it is seen that underneath the grey belly of this mass lies a large cobbled plaza, upon which there are black and white stripped tents pitched for a pop-up market. Closer, now out of the street bustling with activity and onto its sidewalk, the pedestrian is underneath the concrete span, at the only occurrence on the avenue where a building reaches out from its zoned setback over the pedestrian pathway. This reach allows the sidewalk, street, architecture, and plaza to flow together almost seamlessly as extensions of each other. This architecture and plaza are the Museu de Arte São Paulo, Lina Bo Bardi's realization of her vision for the Trianon Terrace [Fig. 2].

Fig. 2. Lina Bo Bardi, Tianon Terrace and MASP from SE, São Paulo, Brazil, 1957-1968

Fig. 3. Lina Bo Bardi, Tianon Terrace and MASP from NW, São Paulo, Brazil, 1957-1968

Fig. 4. Lina Bo Bardi, depth of plaza, Trianon Terrace, São Paulo, Brazil, 1957-1968

Underneath this reach of building over sidewalk, the boundary of the sidewalk and the plaza is delineated by a change from the grey pavement of the sidewalk to the brown cobbled surface. A set of stairs of the same material as the concrete above and seemingly cut and folded down from its massive span connects the street activity with the art galleries above.

Engulfed by the tall stairwell, a sudden feeling of disconnection from the chaos of the street and terrace below is overcoming, and the visitor is now at the gate of transition between that one of the city, and the one that lay before and above, one of order and stillness. Continuing up the stair from below, and through another thick punctured hole in the board formed concrete, the visitor is released onto a landing of black matt rubber tiles that lay before a large glazed wall with double swinging doors. This floor is evidence of the design idea of contrast within the project, as it not only contrasts in material of the stone terrace below, but it also dampens the sound in the gallery, creating for the visitor a quiet relief from the street and plaza below.

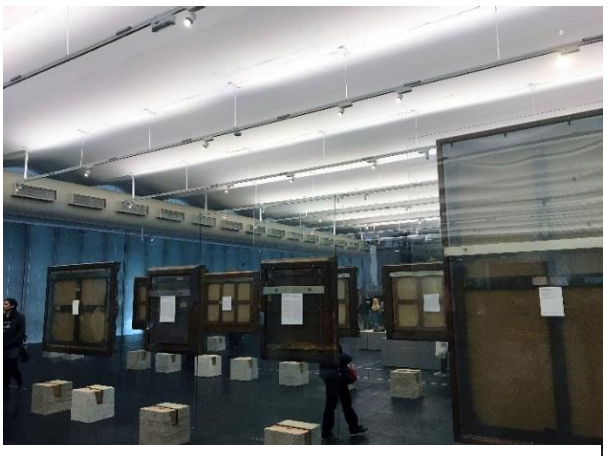


Fig. 5 - 6 Lina Bo Bardi, Display Easel, front and back, MASP, São Paulo Brazil, 1957 - 1968

As the masses of people are scattered on the plaza below, these paintings too are scattered throughout this field of space [Fig. 5-6]. Observers are free to move about and around them, as no order is specifically laid out to follow. As impressive as the collection is, the eye is immediately drawn to the easels [Fig. 7-8]. Their heavy bases of cubes of board formed concrete are scattered about the floor of the gallery, each one clenching, with the help of a wooden block insert that is buried into it like the building bellow into the hillside, a sheet of tempered glass, its edges visible only upon close examination. These sheets of glass would be dangerous if not for the framed paintings which seem, from a distance, to float upon their surface, suspended in space above the heavy base.

Fig. 7 - 8 Lina Bo Bardi, Display Easels, MASP, São Paulo Brazil, 1957 - 1968

There are many discussions of the success of these easels, which were brought back in 2014 in a redesign by local architecture group METRO Arquitetos during a larger restructuring period of the museum. The new director Adriano Pedrosa and the Executive President of the board Heitor Martins, reintroduced them "to make MASP a solid and efficient institution, to promote its artistic development, to

reconnect with the public and the city, and to regain a more open, plural and transversal character that has been associated with the institution since its inception."[9] Most of these arguments for its success talk about its unique way of allowing the public to see the art, away from walls and away from illusions that call them windows into another time, they will refer to them as freeing the art from its walls onto which they are historically trapped in 'normal' galleries, where behind them is usually flat walls with colors and textures arbitrary, of context far removed from that in which they were originally made.[10] However, as those valid points are not being disputed, the focus is found elsewhere, in the relationship of these concrete, wood, and glass easels with the architecture itself, and how they are both, together and separately, telling the same story and achieving the same dualities of contrast.

Weight and Weightlessness

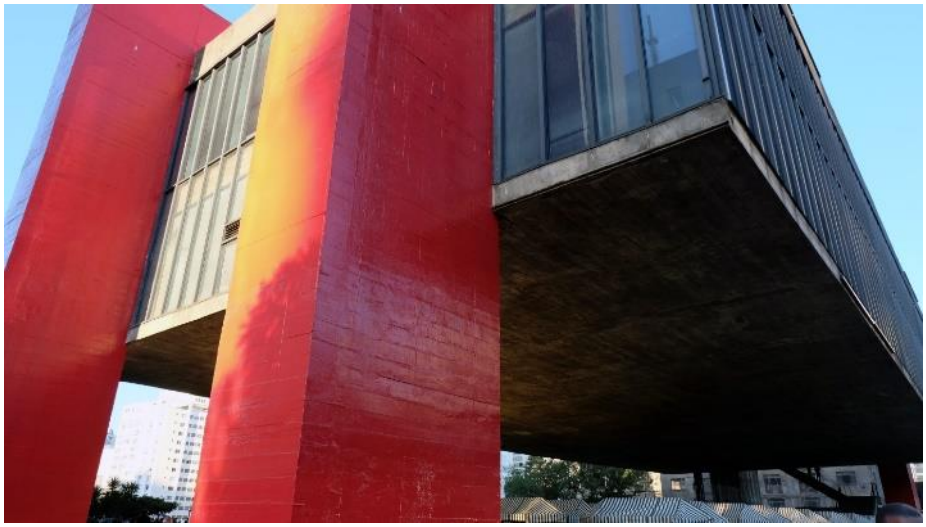


Fig. 9 Lina Bo Bardi, pre-tensions piers with mass of gallery, MASP, São Paulo Brazil, 1957 - 1968

The easels and the architecture of the building are each contained in three parts - the concrete, wood, and glass of the easels - and the civic hall, terrace, and art gallery of the architecture. Understanding this containment in these separate but connected elements, it begins to become clear the parallels of design concept and their representations of contrast. One can first begin to see the contrast of weight and weightlessness in their designs.

In the easels, the weight is provided by the solidity of the heavy bases of board formed concrete. Together in the Pinecoteca space, they seem like islands, scattered across the room upon the black matt floors in no quickly understandable order or reason, providing gravity and 'place' for the art that hovers above. This weight is also seen in the architecture of the whole building where the civic hall, the portion of the building that is buried into the slope aside Avenue Paulista and upon which the terrace rests and the museum hovers, both supports and provides a solid foundation and 'place' where the museum can rest.

In the easels, weightlessness is provided above the concrete base in the hung paintings and their frames by the slim plane of glass that support them, allowing for the perceived levitation of the artworks in a field across the open gallery space. In the architecture, the weightlessness is provided in the apparent levitation of the gallery by the four red piers of pre-tensioned concrete that rise from foundation of the civic hall below [Fig. 9], through the pools of

water that straddle and add boundary to the terrace, and across the length of the gallery, allowing the structure below to be hung with an internal steel girder system. This weightlessness through apparent levitation was achieved structurally using a patented engineering process of pre-stressed concrete developed specifically for this project, allowing the MASP to have the longest structural span without intermediate supports in Brazil.[11]

Concealing and Revealing

Fig. 10 Lina Bo Bardi, view of terraced civic hall and museum above, MASP, São Paulo Brazil, 1957 - 1968

The contrast observed here are elements which are both concealed and revealed, at some points hidden from view, and at others imposing in their formation. The idea is further revealed to the viewer in the architecture which lies underneath this suspended gallery and makes up the rest of the building. Approaching the museum from the bustling avenue, the attention of the visitor would certainly first be captured

by the massive red piers and the span which they support, before being called outward, underneath and past the gallery over the plaza. Here the horizon is marked by the buildings of the sprawling city beyond that are partially concealed by the tall plants which flourish in the planters that mark the terraces boundary. The brown cobblestone paving of this terrace begins underneath the suspended gallery at the edge of the avenues sidewalk, and continues flat, at sidewalk level, to this termination of plants, concealing what is below.

As this plaza conceals the portion of the building which is built into the sloping topography, it also serves to reveal it in a manner more obvious than if the plaza were absent. This happens both on the plaza, at that tree marked delineation where the visitor can look out towards the city and down to the terraced planters on the facade which continues below, and on those smaller streets which follow the natural slope and provide circulation around the terrace. The contrast of the flat plaza and of the architecture which has been built into the slope would not be apparent without the concealing and revelation provided by these vantages.

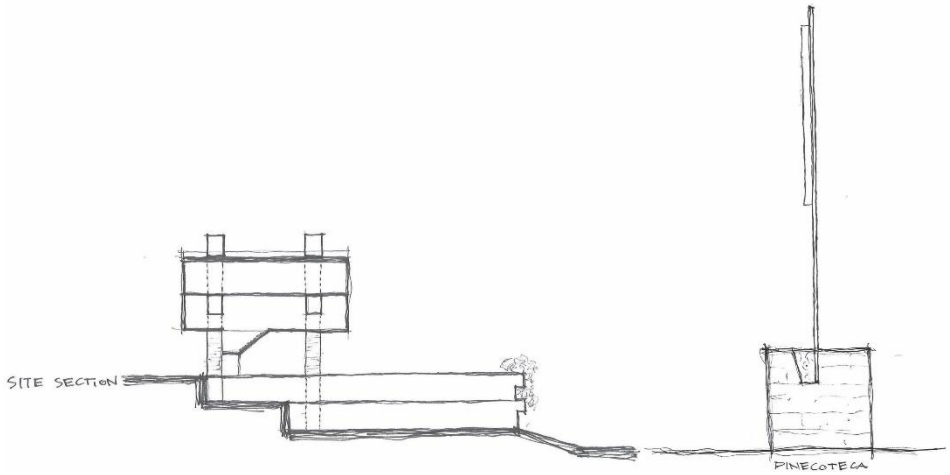


Fig. 11 Lina Bo Bardi, site section and easel drawing, MASP, São Paulo Brazil, 1957 – 1968. Drawings by author.

This concealing and revealing is also apparent, as in the floor of the plaza below, in the floor of the gallery above. The flat black rubber tiles that run the distance of the Pinecoteca space are simple, and attention is surely drawn to the paintings and their easels which scatter its surface, seemingly an unimportant material on which the art is place. But it is noticed when inspection of the easels reveals the texture of the simple black floor. The parallel grooves do more than give texture to the floor, they seem to also bound the concrete blocks above, giving to them a 'place' which would otherwise be lost without them.

Sitting on this black textured surface, the easels themselves also embody this this idea of contrast though concealing and revealing, in their simple composition of concrete, glass, and wood. The tempered glass is transparent, concealed by its material nature, and only revealed by the placement of the art upon its flat surface. This is further emphasized by the way the glass is held structurally, within the wood and board formed concrete below. The wood inset functions as the mechanism which allows the glass to be removed and interchangeable, but it also serves to emphasize the marriage of the glass and concrete, calling attention to it and revealing its structure.

The long HVAC ducts suspended above the easels and their art follow the length of the sky-like ceiling on either side of the room, concealing the edge and the meeting of the white painted surface of undulating board-formed concrete with long windows that run with

vertical mullions at three feet increments. The continuation of these mullions is hidden downward, giving to them the illusion of being buried beneath the black floor.

Thus, it is seen in these dichotomies; order and chaos, weight and weightlessness, and concealing and revealing, the idea of contrast which Lina Bo Bardi employed to drive her design for the Museo de Arte de São Paulo.

Endnotes

[1] Zueler R. Lima and Vera M. Pallamin, *Claiming Public Space: São Paulo's Trianon Terrace,* (Progressive Planning: Citizen, Democray, & Public Space, July 28, 2008), 35.

[2] Brian J Godfrey, *Revisiting Rio De Janeiro and São Paulo*, (Geographical Review 89, no. 1 1999): 94-121. doi:10.2307/216142.

[3] Zueler R. Lima and Vera M. Pallamin, *Claiming Public Space: São Paulo's Trianon Terrace,* (Progressive Planning: Citizen, Democray, & Public Space, July 28, 2008), 35.

[4] Ibid.

[5] Zueler R. Lima and Vera M. Pallamin, *Claiming Public Space: São Paulo's Trianon Terrace,* (Progressive Planning: Citizen, Democray, & Public Space, July 28, 2008), 34-39.

[6] Lina Bo Bardi and Aldo Van, Eyck. São Paulo Art Museum: São Paulo, Brasil, 1957-1968. São (Paulo: Instituto Lina Bo e P.M. Bardi, 1997).

[7] Veikos, Cathrine. "To Enter the Work: Ambient Art." Journal of Architectural Education (1984-) 59, no. 4 (2006): 71-80. http://www.jstor.org/stable/40480633.

