

Light in the Tourette Monastery

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Abstract: *The paper describes the work of Le Corbusier in La Tourette Monastery with the intention to capture the relationship between architecture and light, as described by the author. Light, playing with forms and materials, enlivens space by modifying the way the built environment is lived, during the day and throughout the year. Ongoing research on new space configuration becomes possible using an intangible element, which represents the main element of architecture. The research was developed with the aim to capture the relationship between architecture and light in La Tourette Monastery. It argues how light, in the late work of Le Corbusier, becomes material par excellence.*

Keywords: space, light, shape, material

1. Introduction

The Tourette Monastery is located near the city of Lyon, in Eveux-sur-Arbresle, an isolated place in the middle of nature. The initiative to build the monastery began in 1952 by the Dominican friars who were looking for a monastery for the period of preparation of new believers. Its construction was appointed to Le Corbusier by the request of Father Couturier, friend of the architect and great admirer of his works.

According to P. Belaud (Petit, 1961) the reason why the Dominicans chose an architect who did not claim to belong to the Catholic Church and who was known for his innovative spirit must be found in the foundations of the Order itself. All elements of Dominican formation represented a break with previous forms of religious life. It was necessary to show that prayer and religious life are not necessarily linked to traditional forms and that an agreement between them and more modern architecture is possible provided that the latter can surpass itself.

The Tourette convent is the result of continuous and mature research by Le Corbusier, aged seventy, which started with his journey around the world. In 1907 Jeanneret left his hometown La-Chaux-de-Fonds and went to Italy in search of new inspirations and suggestions for his work. During his visit to Tuscany, in September of the same year, he was fascinated by the Carthusian Monastery of Ema (Gresleri, 1998). This interest is linked, as can also be seen from the Master's testimony, mainly to "domestic" or "civil" architecture. During this visit he drew a plan and a section of a cell of the Carthusian Monastery writing the note: "Cell of a friar at the Carthusian Monastery of Ema. I could perfectly apply it to workers' houses, being the body of the house entirely independent".

Surprising tranquility: the great wall could hide the view of the street (Gresleri, 1998). In a letter dated September 14, 1907, sent to his parents, Le Corbusier writes: "[...] I went to the Carthusian Monastery yesterday, I hope I haven't already told you, and there I found the solution for the one-of-a-kind workers' house. Only it will be difficult to find the landscape again. How lucky are these monks!" (Gresleri, 1998).

An important role for the success of the overall result was played by the relationship between the building and the site. The relationship between the Carthusian Monastery of Ema and the landscape that surrounds it influenced Le Corbusier's choice of placing the convent on sloping ground to "dominate" the surrounding nature. During the meetings with the Dominican Fathers, he explains: "I came here. I had taken, as always, my sketchbook. I drew the road, I drew the horizons, I set the orientation of the sun, I "smelt" the topography. I decided on the precise place, as this place was not fixed at all. By choosing the place I was committing the criminal or valid act. The first gesture to make is the choice, the nature of the place, and therefore the composition that will be created in these conditions.

Here, in this ground so mobile, which ran away, descended, dripped, I said to myself: I will not put the tray on the ground, since it runs away from all sides"(Petit, 1961). Le Corbusier conceives the project from the upper plane, the one that will be composed of the horizon and measures everything starting from this horizontal linesloped down to the ground. In this way the building appears in a regular shape at the top determining its own organism while touching the ground. It assembles architecture and nature perfectly related in the empty space of a suspension.

The apparently very rigid form of the convent was strongly desired by Father Couturier who, in the continuous letters' correspondence, provided the Master (Le Corbusier) with all kinds of indications. He suggested to the architect to visit the Thoronet Convent as a very essence of what a monastery of no matter what era should be. It is very interesting to note how Le Corbusier was able to transfer compositional rules of ancient tradition into the expressiveness of the modern.

The whole building forms a quadrilateral which encloses an internal courtyard. The convent is perceived as a single massive block from distance but when approaching it, one discovers that there are two separated bodies: the parallelepiped of the church and a C-shaped building supported by pillars, with a residential use. The functions of the buildings were related to the orientation in open space. The church was deliberately placed to the north because it did not need direct sunlight.

2. Use of Light in architecture

Light is a form of energy that can be used as a material in art and design. It can be manipulated to create different effects, such as shadows, reflections, and refractions. The three fundamental aspects of physical optics, such as rectilinear, reflection and refraction of propagation of light are considered by designers while proposing shapes and forms (Kepes, 1967). Light can also be used to create illusions of depth, movement, and texture. There are many ways to use light as a material, including projection, reflection, and transmission. It can also determine shape and size perception. Architectural lighting ultimately showcases and accentuates certain design elements to foster, establish or emphasize a building's aesthetic, history, and purpose. Materials have a reflective index. Identical forms made of different materials can be perceived differently by users.

