Idea of Environment and Architectural Form in India by Le Corbusier
– On the Creation of Villa Shodhan at Ahmedabad –

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Abstract
This paper aims to clarify the relationship between the global idea on the environment (“Sun, Space, Green”) by Le Corbusier and its realization at the local site, analyzing the change process of architectural form of Villa Shodhan (1951-1956) at Ahmedabad in India. According to the analysis of Le Corbusier Archives and Carnets (Sketchbooks), Le Corbusier studies the problem of the weather condition, especially the glaring sunlight at Ahmedabad, with his own architectural languages from the start of the project. However, in the process of this project, the independent parasol roof is integrated into the main structure of this house. That is to say, the roof as equipment to get shade from the sun, becomes the border space between the sky and the building, like the roof garden of Villa Savoye in 1929, which is open to the sky and joins the inside to the outside of the architectural work at the same time. In short, the main theme of this project realized in Ahmedabad by Le Corbusier is the “space” (“espace” in French), as architectural environment, which can’t be measured by the conventional architectural language of “roof” or “wall”.

Keywords: Le Corbusier; Villa Shodhan; Ahmedabad-India; sun; roof

1. Introduction
This paper aims to clarify the relationship between the global idea on the environment and its realization at the local site, analyzing the change process of architectural form of Le Corbusier’s Villa Shodhan (1951-1956) at Ahmedabad in India.

French architect Le Corbusier (1887-1965) formulates “Sun, Space, Green” as necessary conditions of the modern urban environment in the hygienic point of view through the book of Chartre d’Athêne (1943). This formula is the original idea on the environment by Le Corbusier which closely concerns the study on “Unité d’habitation” as an arrival of Le Corbusier’s theory, and it seems that “Sun, Space, Green” is the reflection of the total vision on the new architectural and urban environment.

As Le Corbusier considers Unité d’habitation as prototype which is able to be constructed anywhere, “Sun, Space, Green” should be realized at any places on the earth. On the other hand, Sun, space and green of the site of Villa Shodhan analyzed in this paper is remarkably different from the European environment on which the most of his former architectural works are situated. It is certain that Le Corbusier makes the city plans or the architectural works at Algiers of the North Africa or at Rio de Janeiro of the South America before the realization in India (the urbanism of Chandigarh and some buildings at Ahmedabad), therefore it can not to be said that the Le Corbusier’s environmental idea is based not only on the local environment in Europe. However, in the practice at Ahmedabad, Le Corbusier often visits at the each site to realize the projects and spends the time more than the other projects in foreign countries. It seems that we can analyze more concretely the process of the realization of his idea on the environment.

On one hand, Benton (1987) points out the similarity between Villa Shodhan and Villa Baizeau in 1928, and discusses the translation of the particular site condition into the universal architectural language by Le Corbusier. On the other hand, Curtis (1986) interprets the quotations from the traditional Indian architectural languages and its integration to Le Corbusier’s former architectural languages. But, in any studies, the influence of the local environment in the change process of the architectural form is not clarified.

Compared with these studies, this paper treats 282 architectural drawings (109 plans are dated) concerning the realization of Villa Shodhan published in Le Corbusier Archive XXVI and Le Corbusier’s notes in Le Corbusier Carnets (Sketchbooks), vols.2-4, and arranges the creative process by 4 terms which correspond to the periods of the execution of a series of plans in the meeting with the clients. By this restoration of the process (Table 1), this paper analyzes the relation between the change process of the architectural form and of Le Corbusier’s idea of the site environment where Villa Shodhan will be realized.

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2. Creative process of Villa Shodhan

2.1. First term (from the last days of October 1951 to the last days of May 1952)

At first, the client of the project of Villa Shodhan is Mr. Surottamu Hutheesing, who requests at Le Corbusier to construct a new house in the occasion of Le Corbusier’s first trip in India for the work of the urbanism of Chandigarh. Subsequently, Mr. Shodhan takes over directly this project with little modification.

The fundamental idea of this project is represented in Le Corbusier’s Sketchbook. At the first trip in India from 18 February to 19 March 1951, Le Corbusier visits not only at Chandigarh, also at Ahmedabad, where he draws the landscape around the site proposed for the construction of the new house. The old town of Ahmedabad which prospered from the textile manufacture since 15th century is drawn from the other side of the river, and he goes to see the old town and draws Sheth Hathisingh Temple for the Jainas (Fig.1). To which Le Corbusier pays attention there is the form closed to the outside and opened to the inner court. In fact, Le Corbusier notes in his Sketchbook that the theme of the architectural creation at Ahmedabad is the “claustra” as the opened wall for the ventilation and the prevention of crime: “the most important thing is to be open without gate and window”.