[8] Lina Bo Bardi and Aldo Van, Eyck. São Paulo Art Museum: São Paulo, Brasil, 1957-1968. São (Paulo: Instituto Lina Bo e P.M. Bardi, 1997).

[9] Mauricio Jorge, "Adriano Pedrosa Appointed Artistic Director." E-flux.com. October 31, 2014. Accessed October 23, 2017. http://www.e-flux.com/announcements/30423/adriano-pedrosa-appointed-artistic-director/.

[10] Lima, Zeuler R. M. de A. Lina Bo Bardi. New Haven: Yale University Press, 2014.

[11] Ibid, 125.

Kaiser Wilhelm Gedächtniskirche, 1959–1963, Egon Eiermann

Situated around the ruins of the bombed-out shell of a Neo Romanesque Church bell tower, on a raised platform in the center of the Breitscheidplatz along the Kurfürstendamm in what was the cultural and economic center of West Berlin during the cold war, sits the new Kaiser Wilhelm Gedächtniskirche, or Memorial Church, designed in 1959 by German architect Egon Eiermann (1904-1970).

In the design for the church, Eiermann broke from his typical emulation of Mies Van der Rohe, of whom he often spoke highly and whose design philosophy stemmed from the 18th Century Jesuit Priest and theorist Marc-Antoine Laugier's writings on the ideal elements of architecture. His project, instead, demonstrates studies of enclosure relating to Gottfried Semper (1803 – 1879), a German architect and theorist.[1] This paper shall discuss the success of this collection of buildings around the ruins as an ensemble of architecture, based on Semper's theory of weaving in architecture. The collection of buildings as a fabric, in both plan and section, come together to create spaces, both light and dark in atmosphere, which are concurrently woven together and set apart from the bustling urban city fabric.

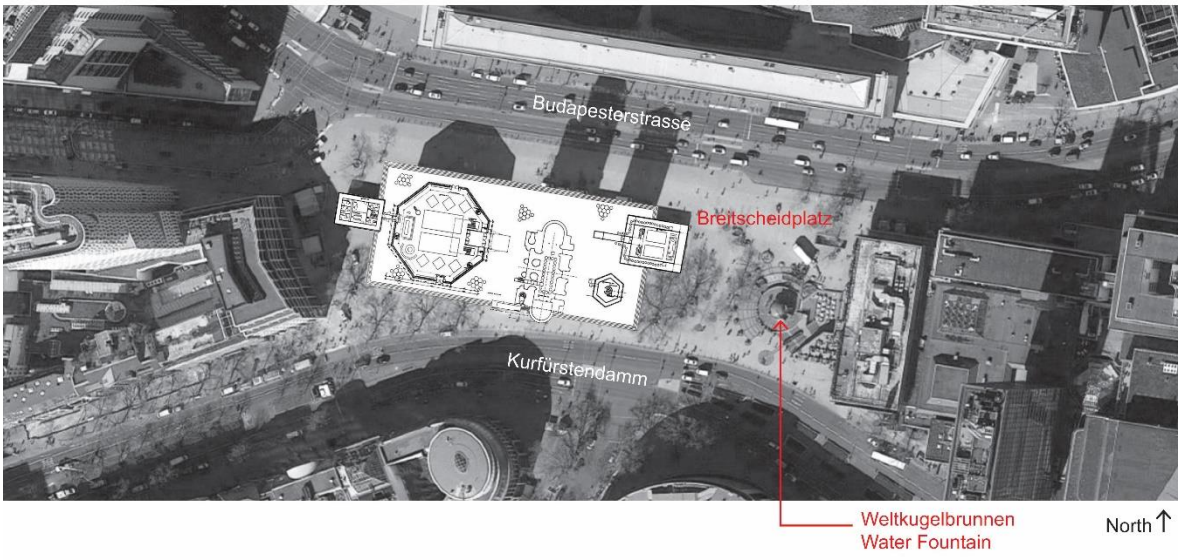


Fig. 1 Egon Eiermann, site map with plan overlay, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63.

Plan

The plan of Eiermann's intervention is an ensemble of buildings of multiple uses, composed around the preserved, bombed-out bell tower of the Neo-Romanesque church, which are both situated entirely and partially on top of the 100 by 40 meter raised platform. In the creation of public and intimate spaces on and around the plaza, this architecture is both woven together with and isolated from the urban fabric of the square and city around [Fig. 1]. This six-step raised plaza, laid with circular pavers of varying sizes among smaller, square cobblestones, sits within the street-level, rectangular paving stones of the larger Breitscheidplatz, sandwiched by Budapesterstrasse to the north, and The Kurfürstendamm, one of the most famous avenues in Berlin, to the south. This plaza and avenue mark the center of

what was West Berlin during the Cold War Era, now called the City West District [Fig. 1].[2]

In figure 1 we can see new church (1) is situated around the ruins of the first Kaiser Wilhelm Gedächtniskirche (2) on this plaza, octagonal in shape and 35 meters in total width. Behind this, farther to the east, and only partially on the raised platform, is the Foyer (3), which houses spaces for discussions, counseling, reading, and assembly. The Chapel (4) and the new Bell Tower (5), which rises to a height of 53 meters, coming short of the 71 meter remains of its destroyed counterpart, are across the plaza, on the other side of the ruined bell tower. [3] Early designs of this project reveal initial plans to house all of these spaces in one attached structure, but through Eiermanns decision to fulfill the spatial requirements of the new church with several different buildings, rather than one, he was able to create successful public spaces around the ruins of the existing church. In this decision, he facilitated spaces, interior and exterior, for gathering, recreation, and remembrance.

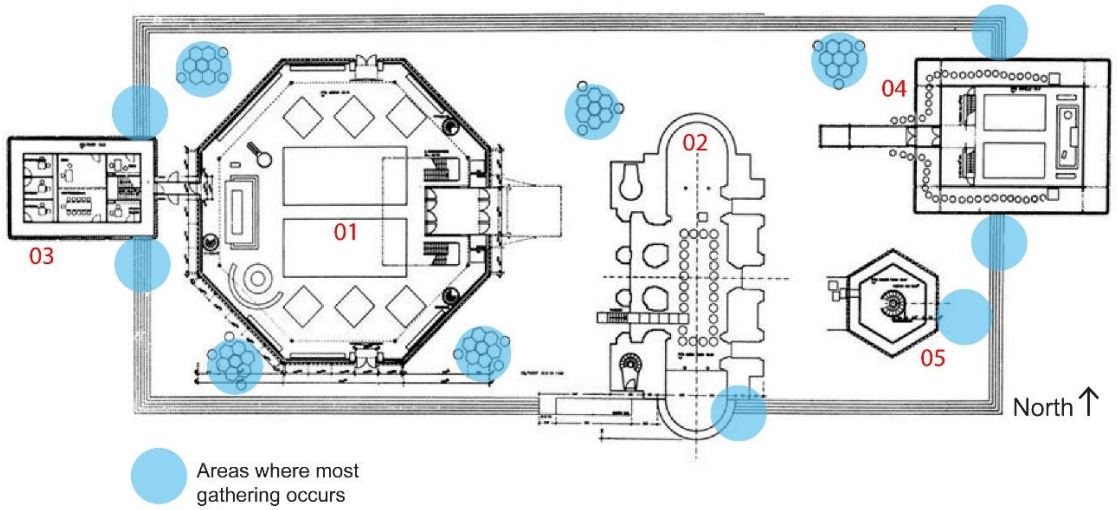


Fig. 2 Egon Eiermann, plan, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63

In between these busy shop-lined avenues, bustling with traffic and commerce, the plaza is an island of refuge for pedestrians - tourists and Berliners alike - offering to them a place to gather, relax, chat, and worship. The ensemble of buildings, new and old, creates many smaller, more intimate outdoor areas for these types of activities to be shared among friends, family, and strangers [Fig. 2].

These are seen around the raised plaza in the benches that encircle the trees that shade the stone surface of the plaza, and in the open areas where children are free to run around, playing chase or tag or games of the like. At the boundary of the raised plaza, the six steps that create the plinth offer their surfaces not only to visitors ascending, but also to those who are idly sitting and talking and enjoying the fresh air [Fig. 4]. The most popular gathering locations are where the steps of the raised plaza touch the building walls and around the four subway vents which are arranged on the plinth surrounded by built up hexagonal seating arrangements which disguise the vents as areas for social interaction [Fig. 5]. It is in these spatial types, ones which provide for the visitor the feeling of intimacy amongst the rich and busy urban environment, which Eiermann utilizes in the weaving of the site with the urban fabric.

Fig. 3 Egon Eiermann, The Chapel, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63

Fig. 4 Egon Eiermann, gathering on steps, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63

Fig. 5 Egon Eiermann, new church beyond the ruins on the plaza, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63

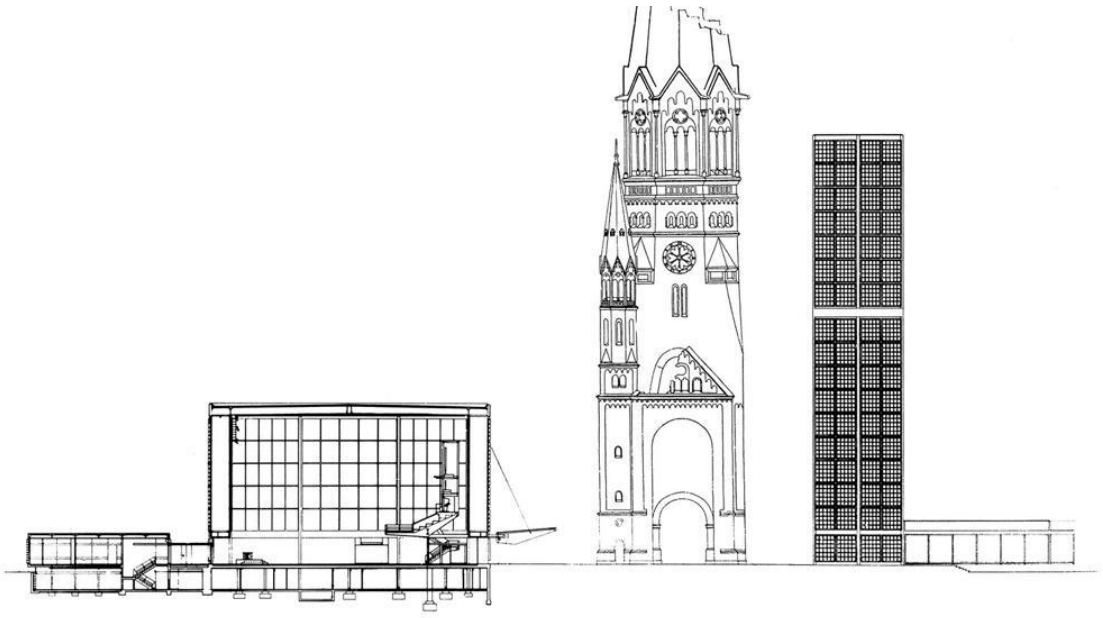


Fig. 6 Egon Eiermann, section through ensemble, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63

Sectional Quality

The architecture that is arranged around this raised plaza in the public square does more than create spaces for gathering, it also presents to the visitor a series of subtle sensory and perceptual changes as one meanders through the ensemble of the site and into the buildings. First coming from the busy avenues to the north or the south, or from the busy Europa Center mall to the east, a sense of relief from the summer heat is immediately felt when arriving under the cool tree canopies that scatter the street-level square. As one moves further through the plaza a feeling of disconnect from the surroundings begins to set in.

This is felt first when ascending the plinth for the project. Although not raised at a substantial height, the elevation and

difference in paving material and shapes, along with the towering ensemble of buildings, new and ruined, that contrast with each other and the buildings around the square, help to foster this perceptual separation.

Fig. 7 *Egon Eiermann, old and new church, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63*

Standing in the very center of the raised plaza, two very different buildings tower, framing the infinite blue sky, to the east and the west, one of a bombed out and seemingly unstable shell of the Neo-Romanesque ruin, and one of an ordered and clear façade of steel structure with concrete and stained-glass panels, respectively [Fig. 7]. The visitor would get the feeling of being very small here, and would almost be forced from this vertical openness, walled by these two very different structures, into a space beneath the suspended canopy of steel, attached to the façade of and marking the main entry to Eiermann's octagonal church [Fig. 8].

This canopy, though light in material and construction, presents to the visitor a sense of heaviness in suspension and compression. Below it, the plaza surface material is without change except for the replacing of the square cobblestones that surround the concrete circles with smaller ceramic ones, and it is felt as a new and entirely different space as that which surrounds, neither inside or outside, and a space which begs for movement. And movement is kept as the visitor goes forward from the protection of the canopy, over the threshold of the church defined by a heavy steel door over ventilation grates that delineate the surfaces of the floor of the plaza and the floor of the church, progressing to a composition of floor surface on which the large concrete pavers have been all replaced by varying sizes of the glazed and unglazed circular ceramic tiles.

Fig. 8 Egon Eiermann, entry canopy, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63

This entry vestibule, as the heavy door eases closed behind, is a stark contrast to both the open sky and the hoovering canopy behind; flickering candles lit, and dim lights recessed in circular cans in the low and dark ceiling do little to lighten this heavy space. As another heavy door along that same entry axis is opened, piercing blue

light bathes the room around, and the visitor is urged forward still, with the want to find its source.