Kepes claims that when the artist or designer makes forms, he shapes light and the forms themselves become shape of light (Kepes, 1967). Kelly (Kelly, 1952) claims that architectural design and decoration is created to serve mankind by bettering the sensual perception of life. While exploiting the history of light in architecture from the seventeenth century, Oeschlin (Oeschlin, 1988) points out that light was an active and purposeful protagonist. Le Corbusier's chapel at Ronchamps is an impressive example of clarity and strength of form achieved by limiting the space enclosing surface to a level of light reflectance, is widely discussed by Kepes (Kepes, 1967).

On the other hand, there are some authors that consider light as immaterial. Rajchman (Rajchman, 1994) sustain that architects often understand lightness as immateriality. While citing Milan Kundera, he (Rajchman, 1994) links the bearing concept to the architectural sense and claims that lightness is unbearable because it cannot be borne, cannot be supported because it moves in a free and disparate manner. To play with light demands a trained eye to recognize real and relative values, the experience and knowledge of the cultural and psychological effects on people (Kelly, 1952).

3. Methodology

The article is the result of research on the work of the architect Le Corbusier and one of his most famous projects worldwide. The research was developed with the aim to capture the relationship between architecture and light in the Tourette Monastery. For this study, it was used the literature from the author/architect himself and by various other authors such as: Rosa Tamborrino, Giovanni Denti, Francesco Tentori, Aldo Rossi, etc. The paper argues how light, in the late work of Le Corbusier, the Tourette Monastery, becomes material par excellence.

4. Light, shape and their emotional intensity in the Tourette Monastery

In a conference held in Rome in 1936 Le Corbusier, during his speech, comments on the concept of play or jeu, explaining that this notion indicates an individual intervention. The idea of the game implies that there is a creator, who has set the rules and has defined in its subject,

formal and visible purpose (Gauthier, 1987). This game of forms is not only an aesthetic spectacle, because it is not only meant to be looked at, but also to be lived. The space below the artificial ground of the Tourette ranges from a minimum of seventy centimeters to a maximum of nine meters in height, but the natural slope of the terrain, as well as the shadow created by the courtyard -without-courtyard, make it a space devoid of functionality: a virtual space that exists more to be seen than to be experienced, a space that is populated by primary figures - the cubic oratory with a pyramidal roof, the intersecting corridors, the cylinder of the spiral staircase and the parallelepiped of the sacristy. These simple forms, being primary forms, are considered by Le Corbusier to be the most beautiful, because they can be read clearly and are poetic reaction objects, full of poetic expressiveness (Tamborrino, 2003).

In the convent everything is designed on a human scale and the proportions are based on the modular the architect proposed decades before. In fact, in every project sketch, the figure of a man determines the space to be created. Every detail has its own because it is subordinated to the presence of man.

The distribution of the levels of the convent responds to a functional logic and solar lighting. The functional distribution within the same floor or any enclosed space is determined by the light. Le Corbusier attributes to light, as can be seen from his writings, an ordering function of spaces since he "composes with light". "Now, the problem of lighting is to know what lighting is: they are walls that receive the light. They are illuminated walls. The emotion comes from what the body receives on itself as an impression or pressure from the wall: and finally, from what the lighting produces both as intensity and as sweetness, according to the place" (Tamborrino, 2003).

The monks' cells occupy the two upper floors and are separated from the common areas to ensure tranquility and isolation. The dimensions are proportionate to the module: 2.26 meters high, 1.83 meters wide and 5.92 meters deep. The cell is made up of the service, rest, and study area. A loggia opens next to the desk, as wide as the cell and 1.47 meters long (Denti, 1988). The dimension of the depth is determined by the function of the loggia as a brise-soleil. In this way, the sun does not shine directly, and in winter, when the sun is lower, its light can enter and heat the cell.

All cells are connected by a long, narrow corridor which overlooks the internal courtyard. This route is marked by three rectangular windows placed side by side, arranged at eye level, repeated along the entire corridor. The light, in this case, indicates the possible internal displacements. Le Corbusier adopts a very particular type of window to close off the corridors. He allows the sunlight to break in but blocks the view with the use of a sloping concrete wall towards the outside.

On the floor of the main entrance there are the common areas of the concierge and parlors, the library, the classrooms, the chapter house, the student friars' room, and the oratory. At the entrance are the porter's lodge and four parlors, with a shape like an irregular semicircle, arranged

on two sides of a narrow corridor. Inside, the small, enclosed space and seating invite silence and privacy. In this context, a window would be too much or, at the very least, it would ruin that sense of intimacy and isolation.

For this reason, Le Corbusier proposed small square openings, distributed on the wall to sufficiently illuminate the interior space. The library is in the south and east wings. This position responds to two essential needs for life in the convent: it is located at a level immediately below that of the cells, and therefore easily accessible, and guarantees constant lighting without direct sunlight. The wall facing the courtyard is a glass wall, made up of transparent and non-transparent squares, like in a children's game. This type of wall can generate an effect of light and shadow which colors the space of the library and is proposed for all the walls of the internal part placed on this floor.