On the other hand, Le Corbusier notes in fragments on his Sketchbook the theme of the “parasol” as the independent roof of the main structure like the roof of Villa Baizeau in 1928. According to Le Corbusier, the “parasol” is an equipment to cast a shadow, it can be said that the problem of the glaring sunlight is the theme from the start of this project.

In fact, in the concrete work for this project, Le Corbusier studies the reversed plan of Sheth Hathisingh Temple; the open space to the outside which has the cubic volume with the slope at the center, surrounded by the “Brise-soleil (Sunbreaker)” with the claustra as parapet. At the same time, he studies the vaults with four columns which are independent of the main structure of the house. The composition of the site plan is decided according to the direction of the local wind at Ahmedabad (from south-west to north-east).

Concerning the composition of the inner space, it can be pointed out that the double-height entrance hall is the reflection of the traditional wooden houses at Ahmedabad. And also, it can be said that the vault roof used consistently through the first term is the influence of “Chartis” (parasol supported with four slender columns of the traditional Indian temples). However, the vaults are one of the fundamental prototypes by Le Corbusier, and this prototype which comes from the project of Maisons Monol in 1919 evolves to the independent vault roof in his project of the reorganization of the village without the real site studied from 1934 to 1938.

In the project of the house in North Africa in 1942, Le Corbusier comments on the vault roof: “In building in a modern way, we have discovered a harmony between the countryside, the climate and tradition!” Le Corbusier’s theme in this case is the view from the inner space and the problem of the climate. The vaults are its solution, and he discovers that its prototype is suitable for the local landscape. It can be said that at Ahmedabad Le Corbusier tries to apply this experience in North Africa.
After that, for the second trip to India from 27 October to 28 November 1951, he prepares the series of plans dated 24 October 1952. And six months after this trip, in the occasion of the third trip to India from 23 March to 19 April 1951, he continues to study, especially the vegetations and the view of the terrace under the vault roof (Fig.2).  

In short, the first term is the period when Le Corbusier studies the sun shade and the ventilation came from the characteristic sunlight in India by his ordinary architectural languages. This study is presented as the “loggia” with claustra and the “terrace” under the vault.

2.2. Second term (from the first days to the middle days of June 1952)  
This term after the third trip to India from 23 March to 19 April 1952 is comparatively short, but in this period, Le Corbusier studies various roof forms concerning the problem of the sunlight which has been already studied in the first term.  
At first, from 4 to 12 June 1952, the grand plane roof with the triangular elevation instead of the vault roof is studied. This roof is supported by the cross-shaped wall, but as the support structure of the vault roof, its structure is still independent of the main structure of the house. And also, the same opening system with the claustra as parapet of the loggia is studied to make more open space under the roof.

On the other hand, the position of the inner slope inserted the house shifts: the slope which was adjacent to the north-east wall comes to jut out to the exterior. The protrusion of the slope cannot be confirmed in the former house projected by Le Corbusier, such a spatial composition of a slope is studied at Ahmedabad for the first time.

After that, from 12 to 18 June 1952, the pair of two roofs with the triangular elevation comes to transform into simpler flat roof. By such a modification, the independence of the roof becomes to be week and unifies to the main structure. The spatial composition of this house comes to be similar to the unit of Immeubles-villas in 1922 which has the inner balcony; “jardin suspendu”.

As compared with the studies of the independent roof in the first and second terms, the roof is considered as the extension of the main structure of the house in the third term. This modification means the abandon of the independent roof, and the change from the structure by wall to the skeleton of “Domino” system. Thus, the open space under the roof comes to be integrated into the main architectural volume. In fact, the openings increase more than before, and another solution of the open space is studied.

On the façades of the house, the claustra as parapet is set up, but its balcony is the pure loggia rather than Brise-Soleil (Fig.4).
On the other hand, the fundamental elements of the plan are not modified, but the vegetations of the upper level are studied, which was the theme in the first term, not in the second term. The theme of “Green” is developed once more in the open space under the roof.