Through that next set of heavy doors, expected is a release of this compression that has been building up since passing under the entry canopy, but instead encountered is another low, dark plane, jutting out in cantilever and obscuring the full view of what is ahead and above. What is seen, though, and drawing the visitor along this procession, is a huge bronze sculpture of Jesus, seemingly floating in midair with no support from above or below [Fig. 9]. The glowing statue, measuring 4.60 m in height, is a piece of art set against a background which is the source of the blue light that now shines on and gives everything a soft glow. [4] The light is piercing through walls of the same makeup as those of the exterior; exposed steel framework around prefab concrete panels in which honeycomb like voids are fitted with small stained-glass pieces [Fig. 11].

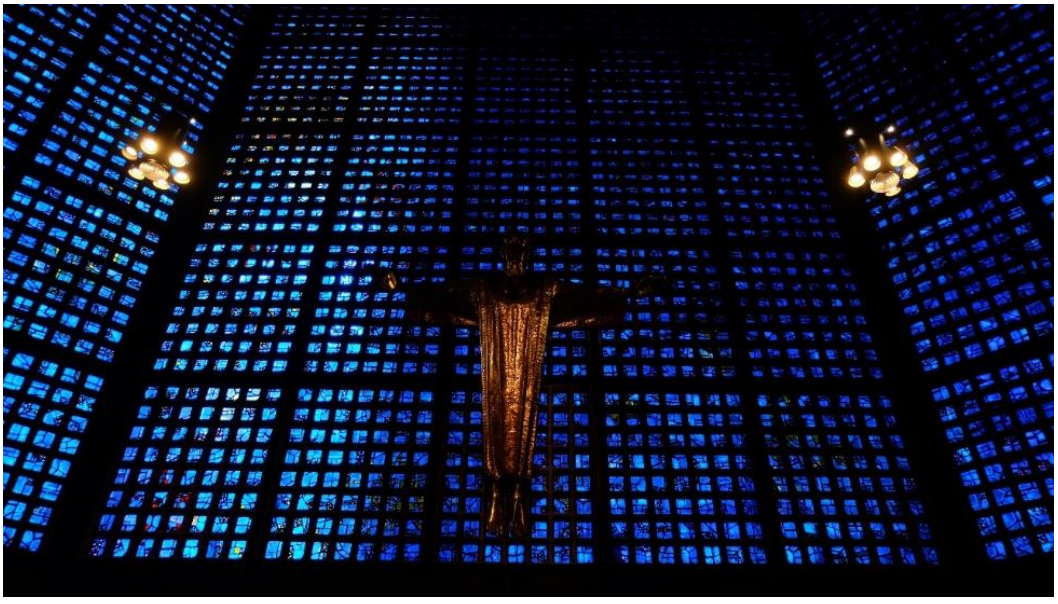


Fig. 9 Egon Eiermann, Jesus suspended, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63

Fig. 10 Egon Eiermann, interior showing organ, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63

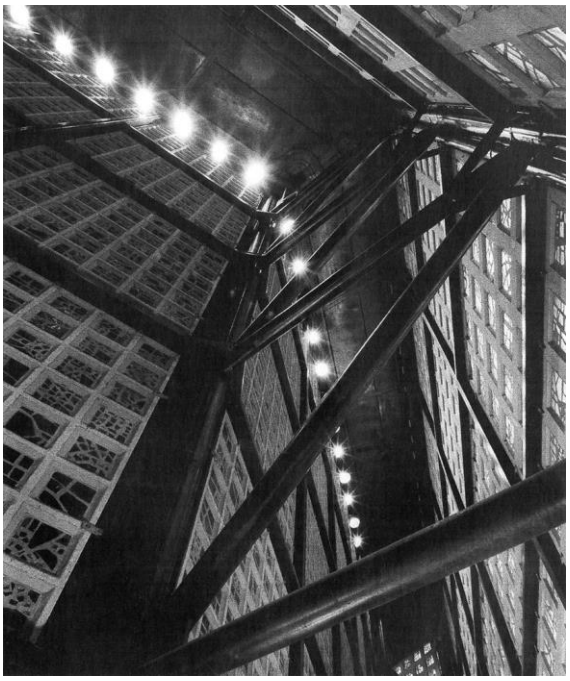
Moving from underneath the cantilevered plane, it is apparent that those walls, with their blue glowing glass, complete the form of the octagon on all sides. Behind, supported on the cantilever, is a massive organ that sits above the entry vestibule [Fig. 10]. From the floor of multi-colored and sized ceramic tiles, upon which chairs, designed by Eiermann himself, sit in rows facing the statue of Jesus and the heavy stone altar below, these walls rise on all sides, past dim yellow lights, suspended in the darkness.[5]

This ceiling is seen from below as a simple octagon of blackness, and its termination can only be guessed. As the blue sky outside is all light, this interior sky is all dark, calling attention away from it, forwards and around, to Jesus, backlit by the sky-blue light.

Fig. 11 Egon Eiermann, honeycomb panels with glass, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63

Enclosure

These towering walls of blue seem from the inside to be the same walls that tower on the outside; their structure and fill of the same materials and position, blue glass with speckles of green and yellow and red filling the honeycomb like voids within the concrete panels. The blue light appears to be natural light, filtered through these walls, but there is actually a 2.15-meter cavity creating a double wall thickness for artificial lighting to shine through the colored glass on both the interior and exterior walls, presenting to the viewer a striking façade internally and externally [Fig. 12].[6]



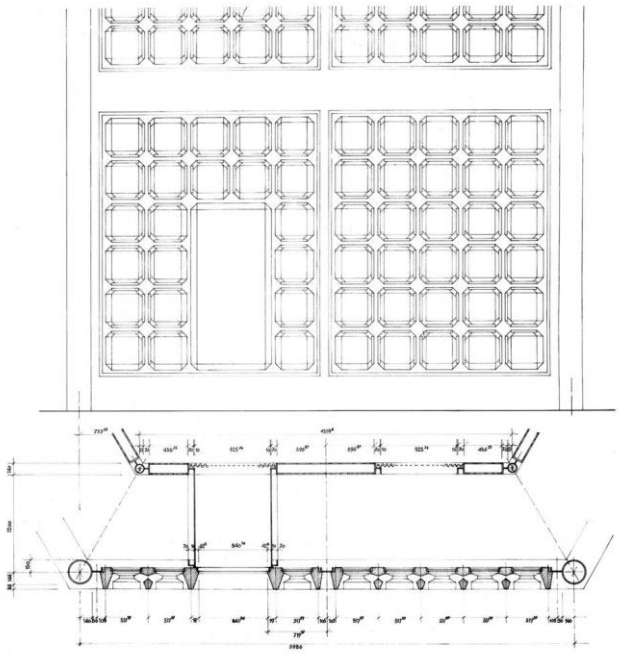


Fig. 12 & 13 Egon Eiermann, double wall system, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63. Photo and drawing from Artstor.

Observation of this double wall system which is employed by Eiermann in the perimeter of the octagonal church structure leads to the observation of his philosophical position of architecture for the project. Upon first glance, one might believe that the architect is taking up a position sympathetic to that of the eighteenth century Abbé Marc-Antoine Laugier in his 1753 *Essai sur l'Architecture*. In this treatise, Laugier outlines firstly his opinion on the ideal and general principles of architecture, which are derived from and owe all credit to the Greeks.[7] These general principles or elements that create beautiful architecture, according to Laugier, are the "…columns, a ceiling or entablature and a roof forming at both ends what is called a pediment."[8] This clear expression of structure and honesty in architecture without the unnecessary addition of ornament is something which was taken up by architects who were influenced by

Laugier, such as Karl Shinkle and Mies Van der Rohe, both of whom Eiermann certainly admired.[9]

The Kaiser Wilhelm Gedächtniskirche appears to demonstrate this theoretical position, but Eiermann is engaging in another theoretical argument, one asserted by the architect Gottfried Semper in his 1851 essay called "The Four Elements of Architecture." Semper, who wrote extensively about the origin of architecture and placed importance on a rational interpretation of construction techniques as a source of style, claimed that the architect should look back to the *Urzustande* (original state), or the primitive, in his treatise, but his principle elements of architecture became one central around which three others were grouped. These are the hearth (central), which he proposes is "the *moral* element of architecture", the roof, the enclosure, and the mound.[10] We see these elements in clear formation in the realization of this church; it is simple in its construction, a structure of steel columns and beams which support its enclosure of prefabricated concrete panels and its roof, built up on a mound which is the plinth of the plaza, and providing protection for its 'hearth', the moral element of the architecture- its sanctuary.

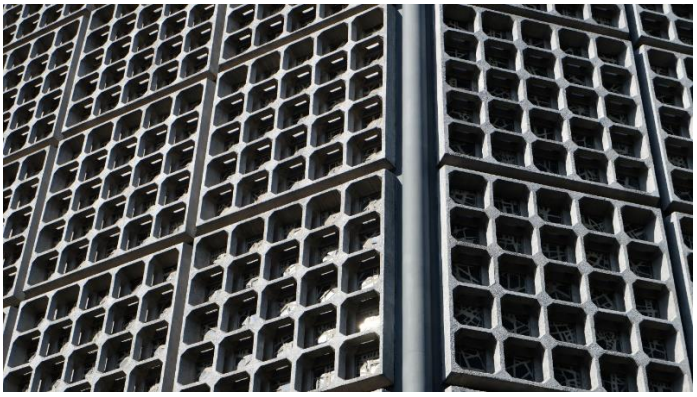


Fig. 13 Egon Eiermann, enclosure - exterior view, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63

The difference of priority to notice in the analyzation of this piece of architecture that forces the participant of analysis to interpret this building in Semperian terms rather than Laugerian, is the focus shift from structure (column) of Laugier, to that of enclosure (wall) with Semper.[11] In Semperian terms, the wall, derived from the primitive art of the wall-fitter (the weaver of matts and carpets), in its true essence is simply a vertical means of protection which acts formally as a visible boundary of space.[12] Here in the Kaiser Wilhelm Gedächtniskirche the wall is differentiated from the structure in these terms of enclosure, as a means of protection, spatial bounding, and for the skillful production of architectural effect.[13]

Fig. 14 Egon Eiermann, structure of the new church during construciton, Kaiser Wilhelm Memorial Church, Berlin, Germany, 1959-63. Photo from Artstor

The structure of the enclosures, composed of a steel frame [Fig. 14], is woven together with the prefabricated concrete and glass panel systems [Fig. 13]. The double wall system is woven together with the

connections of the structure of the ceiling, and at each of the eight corners by diagonal steel beams. In utilizing this way of building with this double wall system, Eiermann has created a space around the hearth (worship space) that is both protected and isolated in activity and sacredness from the bustling plaza and city around, and cordoned off in a reverent solitude. Though, because of the plaza around, which is weaved with the city, this sacred space becomes vital to the fabric of Berlin.

It is in these terms which we can understand the connection of the Semperian theory from which Eiermann derived his design principles of weaving in both the structure of the new buildings and in the public spaces and plaza around. The enclosures of the church, foyer, chapel, and bell tower define not only the spaces of the interiors, but also the exterior spaces of assembly which allow for congregation. This allows for the whole ensemble of spaces to be woven together with urban and social fabric of the square and city around.

Endnotes

[1] The Editors of Encyclopædia Britannica, "Gottfried Semper," Encyclopædia Britannica, October 13, 2009, , accessed December 16, 2017, https://www.britannica.com/biography/Gottfried-Semper.

[2] Thomas De Monchaux, "A Beacon in Berlin." The New Yorker. January 5, 2017. Accessed November 28, 2017. https://www.newyorker.com/culture/culture-desk/a-beacon-in-berlin.

[3] Ibid.

[4] "Facts about the church," Evangelische Kaiser-Wilhelm-Gedächtnis-Kirchengemeinde Berlin, accessed December 06, 2017, http://www.gedaechtniskirche-berlin.de/facts-about-church.

[5] Michael Petersen, "Egon Eiermann - New Chairs for New Churches. The SE 119 and SE 121." Smow Design . December 19, 2011. Accessed December 07, 2017. https://www.smow.com/blog/2011/12/egon-eiermann-new-chairs-for-new-churches-the-se-119-and-se-121/.

[6] Immo Boyken, "Ludwig Mies Van Der Rohe and Egon Eiermann: The Dictate of Order," (*Journal of the Society of Architectural Historians* 49, no. 2 1990), 153.

[7] Marc-Antoine Laugier, An Essay on Architecture. Translated by Wolfgang Herrmann and Anni Herrmann. Los Angeles: Hennessey & Ingalls, 1977, 12.

[8] Ibid.

[9] Immo Boyken, "Ludwig Mies Van Der Rohe and Egon Eiermann: The Dictate of Order," *Journal of the Society of Architectural Historians* 49, no. 2 (1990): 134.

[10] Gottfried Semper, The four elements of architecture: and Other Writings. Trans. Harry Mallgrave. (Cambridge: Cambridge Univ. Press, 1989), 102.

[11] Gottfried Semper, Style: Style in the Technical and Tectonic Arts ; or, Practical Aesthetics, trans. Harry Mallgrave (Los Angeles, CA: Getty Research Inst., 2007), 247.