On the same floor, on the opposite side of the courtyard, there is another window. In this case, another type of pans de verreondulatores (undulating pane of glass) was used (Brooks Allen, 1993). The composition of this wall derives from the musical rhythms proposed in the architecture. Four elements with proportions according to the golden rule and their twenty-four variants organized along the facade have been chosen. The criterion used is based on density fluctuations, from which corrugated glass gets its name. The relationship between musical metric and architectural composition has ancient roots, but here they have different meanings based on the relationship with sunlight. This effect can be better perceived in the canteen, which is located on the floor below the classrooms, overlooking the valley, in the western part of the monastery. The interior of the canteen is very simple: an open space with the presence of only four columns, parallel to the glass walls. It is the use of light that connects the place with man, who uses it with the rhythmic change of the sun's reflection during the day.

On the floor of the refectory is the inner courtyard, the space that connects the three wings of the monastery with the church. According to tradition, this courtyard should have a square shape to ensure communication between the different environments. Le Corbusier decided to create a cross shape as a symbol of the religious spirit. It not only changes the shape, but also its relationship with the outside. In fact, the yard is closed for better use even during the winter season. The windows fill the corridor with light and pans de verreondulatores create different spaces along its entire length.

The vertical connection of the different levels of the monastery is made through stairs. The type of staircase that the architect uses is spiral. From the outside it is perceived as a cylindrical tower. The openings in the wall of small size, distributed on the surface of the cylinder almost randomly, are positioned according to a logic of providing solar lighting. Inside the courtyard, in addition to the spiral staircase, there is also a prayer room. It has the shape of a cube resting on a cross-shaped base and a pyramid-shaped cover.

The lighting of the space is closely related to the function.

Both lighting and lack of lighting play a key role in Le Corbusier's architecture. The prayer room, in the Dominican tradition, consists of a hall with an altar in front of the entrance. This small and simple space is enriched using light that enters from two thin vertical slits located next to the altar. In this way, the only point where the light is concentrated is precisely the altar, while the rest is illuminated by reflection. The crack at the top of the pyramid aims to create a diffused lighting effect, because the light does not enter directly, but is reflected on the walls.

Although the church is connected to the other building through courtyard corridors, it is a separate building. On the one hand, it looks like it was designed at a second moment as no similar features are observed to the rest. The church had to be as high as possible; for this reason, it touches the ground directly.

The building itself consists of three different parts in terms of form and function: the main nave, the sacristy, and the body where the small altars are located. The altar space is illuminated with canons lumière (light cannons) (Brooks Allen, 1993) three cones with different angles to the plane of the cover. The light enters vertically on the altars, with different effects. The first cone faces east to catch the morning rays, the second looks up to catch the midday sun and the third to the west to catch the sunset rays.

To preserve the symmetry of the church, on the terrace of the sacristy, several concrete prisms in the shape of an irregular pentagon have been placed to allow the sun to enter. These prisms are called "light machine guns" (Brooks Allen, 1993). The interior of the church is illuminated by reflection from canons a lumière and mitrailleuses (machine guns). A small crack in the ceiling of the main nave allows the lighting in the upper part of the church thus creating a very interesting effect between the light and darkness.

Le Corbusier thinks that the perception of a person within space is determined by the presence of walls and the visual effects they cause. In the Tourette monastery, the walls are made of concrete, as is the floor: light, white or colored, direct, or diffused, when it reflects on them, transforms them from amorphous materials to living materials.

5. Conclusions

Architects often understand lightness as immateriality (Rajchman, 1994). For Le Corbusier, light connects the terms of the language expressed in his architecture: "There is no doubt I use the light abundantly. Light is, in my opinion, the basic food of architecture. I compose with light". Light sources are used sparingly, but their placement plays a major role in determining the interior volume. Le Corbusier composes spatial scenography where light plays with shapes and materials, revitalizing space, changing the way we live in this space, both during the day and throughout the year.

Le Corbusier was convinced that the light/shadow ratio, which makes form visible, precedes color. This notion, borrowed from traditional art, does not exclude the use of other colors but intensifies or hides the characteristics; depending on the type of space we want to create. It is an

element able to attribute quality to the space and spiritual dimension to the building.

Rajchman while citing Milan Kundera links the bearing concept to the architectural sense and claims that lightness is unbearable because it cannot be borne, cannot be supported because it moves in a free and disparate manner (Rajchman, 1994). The light in La Tourette is not only the light of commodity, 'as a matter of circumstance and convenience' (Borys, 2004). Light is prefigured as a material par excellence. This philosophy of lightning was driven by emotional behaviors.

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