In short, the third term is the characteristic period about the unification of the main structure and the roof system without modification of the special composition of the house. The change of the roof form is a proof on the study of the solution of the sunlight, but this unification brings the study of the vegetation. The “Green” which is one of the most important ideas on the environment by Le Corbusier is considered once more in this term.

2.4. Fourth term (from the middle days of March 1953 to the first days of August 1955)

Le Corbusier visits in India with a series of plans studied in the third term. The forth term is from the fifth trip to India (from 19 May to 20 June 1953) to the middle days of August 1955. Especially, in the period nearly this fifth trip, the project is revised much more.

In this term, the most important modification is the system of the main structure; the columns which bordered on the building go back a little to the inner space. This disposition of the columns makes the flat roof more independent, and consequently more similar to the roof of Villa Baizeau. However, it can not be said that this roof system is the direct quotation of Villa Baizeau, which is the application of the “Dom-ino” system with the column-slab for the functional solution of the condition of the hot climate. In the creative process of this project, the studies on the roof of the house with the wall system at first, is to make a more open space under the roof; in the forth term, this grand flat roof has four gaping holes. In a sense, it is nothing else but the negation of the function as parasol.

In the occasion of the visit at Ahmedabad of the fifth trip to India, Le Corbusier notes on the roof in his Sketchbook as follow. “attention to the parasol bored largely // 1 for the breeze // 2 for the plants // for the beds” (Fig.5). Le Corbusier considers the space under the roof as not only the shade of the sunlight but also the relax place gazing at the sky, which corresponds to the traditional life style in India. The theme of “be open” noted in his Sketchbook of the first visit at Ahmedabad is reflected not only on the loggia with the claustra, but also on the space under the roof, called “terrasse solairum (terrace for the sunbathe)” in the forth term.

And more, in this term, the slope disposed in the north-east of the house turns round and moves to the south-east. Corresponding to this modification, the north-east façade becomes more closed by the wall, and the spatial contrast between the slope, the south-west corner (living room) and the north-east corner (entrance hall), is emphasized.

And after such modifications relatively in the short time, the project of this house is handed over to Mr. Shodhan. In spite of the difference of the site condition, Le Corbusier adapts the final architectural form at the new site, according to the direction of the wind.

As compared with such important modifications, the vegetation in the house is not studied very well, except for the flower pods on the terrace. It seems that Le Corbusier cannot find out the importance of the vegetation in the house which stands around the green environment of the site. It can be said that the trees at Ahmedabad, which changes dramatically through a year, brings Le Corbusier to the abandon of the vegetation of the inner space.
In short, the fourth term is the period when the roof becomes independent once more, and the space under the roof becomes suitable for the traditional condition in India by the characteristic way of Le Corbusier. This condition is not only the climatic environment but also the human environment.  

3. Conclusion

For the first time of the creative process of this project, the theme which Le Corbusier has noted in his Sketchbook was above all the sun, and the realization of “be open”, making the shade on the other hand.

At first, Le Corbusier has studied the independent vault roof and the claustra around the building as the open space. And he has disposed this architectural volume corresponding to the local direction of the wind at Ahmedabad. Such studies are the adaptation of his own architectural languages rather than the quotation of the traditional motifs of the Indian architecture.

However, in the process of this project, the form of the roof has changed much more than the other architectural elements. Especially, in the second and third terms, various forms of the roof were studied without modification of the planning of the house. In this change process, the roof independent of the main structure of the house has become to integrate into the architectural volume, at the same time the space under the roof has become to be more open by making the holes. Such a modification of the roof is also based by the original architectural languages which Le Corbusier has already created. So, it was not the particular answer to the local condition, if anything, Le Corbusier has realized the idea of “Sun, Space, Green”, adapting his various prototypes. That is to say, Le Corbusier has measured the unique environment at Ahmedabad with his own prototypes.

It is certain that the final architectural form is similar to Villa Baizeau, but the notion of ‘roof’ is not so clear in this project. Although the first idea includes the independent parasol like the roof of Villa Baizeau, Le Corbusier comments in his Œuvre complète Villa Shodhan as the application of Villa Savoye to India: “This plan recalls the ingenuity of the Villa Savoy of 1929-30 at Poissy, placed here in a tropical and Indian setting, as well as in Le Corbusier’s post-1950 style.”47. That is to say, the roof as equipment to get shade from the sun, becomes the border space between the sky and the building, like the roof garden of Villa Savoye, which is open to the sky and joins the inside to the outside of the architectural work at the same time.