[12] Semper, Gottfried. The four elements of architecture: and Other Writings. Translated by Harry Mallgrave. Cambridge: Cambridge Univ. Press, 1989, 102.

[13] Immo Boyken, "Ludwig Mies Van Der Rohe and Egon Eiermann: The Dictate of Order," (*Journal of the Society of Architectural Historians* 49, no. 2 1990), 153.

Notre Dame du Haut (1950-1954), Le Corbusier

> *"Paintings were painted… which were potential sculpture… But where does sculpture begin, where does painting begin, where does architecture begin?"* [1] Le Corbusier

Le Corbusier (1887 – 1965), known across the world for his poetic architecture, was also a prolific painter and sculptor throughout his life. Towards the end of his Purist Period, 1918 – 1925, the artist began a strict routine of "disinterested work", where he would paint regularly for at least five hours a day.[2] His goal in painting was to understand his architecture.[3] The quote above, from the personal notebooks of Le Corbusier, begins to highlight both his ruminations on the intersections between painting, sculpture, and architecture, and his desire to find a synthesis between the artforms.[4] He achieved this synthesis in the Chapelle Notre Dame du Haut, in Ronchamp, France.

Corbusier often cited the three 'major arts' as painting, sculpture, and architecture, eventually coming to understand sculpture as a means to create a dialogue between his painting and his architecture.[5] In 1946, he began collaborating with the Breton cabinet maker Joseph Savina, sending him large drawings that were to be made into wooden sculptures. Soon, a dialogue was created, and the architect was able to, through understandings of the interactions of the sculptures with the space around them, further solidify his ideas of architecture in relation to painting and sculpture.[6]

In the summer of 1950, at the recommendation of the Secretary of the Besancon *Commission d'Arte Sacre*, Canon Ladeur, Le Corbusier was given the commission for a new chapel on pilgrimage site in Ronchamp, France, where the previous church was destroyed during WWII.[7] It is through his intervention atop this hill that Le Corbusier was able to find the synthesis between architecture and sculpture. The sculpture of the project are two types: chiseled and assembled, and can be understood by first observing the sculpture of Constantin Brâncuși (1876 – 1957) and Marcel Duchamp (1887 – 1968), whom Corbusier would have certainly been influenced by and quite possibly even known. These two sculptures made their careers in France, and developed two different schools of thought in relation to the production of sculpture; Brâncuși preferred sculpture created by a means of chiseling away from and existing material - in the subtractive method [Fig. 1], and Duchamp created sculpture from assembly, in the combination of found objects - in the additive method [Fig. 2]. In the creation of his architecture at Ronchamp, Le Corbusier employed the marriage of these two methods of sculpting.

Fig. 1 (left) Constantin Brâncuși, chiseled sculpture, Mademoiselle Pogany I, 1912. Photo from Artstor

Fig. 2 (right) Marcel Duchamp, assembled sculpture, Rou de Bicyclette, 1913. Photo from Artstor

Fig. 1 Le Corbusier, interior view, Notre Dame du Haut, France, 1954

> *Architecture, sculpture, and painting are specifically dependent on space, bound to the necessity of controlling space, each by its own appropriate means. The essential thing that will be said here is that the release of aesthetic emotion is a special function of space.*[8] - Le Corbusier

Sculpture of Spaces

The synthesis of sculpture and architecture in Le Corbusier's Notre Dame du Haut can first be seen in the sculptural arrangement of spaces in the church, in which an altar, a choir and nave, a sacristy, confessionals, three smaller chapels, and an exterior altar, pulpit, and memorial for the dead are contained. These spaces seem to be formed from the carving and subtraction of an object which was whole before, its new voids become spaces of aesthetic emotion for a sacred function. In their arrangement and composition, the spaces in the plan can be seen as a painting of Corbusier's which was subsequently, through architecture, realized as sculpture.

Fig. 2 Le Corbusier, main entry, Notre Dame du Haut, France, 1954

Fig. 3 Le Corbusier, south side chapel looking out, Notre Dame du Haut, France, 1954

Fig. 4 Le Corbusier, south side chapel looking up, Notre Dame du Haut, France, 1954

Approaching the clearing after ascending the pilgrimage trail, the visitor is automatically struck by the power of the church, perched on the hill as its base [Fig. 8]. Where the path followed turns from the black asphalt to tan stone pavers, a large door of sheet steel onto which Corbusier painted an enameled mural is confronted first [Fig. 4]. This door is set back, below a plane of board formed concrete, from the sweeping wall of whitewashed plaster over stone on its right, and the towering monolithic form on its right, into its own space.[9] Through the main entry way, the smooth pavers of the path continue into the congregational space, where the floor surface becomes a gridded concrete that follows the gentle slope of the hilltop. Underneath the sweeping concrete roof, a low stone platform with wood insets is placed on the natural slope, and provides

the base for eight congregational benches, facing east towards a statue of Mary.

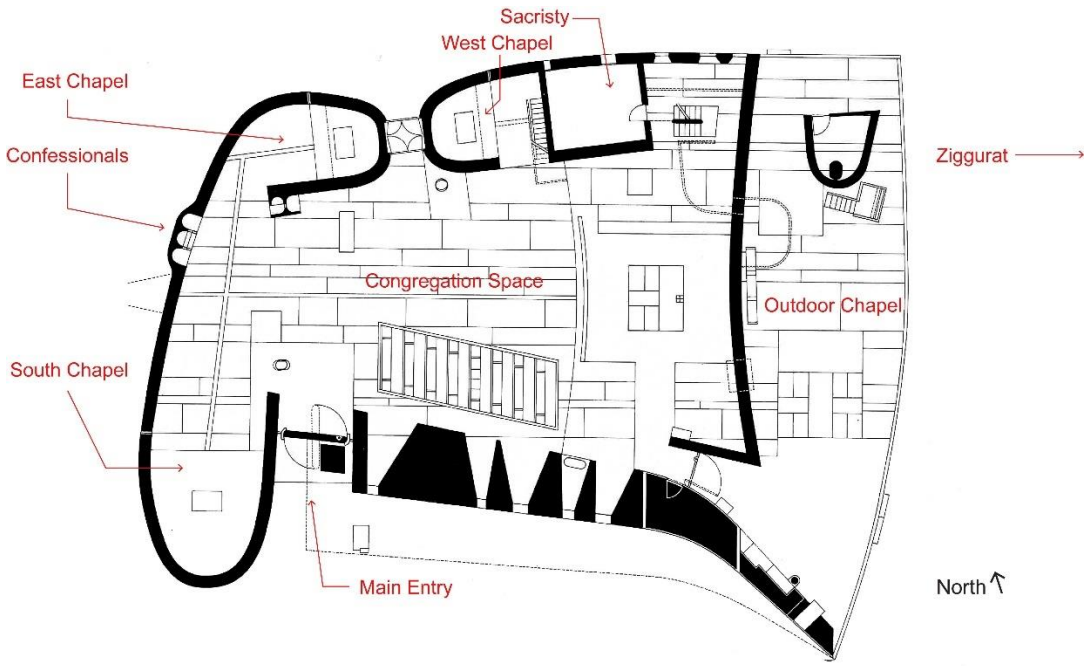


Fig. 5 Le Corbusier, south side chapel looking out, Notre Dame du Haut, France, 1954

To the other side of the entry, flanking the lowest portion of the curving ceiling, the floor is also of raised stone pavers, marking the sanctity of the altars which are placed on top of them, bathed in light that enters in from the cavernous towers in which these chapels are placed [Fig. 5-6]. Along this back wall, which curves to connect the east and south chapels, voids are set into its thickness, forming the confessionals [Fig. 7].

Back towards the east, a void is formed too at the end of the chapel, raised from the natural slope on a stone surface. This whole space, from east to west, seems to be spilling out, from the north and south entries to the west. This sculptural volume of space is accentuated by the curves of the walls which part behind the

chapel, the cavernous roof that reaches its full height above this opening, and the line of light which spills in from the small space between this roof and the massive walls. The floorplan [Fig. 7], in its unusual form, is evidence of how Corbusier began to sculpt these spaces.

Further supporting the claim of the Notre Dame du Haut being the realization of Le Corbusier's aims to synthesize architecture and sculpture are the elements of architecture and furnishings which come together to form the spaces of sculpture described above. These elements are a combination of the two methods which the sculptor utilizes to create his artwork; chiseling and assembly, or subtraction and addition, respectively.

Chiseled Sculpture

Fig. 6 Le Corbusier, view from approach, Notre Dame du Haut, France, 1954

At Ronchamp, the architect first engages in carving of the sculpture to create his chapel, beginning with some existing material present atop the hill. The raw material from which masses are being

subtracted is not stone or clay, it is not even tangible, but is a conception from an essence of the landscape which can be found there still today.

> One begins with the acoustics of the landscape, taking as a starting point the four horizons. These are, the plain of Saône, opposite it the hills of Alsace, and on the other side two valleys. The design is conceived in conformity with these two horizons in acceptance of them.[10] - Le Corbusier

The existing material from which Corbusier found his architecture, his sculpture, is seen here as the essence of the landscape. It first, and most notably, reaches its materialization in the massive whitewashed walls of the project, which look as if they were carved from a huge white stone [Fig. 9]. These thick white walls form the vertical shell and enclosure of the building, curving graciously around the plan, and, at three points, reaching upwards where further removal forms the light shafts in the towers, high above the more intimate chapel spaces.

Fig. 7 Le Corbusier, south wall, Notre Dame du Haut, France, 1954

Fig. 8 Le Corbusier, exterior chapel, Notre Dame du Haut, France, 1954

Subtracted further from the walls at locations ordered through rationale deriving from Le Corbusier's Modular system, are voids of different sizes and angular direction, forming deep recesses for windows [Fig. 9].[11] At three points along the perimeter of the building- on the north, south, and east walls- the material of whitewashed stone has been chiseled away entirely, both disconnecting the monolithic forms and creating a slit of vertical emphasis to house the three separate entrances.

The entry to the east, formed from this division of the massive wall which now looks as if it is sweeping away to facilitate movement, leads from the interior altar space, outward, where a stage has been formed from the subtraction of a large mass, now open under the apex of the curving roof [Fig. 10]. This void in space creates the exterior chapel porch, available for use by large masses of pilgrims to the site [Fig. 11]. A few pieces remain as evidence of the chiseling that occurred; the curving wall, standing by itself on the north end of the

stage and creating a small outdoor storage space, wraps around concrete column and stops short of its full height, revealing the bearing point for the weight of the roof. Another remnant is the balcony, which mirrors the one on the interior, and protrudes from the east wall, whose material it shares.

Further carved from this space are voids of smaller size on the east wall, scattered like stars in the sky, the door that provides access for both the interior and exterior balconies, and the large square that provides housing for the sculpture of Mary [Fig. 11]. On the chapel side of the south wall, which sweeps away from the large opening for the door, a built-in shelf is carved near the base, providing surface to rest items that the priest would use to facilitate rites of sacrament.

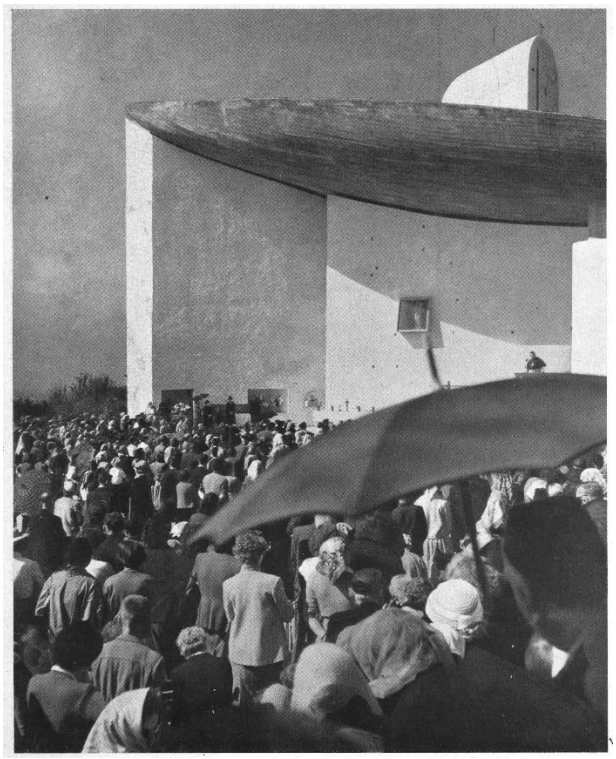


Fig. 9 Le Corbusier, pilgrimage mass, Mary visible in the wall, Notre Dame du Haut, France, 1954. Photo from Artstor.

On the carved interior space of the church, we see chiseled sculptural element in the furnishing present on the congregational floor and on the platform of the altar. These elements are the stone fonts at both the north and south entrances, the wood and concrete congregational benches, the short railing that sits upon four supports of steel on the edge of the raised platform of the soleas, and the wooden cross, which stands in odd proportion behind the stone altar. These however, must be talked about in observation through another lens, one taken from Duchamp that analyzes sculpture as an assembly of parts rather than sculpture that has been chiseled. While all of the aforementioned objects were formed by the subtractive action of chiseling, they were sculpted from materials different than the plastered walls, they are elements that were additions to the site and to the church, not remnants of the subtraction that first took place from the essence of the site.

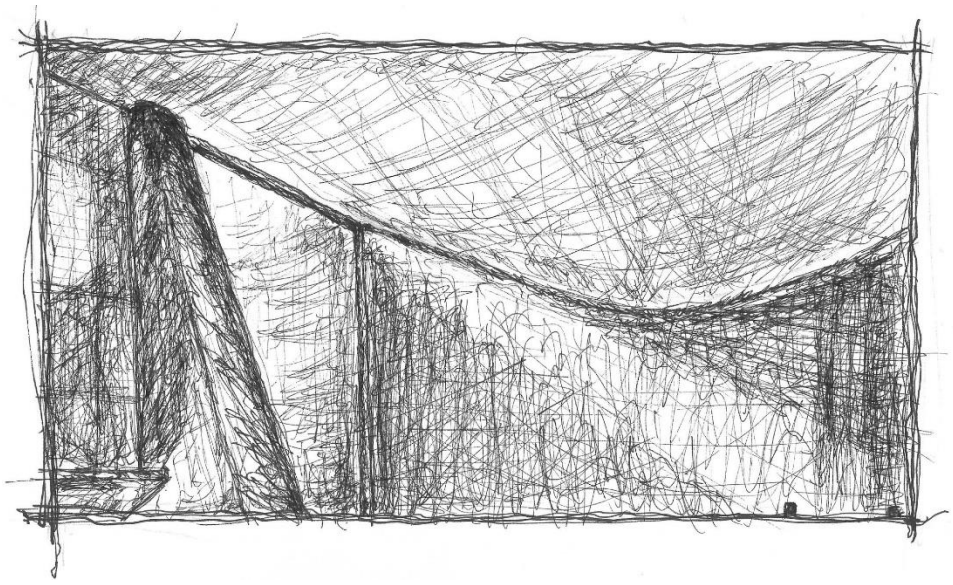


Fig. 10 Le Corbusier, carved space, Notre Dame du Haut, France, 1954. Sketch by author.

Fig. 11 Le Corbusier and Joseph Savina, congregational benches, Notre Dame du Haut, France, 1954

Assembled Sculpture

We will begin talking about this type of sculpture, which is additive in nature as an assembly of found parts onto a base or platform, in the sculpture of the eight congregational benches, seated upon the platform of wooden tiles [Fig. 13]. These sculptures of wood and concrete are the only collaboration between Le Corbusier and the Breton cabinet maker Joseph Savina present in this chapel. Each bench is composed of two vertical concrete masses on either side which support three horizontal wooden members, providing surfaces for seating and kneeling, and one for both back support and shelving for hymnals. The short railing before the altar which these benches face is of similar form, but realized in curved steel, rather than in wood and concrete. Here, as in the sculpture of Duchamp, we see multiple materials coming together to create this assembly.

The smooth stone altar behind this railing is further raised from the platform of the soleas, which is of the same stone that marks the

entry locations on the naturally sloping congregational floor, onto a slightly higher stone base. It stands before a wooden crucifix into which is place a carved relief of Jesus. Above the stage, altar, and crucifix is a concrete cube placed in the largest void formed in the eastern wall, containing the statue of Mother Mary, to whom this church is dedicated [Fig. 16]. This cube is both a pedestal and a window, so Mary can be turned to face either the interior or exterior services.

Fig. 12 Le Corbusier, south wall with voids for windows, Notre Dame du Haut, France, 1954

The pulpit, raised from the surface of the floor, and protruding from the void carved that creates the entryway for the west side chapel, is of rough cast and board formed concrete, and floats in contrast to the stark white supporting wall. Standing here, the priest would be looking towards the congregation, seated in the benches, and the dramatic white wall on their right sides.

Perhaps displaying the highest drama present in the chapel, the angular voids that are cut through this wall [Fig. 14] are divided by painted glass and lead windows that bear the architect's original

designs. They are assembled with different arrangements of mullions and types of paintings; clouds, suns, moons, and stars. Aside this wall is the main entry, whose door also hosts paintings by Le Corbusier on either side and is assembled together with a large, sculptural handle [Fig. 4].

Through these doors and out, to the exterior of the chapel, elements of assembly are revealed through circulation around the building. The most striking of these is the sweeping roof of board formed concrete, which Le Corbusier explained to be modeled after a found crab shell.[12] As seen in the sculpture of Le Corbusier and Savina [Fig. 17], here too key components of this sculpture / architecture are connected not by flush joining, but by vertical rods. Here the elements are roof and wall, the rods as *pilotis* embedded in the structure of the wall, revealed only in the few centimeters that rise from the tops of these walls to support the roof [fig. 15], creating a seamless reveal that allows light into the interior spaces.

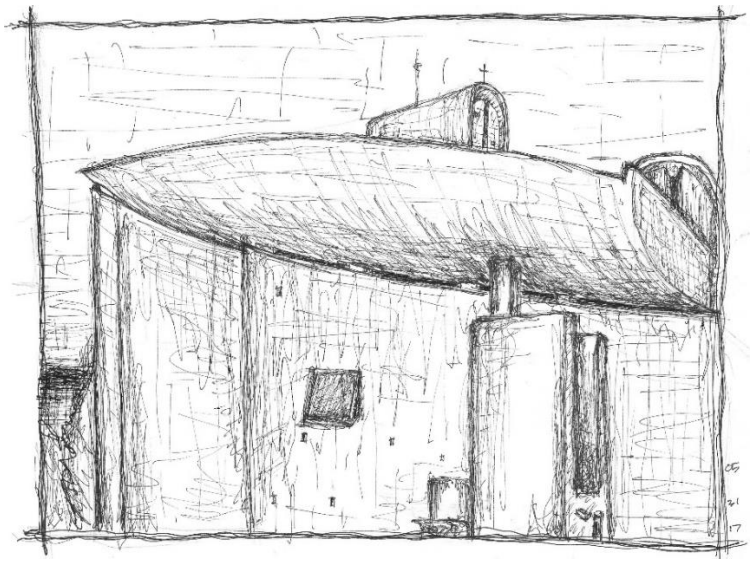


Fig. 13 Le Corbusier, east façade, reveal between the roof & walls appears darkest, Notre Dame du Haut, France, 1954. Sketch by author.

Objects are further assembled in the other pieces of raw, board formed concrete which come together as sculpture to punctuate the striking white of the carved walls. These are the pulpit for the exterior chapel, the column that rises to meet the roof from the unconnected white wall on the east porch, the staircase that ascends the north side, and the gargoyles which occur on two points of that massive roof [Fig. 19].

Fig. 16 Le Corbusier, statue of Mary and reveal between wal and roof, Notre Dame du Haut, France, 1954

Fig. 17 Le Corbusier and Joseph Savina, acoustic sculpture, wood and steel, 1952

Fig. 18 - 19 Le Corbusier,water basin and gargoyle, Notre Dame du Haut, France, 1954

The most striking occurrences of this gargoyle is in its double barrel realization on the east end of the chapel, where it is stretching over the protrusion caused by the carved space of the

confessionals [Fig. 19]. The water that flows from the roof and through this object would find rest in the water basin, also of board formed concrete, in which two triangles and one cylindrical form are also contained [Fig. 18]. This object of the basin and the forms within, because of its physical disconnection, may be seen as a sculpture within itself, but due to its arrangement in both composition and connection by function, it is further an assembly within the sculpture of the site.

The last major element of assembled sculpture found here is also one of physical disconnection but one of strong symbolic ties, and possibly the strongest that holds within our definition of found objects assembled. This element is the ziggurat [Fig. 20], which lies to the east, built at the start of the steep topographical decline of the hilltop. In sharp contrast with the architect's other interventions on this site, this pyramid of stone, which was constructed from the remains of the bombed church that was here before, is composed as a memorial to the dead.[13]

Fig. 20 Le Corbusier, ziggurat and raven sculpture, Notre Dame du Haut, France, 1954

Thus, the sculpture of the architecture of Notre Dame du Haut is composed, including elements of both the chiseled sculpture of Brâncuși and the assembled sculpture of Duchamp. In its realized composition as architecture, one can see clearly see both Le Corbusier's desire to find the synthesis of the three 'major arts' of painting, sculpture, and architecture, and his success in the realization of that desire.[14] The chapel becomes more than just architecture, it becomes a piece of art of multi-disciplines, which is placed on its sacred site on the hill of Ronchamp.

Endnotes

[1] Le Corbusier and Lucien Hervé, *Le Corbusier; as Artist, as Writer.* (Neuchatel, Switzerland: Editions du Griffon, 1970), 15.

[2] Le Corbusier and Martine Mathias, *Le Corbusier: Oeuvre Tissé.* (Paris: Philippe Sers, 1987).

[3] Jamie Coll, *Structure and Play in Le Corbusier's Art Works,* (AA Files, no. 31, 1996) 4.

[4] Le Corbusier and Lucien Hervé, *Le Corbusier; as Artist, as Writer.* (Neuchatel, Switzerland: Editions du Griffon, 1970), 17.

[5] Le Corbusier and Martine Mathias, *Le Corbusier: Oeuvre Tissé.* (Paris: Philippe Sers, 1987).

[6] Danièle Pauly, Le Corbusier: La Chapelle de Ronchamp. Paris: Fondation Le Corbusier, 1997, 36.

[7] Danièle Pauly, Le Corbusier: La Chapelle de Ronchamp. Paris: Fondation Le Corbusier, 1997, 58.

[8] Jamie Coll, *Structure and Play in Le Corbusier's Art Works,* (AA Files, no. 31, 1996) 9.

[9] Le Corbusier and W. Boesiger, *Oeuvre Complète*. Translated by William B. Gleckman. Vol. 6. 7 vols. (Zurich, Switzerland: Editions Girsberger, 1957), 40.

[10] Eugenia Bell and Ezra Stoller, The Chapel at Ronchamp. New York: Princeton Architectural Press, 1999.

[11] Danièle Pauly, Le Corbusier: La Chapelle de Ronchamp. Paris: Fondation Le Corbusier, 1997.

[12] Le Corbusier and Lucien Hervé, *Le Corbusier; as Artist, as Writer.* (Neuchatel, Switzerland: Editions du Griffon, 1970), 22.

[13] Danièle Pauly, Le Corbusier: La Chapelle de Ronchamp. Paris: Fondation Le Corbusier, 1997, 36.

[14] Le Corbusier and Martine Mathias, *Le Corbusier: Oeuvre Tissé*. (Paris: Philippe Sers, 1987).

Jatiyo Sangsag Bhaban (Bangladesh Parliament) 1962-1982, Louis I. Kahn

> It is a piece of work which has tremendously influence our architecture. Even outside Bangladesh. During the British rule we lost everything. This building has revived our sense of cultural identity. The whole complex – the way it deals with the climate, the spirit of the region has a local connotation for me. The problem of cost is a nonsense, because firstly you have to see the project in 1962, and secondly you have to examine it in the context of the whole economy of the country in the past 25 years. I know that we do not have democracy, but you see, the building is there. The aim is there.[1] Muzharul Islam

Muzharul Islam is the Bengali architect who brought his former teacher from Yale, Louis Kahn (1901-1974), into Bangladesh (then East Pakistan) to accept the commission for the National Parliament Building. He speaks to the success of this building through four kinds of cultural identity: climate, economy, politics, and spirit of the region, and this reaction typical of both local commoners and educated design leaders in the country.[2] This building is more than a parliament building; it is a mosque for a democratic government. As such, it was instrumental in reviving and grounding the Bengali peoples and culture once again in their religious and cultural roots.

I shall analyze and interpret the architectural features in the Parliament Building by comparing it to the historic mosques in Dhaka which Kahn most likely visited. Each analysis will be done according to the attributes identified by Muzharul Islam to explain how Kahn's design resonated so deeply with the Bengali people.

Politics

The political significance of the building lies in its connection to post-colonial rule and religious civil war for national identity. While this building currently serves as the National Parliament Building for Bangladesh, it was not designed for this independent nation, rather it was designed for the Pakistani people who lost control of the region following The Bangladesh Liberation War of 1971.[3]

The end of British colonization by the British East India Company saw the partitioning of the Indian Subcontinent, through the Indian Independence act of 1947, into the Nations of India and Pakistan, the latter having two separate geographical wings - West Pakistan (modern Pakistan) and East Pakistan (modern Bangladesh).[4] This relationship of the two parts of Pakistan was strained, being that the Bengali people were in the east and nationalist movements for restoring culture and language were being stirred.[5] It was in the interest of preserving these two wings of Pakistan under Pakistani rule that rose the idea of a second capitol in East Pakistan (the first being Islamabad)- specifically in Dhaka.[6]

The search for the architect of the second capitol building ensued and decided on Louis Kahn, who accepted the task. Ayub Khan, the military man who had come to power and instated this commission for the new parliament building, desired a monumental building that would solidify the Bengali people under his rule.[7] Kahn understood this, and founded his design principles for this project under the light of appropriation of the Bengali culture and traditions of Islam.

Understanding this is principle to understanding this building as symbolizing a mosque in the heart of the city.