In short, the main theme of this project realized at Ahmedabad by Le Corbusier is the “space” or the “extension” (“espace” in French)48, as architectural environment, which can’t be measured by the conventional architectural language of “roof” or “wall”. Such a “space” is not the abstract notion, the phenomenon if anything. Through the creative process, the “Sun” of the place at Ahmedabad, as the fundamental of the variety of the natural or human environment, gradually leads Le Corbusier to the more basic consideration on the architectural environment. In this sense, each element of “Sun, Space, Green” is not equivalent, the “Sun” has the most important matter for Le Corbusier’s creation.

References


Notes

1 Le Corbusier, Willy Boesiger éd. (1957) Le Corbusier Œuvre complète, vol.6, Les Editions d’Architecture Artemis Zurich, 134-143
2 Le Corbusier (1943) La charte d’Athènes, Plon, Paris
10 The correct period and the reason of the change of the client are not clear, but it seems that this period is after the fourth trip in India by Le Corbusier. At least, the site plan for Mr. Shodhan dated 21 June 1953 exists cf., Le Corbusier, FLC7089, 1953.6.21.
12 Claustra: it means the opening of the heavy wall. In the architectural works by Le Corbusier, its opening is tried at first in the wall of the entrance hall of Unité d’habitation à Marseille in 1945, and in the case of Chapel at Ronchamp in 1950, the expression is more plastic (cf., Jaques Shrigllo et al. (1992) Le Corbusier l’Unité d’Habitation de Marseille, Les Éditions Parenthèses, (Marseille). On the other hand, the parapet wall with many holes of the loggia is also called claustra (cf., Le Corbusier (1981), Le Corbusier Carnets, vol.2, op.cit., D16(116)).
13 “important tout peut être ouvert sans portes ni fenêtres” (Le Corbusier, Le Corbusier Carnets, vol.2, op.cit., E18(358))
14 In addition, the color stone, the painted concrete and the textiles are mentioned too. Thus, Le Corbusier considers the color of the architectural space form the start, but in his architectural creation, the study on the color is normally the final stage. The relation between the color and the place of India must be analyzed in another paper.
16 cf., FLC6554; FLC6659

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Brise-soleil (sun breaker): it means the equipment for the protection of the direct sunlight, which is studied at first in the projects in the tropical region in North Africa in 1930’s, and adapted to the façades of the skyscraper in Algeria or Brazil. And this form evolves to the balcony called the "loggia" which is provided in the façade of Unité d’habitation. The adaptation of this equipment is tried on the façade of Villa du Docteur Curutchet in South America in 1949 or the wall of Carpenter Visual Arts Center in 1961. As the systematic explanation by Le Corbusier himself, cf., Le Corbusier, Willy Boesiger éd. (1946) Le Corbusier Œuvre complète, vol.4, Les Editions d'Architecture Artemis Zurich, 103-115. However, Le Corbusier does not use the word “Brise-soleil” in the creation of Villa Shodhan. Rather, he uses the word “loggia” or “claustra”. Brise-soleil is found out in the traditional landscape at Ahmedabad in the occasion of his fifth trip in India (Le Corbusier 1981), Le Corbusier Carnets, vol.2, op.cit., G28(966). Thus, Le Corbusier discovers the similarity between the traditional technique of the control of environment and his own prototype. It is not simple adaptation of the prototype.


Le Corbusier, Willy Boesiger éd. (1957) Le Corbusier Œuvre complète, op.cit., vol.6, 134

The word “espace” by Le Corbusier is not the same meaning as “space” translated in English. In the schema of “soleil, espace, verdure (Sun, Space, Green)”, “espace” is the inbetween of the earth and the sky. In fact, in Le Corbusier’s sketch, the word “espace” is noted on the exterior of the building. And more, Le Corbusier’s notion on “espace” is also said “espace indicible (inexpressible space)” after 1945. According to Le Corbusier, such a “espace” explodes and spread. cf., Le Corbusier (1955) Modulor 2, Éditions de L’Architecture d’Aujourd’hui, Paris, 23-25. So, it seems that “espace” of Le Corbusier is a architectural phenomenon itself.