The Liberation War of Bangladesh began in 1971 and delayed construction of Kahn's project, which was only to be completed in 1982 under a democratic Bangladesh.[8] This grounds the architecture even more into the country and the culture which resides there, showing how his appropriations were cultural, rather than political, thus the initial political associations were inconsequential to the design and realization of the architecture.

In Bangladesh, Muslims constitute over 90% of the population, thus the mosque is the house of order for the nation people; the house around which people gather in community and family, and from where moral and spiritual guidance is derived.[9] The same is true for the National Parliament Building. Upon my arrival to its entry gate, I was denied access despite prior reservations due to a destabilizing political climate and recent security threats which barred the building from outside access. These unfortunate circumstances thus compelled me to study the mosques in Dhaka. Ironically, the turn of events made me see Kahn's project through a lens of Muslim culture, rather than as a student of Kahn.

Fig. 1 . Louis Kahn, view of south façade from the fence, Bangladesh Parliament Building, Dhaka, Bangladesh, 1962.

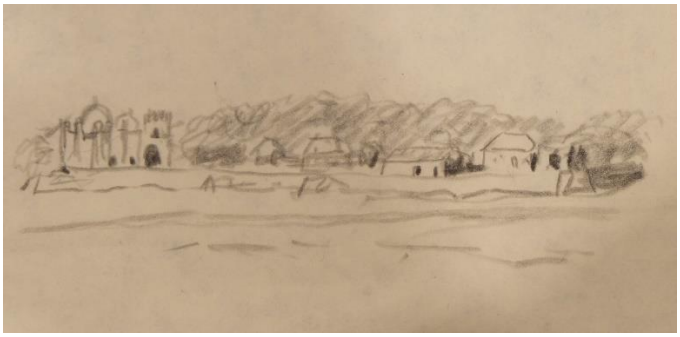


Fig. 2 & 4. Louis Kahn, preliminary sketches from first trip to Dhaka, river scene with Islamic architecture in the background, The Louis I. Kahn Collection at the Architectural Archives, University of Pennsylvania, photos by author.

Fig. 4. Modern river scene, Dhaka, Bangladesh, June 2017, photo by author.

CLIMATE

Bangladesh is situated on the Ganges Delta, the largest river delta in the world. The mouths of the Ganges and Brahmaputra rivers pass directly through Dhaka.[10] This topography together with the monsoon seasons and harsh sun of Southeast Asia make it a place with

violent weather and severe climactic conditions; intense wind and rain, flooding, tornados, and humidity with an overbearing sun.

The vernacular architecture of this region has many design strategies to protect the buildings and inhabitants from these severe conditions. From the shacks to the mosques, forts, and palaces, strategies that exist historically and today include: rain screens, large recesses for porches, and low and sloping canopies which both keep out rain and provide shade and ventilation, wall construction in clay with few windows occurring, and building upon mounds above the flood levels.[11] It is from these elements that Kahn likely formulated his own strategies which present themselves in the geometric forms of the façade [Fig. 5].

The dramatic display of geometry with the circles, rectangles, and triangles carved from the exterior walls are evidence of Kahn's strategies employed to create a solution for these climactic conditions; they are the realization of the 'double wall' system that he came up with when designing for the American consulate project in Luanda, Angola, and serve to create large recesses of space between the outer and inner structure.[12] In both Luanda and Dhaka these outer walls and their voids protect the interior curtain walls of the offices and halls from the sun, rain, and monsoons while also allowing for multiple courtyards in recesses to be situated along the perimeter of the building.

These towering concrete walls, reminiscent of the walls of Islam fort and mosque architecture, meet their shimmering reflections as

they come to their end where a large body of water begins [Fig. 5].[13] This manmade reservoir, like pools incorporated in and around mosques [Fig. 6], is called Sangshad Bhaban Lake and surrounds the building almost in its entirety.

Fig. 5. Louis Kahn, geometric facade with double wall system, Bangladesh Parliament Building, Dhaka, Bangladesh, 1962. Photo by Carter Cumbie

Fig. 6. Subahdar Muhammad Azam Shah, reflection pool, mound, recessed entrances, Lalbag Fort Mosque, Dhaka, Bangladesh, 1678 AD.

From the South Plaza to the southern entry, one crosses a bridge that spans over the lake, creating a physical and symbolic connection of the everyday to a higher purpose; a bridge between the sacred and the profane. In echoing both the rivers and wetlands of Dhaka and formally tying to Islamic mosques and palaces, the lake below acts as a retention pool to control flooding. The lake serves its purpose in a cyclical fashion - as the rains fall it captures the waters that are prone to flooding this region, and then, as the monsoons cease, the water contained in the lake evaporates, cooling the buildings and their courtyards that surround. The construction of the lake, through its excavation, also provides the material for the creation of the mounds that are used, as in mosques in the region, to elevate the buildings above the delta flood plains.[14]

Mounds, pools, evaporative cooling, and double walls are all techniques Kahn employed in the Parliamant Building that are not only practical, but are part of familiar techniques for significant buildings, especially mosques, in Dhaka. His response to climate and ability to reimagine familiar techniques showed sensitivity to Islamic Culture.

Economy

The use of economy here references the word's origin in Greek, 'οἰκονόμος', is derived from both 'οἰκο' (house) and 'νέμω' (management or order). A literal translation of the word 'Order of the House' can describe the order of Kahn's Parliament building and how

the spaces and rooms are arranged in relation to each other compared to Dhaka's historic mosques.

Just as the mosque is central in the religious order of the Bengali people, the parliament building is central in the political order of a nation. The emphasis placed on the axial disruption in the arrangement of the prayer hall to the rest of the assembly building [Fig. 7] indicates Kahn's design parallels between his Assembly and the architecture of mosques.

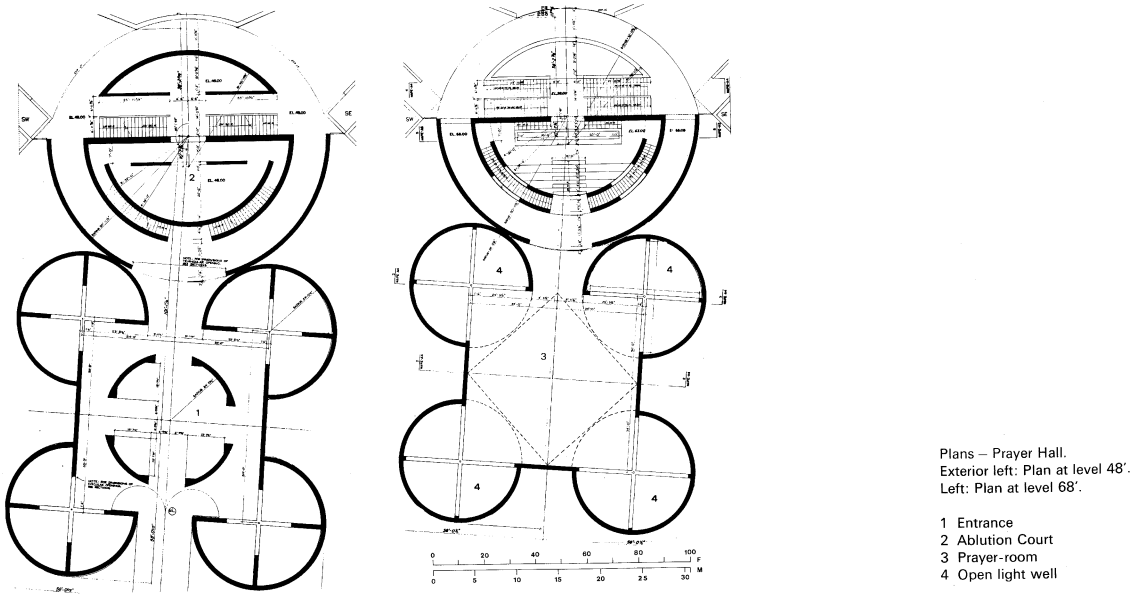


Fig. 7. Louis Kahn, plan of prayer hall, showing axial disruption, Bangladesh Parliament Building, Dhaka, Bangladesh, 1962.

After crossing a bridge there is a sudden change in axial arrangement; the north/south path that was followed from entry into the gardens of the assembly and onto the plaza has now been disrupted, and the visitor travels at a slight angle when approaching this southern entry.

The southern entrance of the Parliament Building leads into the wing of the Prayer Hall which, like the bridge followed for entry, is also tilted slightly off axis [Fig. 7]. It is here that a design idea begins to become clear. Once again, the structure, even to the unfamiliar visitor, is reminiscent of ancient Islamic, especially mosques.[15] To any Muslim or native of this part of the world, this move of tilting the southern portion of the building that contains the prayer hall off of its north / south axis (which itself is a western method of planning) may seem like an obvious one and its boldness may be given little thought; the qibla (direction of Mecca, the holy city of Islam) must be faced during daily prayer.[16]

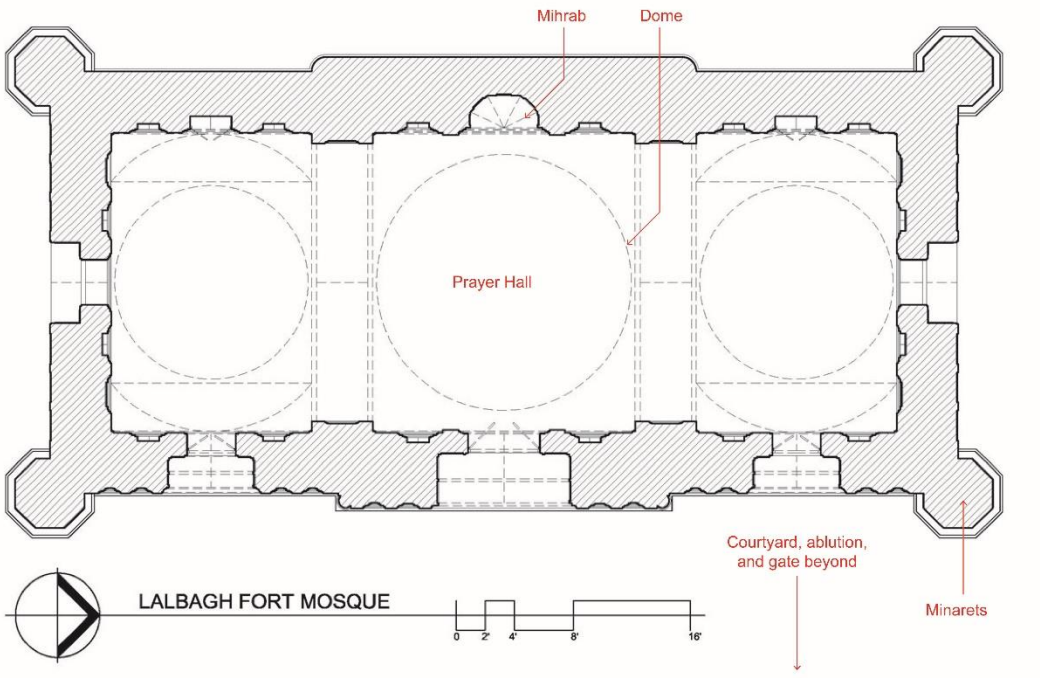


Fig. 8. Subahdar Muhammad Azam Shah, plan, Lalbag Fort Mosque, Dhaka, Bangladesh, 1678 AD.

A mosque is made up of distinct formal elements and spaces, among these are: a minaret (a tower attached to a mosque from which a

muezzin calls Muslims to prayer), a dome, a prayer hall, a mihrab (the semi-circular indentation of the wall of the prayer room that marks the qibla), a minbar (the raised platform from which sermons are given), an ablution area, and a courtyard with a main entry gate (Fig. 8).[17] All of these elements are experienced in symbolic representation throughout the parliament building, and a few of them have been discussed already: we can equate the entry of the Citadel of the Assembly to an entry gate with the south plaza representing the courtyard, and the Prayer Hall on the southern wing as the quibla which is responsible for its axial disruption.

The sequence of spaces to reach the Prayer Hall in particular will lend some light on the other features of the Parliament Building that symbolically represent a mosque. Shortly past the entry hall is the complex's ablution chambers, where Muslims cleanse themselves before entering the sacred space of the Prayer Hall [Fig. 7]. The space is housed between a set of curved stairs in the semi-circular unit that serves as the pivot point for the rest of the prayer hall wing, allowing it to be turned from the western axis. The ablution chamber is set at an intermediary level, a space of compression in between the natural light of the ambulatory and open solitude of the Prayer Hall, within this stair, neither on level with the entry or the Prayer Hall floor - neither on level with the profane nor the sacred [Fig. 10]. This distinction of space gives to the Muslim a clear mindset of preparation for prayer. Once cleansed, the procession is continued up into the space of the Prayer Hall.

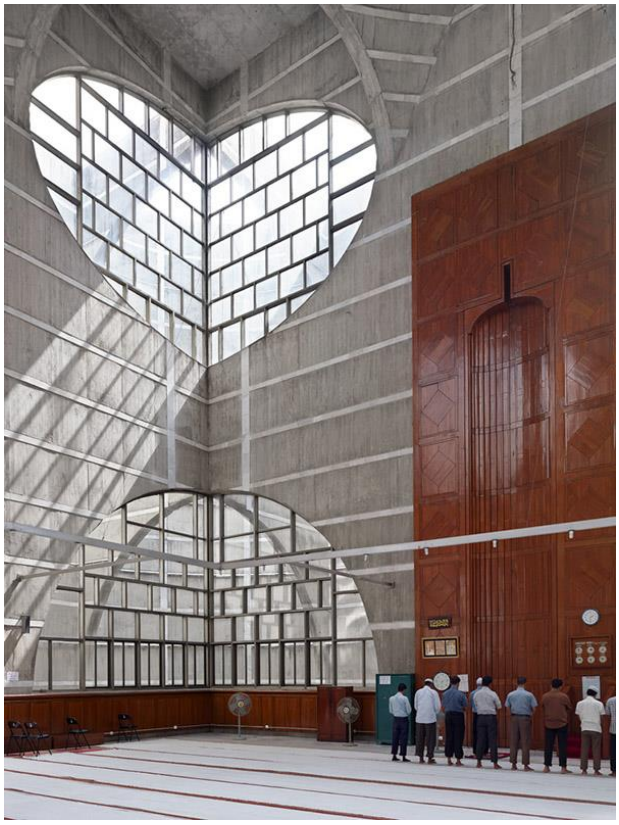


Fig. 9. Louis Kahn, prayer hall interior, Bangladesh Parliament Building, Dhaka, Bangladesh, 1962. Photo by Carter Cumbie.

First noticed in the Prayer Hall are the towering walls of the same material and striation of the exterior, which carry the ceiling up from the floor to a height of seventy feet [Fig. 9]. This floor is a gridded marble surface, and the rectilinear grids appear to match the size of the prayer rugs which are scattered about. On each corner of the square space there are two semi-circular voids cut from the walls which reveal Kahn's light wells - connected towers at each corner of the wing that are open at their tops to above, allowing natural light to penetrate within. These light wells be considered the four symbolic minarets surrounding the prayer hall. In between two sets of these semi-circular cuts in the corners on the west side of the room appears a vertical extension of the shoulder-height wood

paneling that continues around the space's interior. This vertical continuation, rising to a height of nearly forty-five feet of carved and inlayed ornament that contrasts with the concrete and horizontal marble banded wall upon which it is set, is the mihrab, marking the orientation of the qibla for Muslims to face during prayer [Fig. 9].

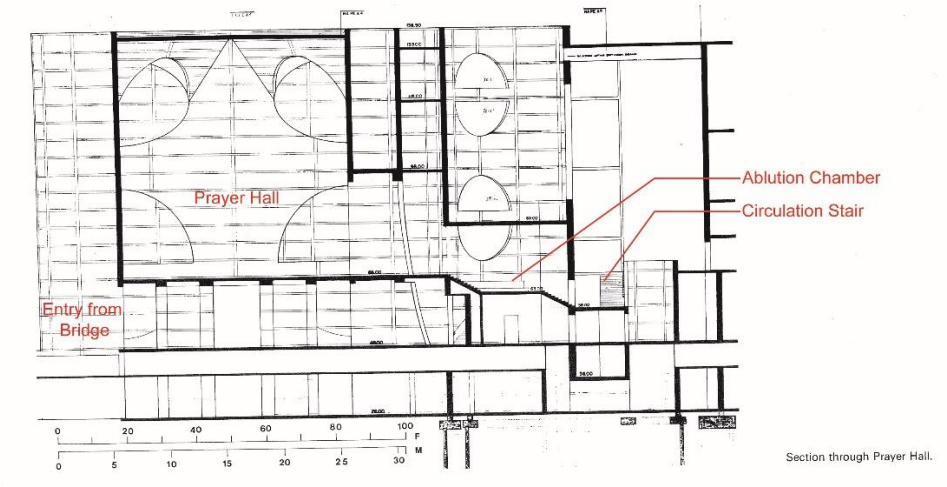


Fig. 10. Louis Kahn, section through Prayer Hall, Bangladesh Parliament Building, Dhaka, Bagnladesh, 1962.

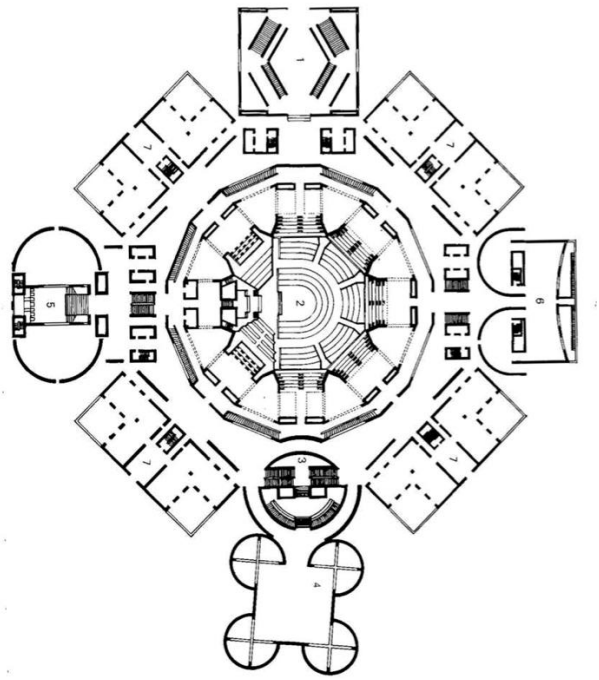


Fig. 11. Louis Kahn, floor plan, Bangladesh Parliament Building, Dhaka, Bangladesh, 1962.

Upon leaving the Prayer Hall, the path ascends the feature stairs to a semicircular walk leading into an ambulatory that encircles the central unit of the nine-unit plan; the Assembly Chamber (Fig. 12). The use of the nine-square grid can be observed in the layout of many of Louis Kahn's buildings, especially in those religious in nature: the Mikveh Israel Synagogue in Philadelphia, PA; the Unitarian Church in Rochester, NY; and the Hurva Synagogue in Jerusalem, Israel.[18] In these plans the most sacred of spaces are located in the center of the grid, and this is true too with the Assembly Hall housed in the Parliament Building.

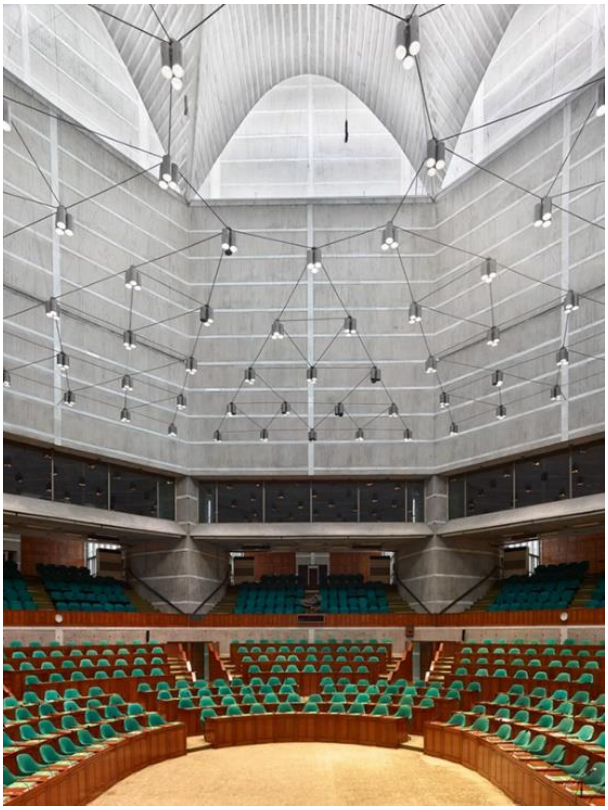


Fig. 12. Louis Kahn, assembly hall Bangladesh Parliament Building, Dhaka, 1962. Photo by Carter Cumbie

The Assembly Hall also has a symbolic connection to the architecture of a mosque. It is an octagonal space with eight rows of

seating for Parliamentary Ministers radiating and terracing in height from the center of the room. A parabolic dome of concrete covers the space. The dome touches down at each of the eight corners of the walls with the open arches providing openings for light to flood into the chamber. The dome is a common feature of a mosque. Below the magnificent dome is the Platform for the Speaker of the Assembly, which is reminiscent of the Minbar that, in the mosque, the prayer leader stands to deliver his sermon.[19]

Fig. 13. Mirza Ahmed Jan, dome of the prayer hall, Tara Masjid (star mosque), Dhaka, Bangladesh, 19th Century.

The buildings prayer hall is an obvious connection to the mosque, as it has all the architectural features common to mosques in Dhaka. This correlation is not lost on the Bengali and so the economy of the Parliaments arrangement and composition is precious in its symbolic ordering of rooms.

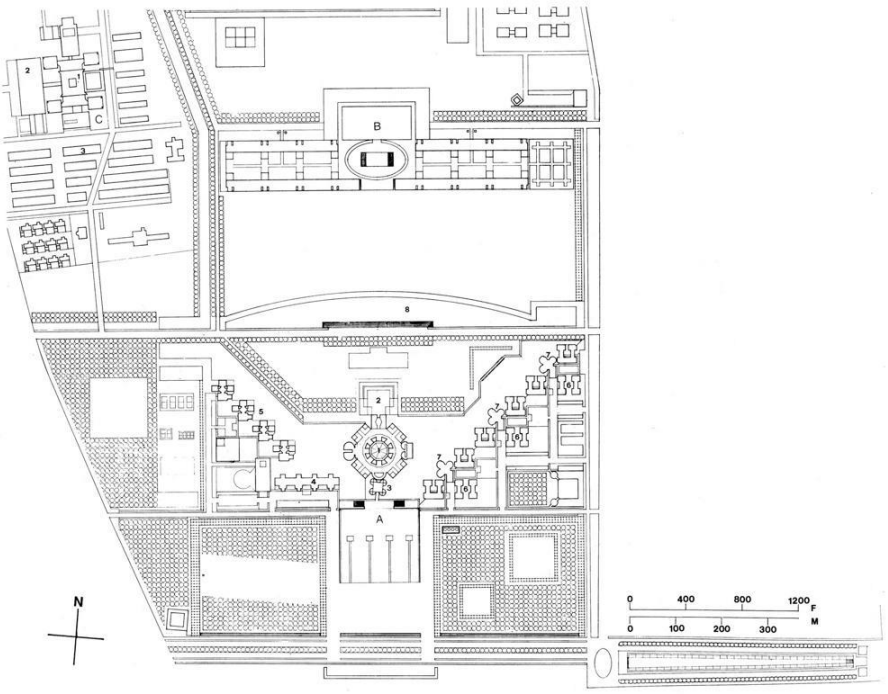


Fig. 14 Louis Kahn, site plan, National Assembly Complex, Dhaka, Bangladesh 1962. Drawing from Artstor.

Spirit of the Region

> "Reaching beyond the architecture of the immediate area, the building has assimilated important archetypes of the region among other ways through the extension of its parks and water pools. The architect has re-interpreted and transformed these ideas through a process that applied concepts of construction technology to conditions specific to the Dhaka locale. The result is a building that while universal in its source of forms, aesthetics and technologies, could be in no other place."[20] Jury of the Aga Kahn Awards for Architecture, awarded to the Jatiyo Sangsad Bhaban in 1989.

The Aga Kahn Award for Architecture is a prize for architectural achievement established by the Aga Kahn, the top-ranking imam (prayer leader) of the Nizarism, which is one of the largest branches of Muslims in the world.[21] The award for architecture is bestowed to projects that have been successful in addressing the needs and aspirations of an

Islamic Society.[22] In receiving this award in 1989, seven years after its completion, this building was solidified as a jewel of cultural and spiritual relevance in not just the country of Bangladesh itself, but in the hearts of Muslims around the world; a spiritual leader of Islam had deemed this building to be an achievement and point of pride in keeping with the spirit of the region.

Louis Kahn said that he "kept thinking of how these buildings [the complex as a whole] may be grouped and what would cause them to take their place on the land," when he was thinking about the design and layout of not only the assembly building, but the Sher-e-Bangla Nagar project as a whole.[23] By situating the Assembly Building at the heart of his design for this "City of the Tiger of Bengal" [Fig. 14], and by situating the ideals and principles of Islam and mosque architecture at the heart of the Assembly Building, the Jatiyo Sangsad Bhaban, Louis Kahn has been extraordinarily successful in situating the architecture at the heart of the spirit of the region.

Endnotes

[1] Abdus Samad, "Jatiyo Sangsad Bhaban National Parliament House." *Londoni, Londoni Worldwide Limited*, 26 Mar. 2012, www.londoni.co/index.php/who-s-who?id=325.

[2] Adnan Morshed, "MUZHARUL ISLAM'S ARCHITECTURAL MODERNISM AND BENGALI NATIONALISM." *Traditional Dwellings and Settlements Review* 26, no. 1 (2014): 29. http://www.jstor.org/stable/24347576.

[3] Abdus Samad, "Jatiyo Sangsad Bhaban National Parliament House." Londoni, Londoni Worldwide Limited, 26 Mar. 2012, www.londoni.co/index.php/who-s-who?id=325.

[4] Dr Crispin Bates, "History - British History in depth: The Hidden Story of Partition and its Legacies," BBC, March 03, 2011, , accessed December 12, 2017, http://www.bbc.co.uk/history/british/modern/partition1947_01.shtml.

[5] Ibid.

[6] Abdus Samad, "Jatiyo Sangsad Bhaban National Parliament House." Londoni, Londoni Worldwide Limited, 26 Mar. 2012, www.londoni.co/index.php/who-s-who?id=325.

[7] Ibid.

[8] David Bruce. Brownlee, De Long David Gilson, and Louis I. Kahn, Louis I. Kahn: in the realm of architecture ; (New York: Rizzoli, 2005), 499.

[9] Ernst J. Grube and George Michell, Architecture of the Islamic world: its history and social meaning, with a complete survey of key monuments and 758 ill., 112 in color (New York: Morrow, 1978), 22.

[10] Sarah Williams Goldhagen, *Louis Kahn's Situated Modernism* (Yale University Press, 2001), 163.

[11] Ernst J. Grube and George Michell, Architecture of the Islamic world: its history and social meaning, with a complete survey of key monuments and 758 ill., 112 in color (New York: Morrow, 1978), 176.

[12] Sarah Williams Goldhagen, *Louis Kahn's Situated Modernism* (Yale University Press, 2001), 181.

[13] Ernst J. Grube and George Michell, Architecture of the Islamic world: its history and social meaning, with a complete survey of key monuments and 758 ill., 112 in color (New York: Morrow, 1978), 51.

[14] Ibid., 34.

[15] Ernst J. Grube and George Michell, Architecture of the Islamic world: its history and social meaning, with a complete survey of key monuments and 758 ill., 112 in color (New York: Morrow, 1978), 30.

[16] Ibid., 18.

[17] Ibid.

[18] Heinz Ronner, Louis I. Kahn: Complete Work, 1935-74. BirkhaÌUser, 1977.

[19] Ernst J. Grube and George Michell, Architecture of the Islamic world: its history and social meaning, with a complete survey of key monuments and 758 ill., 112 in color (New York: Morrow, 1978), 19.

[20] "Aga Khan Award for Architecture | Aga Khan Development Network." AKDN. March 14, 2017. Accessed December 12, 2017. http://www.akdn.org/architecture/.

[21] Ibid.

[22] Ibid.

[23] Heinz Ronner, Louis I. Kahn: Complete Work, 1935-74. *BirkhaÌUser*, 1977, 230.

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Bibliography

"Aga Khan Award for Architecture | Aga Khan Development Network." AKDN. March 14, 2017. Accessed December 12, 2017. http://www.akdn.org/architecture/.

"Facts about the church." Evangelische Kaiser-Wilhelm-Gedächtnis-Kirchengemeinde Berlin. Accessed December 06, 2017. http://www.gedaechtniskirche-berlin.de/facts-about-church.

Banerji, Anupam. The Architecture of Corbusier and Kahn in the East: a Philosophical Inquiry. Mellen, 2001.

Bardi, Lina B, and Cathrine Veikos. Lina Bo Bardi: The Theory of Architectural Practice. , 2014. Print.

Bardi, Lina Bo, and Aldo Van. Eyck. São Paulo Art Museum: São Paulo, Brasil, 1957-1968. São Paulo: Instituto Lina Bo e P.M. Bardi, 1997.

Bardi, Lina Bo. "Museo De Arte De São Paulo." ANY: Architecture New York, no. 5 (1994): 24-25. http://www.jstor.org/stable/41845634.

Bardi, Lina Bo. Stones against Diamonds. AA Publ., 2013.

Bates, Dr Crispin. "History - British History in depth: The Hidden Story of Partition and its Legacies." BBC. March 03, 2011. Accessed December 12, 2017. http://www.bbc.co.uk/history/british/modern/partition1947_01.shtml.

Besset, Maurice. Who was Le Corbusier? Translated by Robin Kemball. Cleveland: World Pub., 1968.

Bo Bardi, Lina. 1957-1968. Sao Paulo Museum of Art. http://library.artstor.org/asset/AWSS35953_35953_29395517.

Boyken, Immo, and Hans J. Oestmann. "Ludwig Mies Van Der Rohe and Egon Eiermann: The Dictate of Order." Journal of the Society of Architectural Historians 49, no. 2 (1990): 133-53. doi:10.2307/990473.

Brownlee, David Bruce., De Long David Gilson, and Louis I. Kahn. Louis I. Kahn: in the realm of architecture ;. New York: Rizzoli, 2005.

Casabella 571: International Architecture Review

Coll, Jaime. "Structure and Play in Le Corbusier's Art Works." AA Files, no. 31 (1996): 3-14.

Corbusier, Le and Hervé, Lucien. Le Corbusier; as Artist, as Writer. Neuchatel, Switzerland: Editions du Griffon, 1970.

Corbusier, Le, and W. Boesiger. Oeuvre complète. Translated by William B. Gleckman. Vol. 5. 7 vols. Zurich, Switzerland: Editions Girsberger, 1957.

Corbusier, Le, and W. Boesiger. Oeuvre complète. Translated by William B. Gleckman. Vol. 6. 7 vols. Zurich, Switzerland: Editions Girsberger, 1957.

Fernández-Galiano, Luis. "'La Dea Stanca' = the Tired Goddess: [Lina Bo Bardi]." AV Monografías = AV Monographs, no. 180, 2015, pp. 2-3.

Giurgola, Romaldo, and Jaimini Mehta. Louis I. Kahn. Boulder, CO: Westview Press, 1976.

Godfrey, Brian J. "Revisiting Rio De Janeiro and Sao Paulo." Geographical Review 89, no. 1 (1999): 94-121. doi:10.2307/216142.

Goldhagen, Sarah Williams. Louis Kahn's Situated Modernism. Yale University Press, 2001.

Gorlin, Alexander. "The Ghost in the Machine: Surrealism in the Work of Le Corbusier." Perspecta 18 (1982): 51-65. doi:10.2307/1567035.

Grube, Ernst J., and George Michell. Architecture of the Islamic world: its history and social meaning, with a complete survey of key monuments and 758 ill., 112 in color. New York: Morrow, 1978.

Haque, Saif Ul., et al. Pundranagar to Sherebanglanagar: Architecture in Bangladesh. Chetana Sthapatya Unnoyon Society, 1997.

Herrmann, Wolfgang. Gottfried Semper: In Search of Architecture. Cambridge, MA, The MIT Press, 1989.

Hillenbrand, Robert. Islamic Architecture: Form, Function and Meaning. Columbia University Press, 2004.

http://archgened.oucreate.com/uncategorized/louis-kahn-jatiyo-sangsad-bhaban/ (IMAGE FROM SOUTH)

Jenger, Jean, and Le Corbusier. Le Corbusier: Architect, Painter, Poet. New York: Abrams, 1996.

Jorge, Mauricio. "Adriano Pedrosa Appointed Artistic Director." E-flux.com. October 31, 2014. Accessed October 23, 2017. http://www.e-flux.com/announcements/30423/adriano-pedrosa-appointed-artistic-director/.

Kahn, Louis I. The Development by Louis I. Kahn of the Design for the Second Capital of Pakistan at Dacca. School of Design, North Carolina State of the University of North Carolina at Raleigh, 1964.

Kahn, Louis I., and Michael Merrill. Louis Kahn: Drawing to Find Out; the Dominican Motherhouse and the Patient Search for Architecture. Baden, Müller, 2010.

Kahn, Louis I., et al. National Capital of Bangladesh, Dhaka, Bangladesh, 1962-83. A.D.A. EDITA Tokyo, 1994.

Kahn, Louis Isidore. 1962-1982. National Assembly Building of Bangladesh. http://library.artstor.org/asset/AWSS35953_35953_29410085.

Kahn, Louis Isidore. 1962-1982. National Assembly Building of Bangladesh. http://library.artstor.org/asset/AWSS35953_35953_29410093.

Kahn, Louis Isidore. 1962-1982. National Assembly Building of Bangladesh. http://library.artstor.org/asset/AWSS35953_35953_29410087.

Kahn, Louis Isidore., and Louis I. Kahn. Louis Kahn: Dhaka. D. Simonett, 2004.

Khodorkovsky, Maria. "Etymology of "Economy"." ALTA Language Services. April 30, 2013. Accessed December 12, 2017. https://www.altalang.com/beyond-words/2008/10/15/etymology-of-economy/.

Kries, Mateo, et al. Louis Kahn the Power of Architecture: Weil am Rhein, Vitra Design Museum, 2012.

Laugier, Marc-Antoine. An Essay on Architecture. Translated by Wolfgang Herrmann and Anni Herrmann. Los Angeles: Hennessey & Ingalls, 1977.

Lima, Zeuler R. M. de A. Lina Bo Bardi. New Haven: Yale University Press, 2014.

Lima, Zueler R., and Vera M. Pallamin. "Claiming Public Space: São Paulo's Trianon Terrace." Progressive Planning: Citizen, Democray, & Public Space, July 28, 2008, 34-39.

Mathey, François, Annick Davy, and Martine Mathias. Le Corbusier: oeuvre tissé. Paris: Philippe Sers, 1987.

Michell, George. Architecture of the Islamic World: Its History and Social Meaning. Thames Et Hudson, 1995.

Minster, Christopher. "What Do You Know About Sao Paulo?" ThoughtCo. May 16, 2016. Accessed October 23, 2017. https://www.thoughtco.com/the-history-of-sao-paulo-2136590.

Monchaux, Thomas De. "A Beacon in Berlin." The New Yorker. January 5, 2017. Accessed November 28, 2017. https://www.newyorker.com/culture/culture-desk/a-beacon-in-berlin.

Morshed, Adnan. "MUZHARUL ISLAM'S ARCHITECTURAL MODERNISM AND BENGALI NATIONALISM." Traditional Dwellings and Settlements Review 26, no. 1 (2014): 29. http://www.jstor.org/stable/24347576.

Paulmann, Johannes. "Representation without Emulation: German Cultural Diplomacy in Search of Integration and Self-Assurance during the Adenauer Era." German Politics & Society 25, no. 2 (83) (2007): 168-200. http://www.jstor.org/stable/23742817.

Pauly, Danièle. Le Corbusier: La Chapelle de Ronchamp. Paris: Fondation Le Corbusier, 1997.

Pearson, Christopher. "Le Corbusier and the Acoustical Trope: An Investigation of Its Origins." Journal of the Society of Architectural Historians 56, no. 2 (1997): 168-83. doi:10.2307/991282

Petersen, Michael . "Egon Eiermann - New Chairs for New Churches. The SE 119 and SE 121." Smow Design . December 19, 2011. Accessed December 07, 2017. https://www.smow.com/blog/2011/12/egon-eiermann-new-chairs-for-new-churches-the-se-119-and-se-121/.

Rizvi, Kishwar. “The Symbolic Potential of the Transnational Mosque.” Faith & Form, University of North Carolina Press, 2015,

faithandform.com/feature/the-symbolic-potential-of-the-transnational-mosque/.

Ronner, Heinz, et al. Louis I. Kahn: Complete Work, 1935-74. BirkhaÌUser, 1977.

RuÌschendorf, Grischa. Louis Kahn. House of the Nation. Oro Editions, 2014. (img01-05)

Rykwert, Joseph. On Adam's House in Paradise: the Idea of the Primitive Hut in Architectural History. MIT Press, 1984.

Samad, Abdus. “Jatiyo Sangsad Bhaban National Parliament House.” Londoni, Londoni Worldwide Limited, 26 Mar. 2012, www.londoni.co/index.php/who-s-who?id=325.

Samuel, Flora. "The Representation of Mary in the Architecture of Le Corbusiers Chapel at Ronchamp." Church History 68, no. 02 (1999): 398. doi:10.2307/3170863.

Semper, Gottfried. Style: Style in the Technical and Tectonic Arts ; or, Practical Aesthetics. Translated by Harry Mallgrave. Los Angeles, CA: Getty Research Inst., 2007.

Semper, Gottfried. The four elements of architecture: and Other Writings. Translated by Harry Mallgrave. Cambridge: Cambridge Univ. Press, 1989.

Stamp, Gavin. "Sacred Architecture in a Secular Century." Twentieth Century Architecture, no. 3 (1998): 8-16. http://www.jstor.org/stable/41859539.

Stoller, Ezra, Eugenia Bell. The Chapel at Ronchamp. New York: Princeton Architectural Press, 1999.

The Editors of Encyclopædia Britannica. "Gottfried Semper." Encyclopædia Britannica. October 13, 2009. Accessed December 1, 2017. https://www.britannica.com/biography/Gottfried-Semper.

Veikos, Cathrine. "To Enter the Work: Ambient Art." Journal of Architectural Education (1984-) 59, no. 4 (2006): 71-80. http://www.jstor.org/stable/40480633.

Vincent, Alana M. "Worship in the Ruins." In Making Memory: Jewish and Christian Explorations in Monument, Narrative, and Liturgy, 119-40. Cambridge: James Clarke & Co, 2013. http://www.jstor.org/stable/j.ctt1cgfbg4.14.

Wagner, Monika. "Berlin Urban Spaces as Social Surfaces: Machine Aesthetics and Surface Texture." Representations 102, no. 1 (2008): 53-75. doi:10.1525/rep.2008.102.1.53.

Yoshizaka, Takamasa. Le Corbusier: Chapelle Notre Dame du Haut Ronchamp, France: 1950-54. Edited by Yukio Futagawa. Tokyo: A.D.A. Edita, 1971.