



Le Corbusier
à PARIS
et
LUXNÉ
1962
et
JEAN PETT

Reproduction Jean Pett
LUXNÉ 1962

LC's Poetic *Endurance* Time and Space — Light and Matter

ANA TOSTÕES

Chair of **docomomo** International

The theme of this 53rd **docomomo** Journal is LC — 50 Years After. As a tribute to Le Corbusier (LC) on the occasion of the 50th anniversary of his death, this issue of **docomomo** Journal is focused on rehabilitation and conservation processes undertaken on Le Corbusier buildings and sites worldwide monitored by the *Fondation Le Corbusier* (FLC).

LC prolific personality as theorist, painter, sculptor, architect, urban planner, researcher, disseminator, thinker, and provocative activist, helped to make him a universal author. His dual and inseparable theoretical and practical activities represented a source for LC's balanced inspirational and systematic method. Envisaging "*la planète comme chantier*", LC drove his obsessive constructive impulse around the whole world, to nations such as Japan, Russia, Argentina and India. Thinking deeply about the human condition in the contemporary age, he looked for solutions to solve social, technical and spatial problems, believing that architecture could have the power to improve the world. To the question "architecture or revolution?" he answered "revolution can be avoided"² through modern architecture.

50 years later, Le Corbusier still creates controversy, passion, discussion and intellectual stimulus, confirming the *endurance* of his long life energy, spirit and legacy. Through time and space, proportion and matter, his architecture is in fact a "wise, correct and magnificent play of volumes gathered under light"³ crystallizing a vision of the world as an "*espace indicible*"⁴.

Nowadays, several of LC's buildings are under threat. This issue of **docomomo** Journal presents a large variety of interventions and approaches, showing the cross-section of issues that Le Corbusier's work raises in the restoration of Modern Architecture.

From houses to facilities, from Europe to Asia or America, from public authorities to private owners, these buildings have stood the test of time, proving their resilience and character.

I wish to thank Bénédicte Gandini, Michel Richard, and the FLC, for accepting the challenge to be the guest editors of this issue and to share with us the "transnational" importance of Le Corbusier, through the analyzes conducted by a exceptional range of experts.

docomomo International wishes to stress the importance of the FLC in disseminating LC's ideas and preserving his work. Besides being responsible for keeping alive LC's knowledge and spirit, and gathering precious archives

consulted on a daily basis by researchers worldwide, the FLC is carrying out a most important task: the proposed inclusion of "The architectural work of Le Corbusier [as] an outstanding contribution to the Modern Movement" in the UNESCO World Heritage List (WHL). Envisaged as cultural property, it is a transnational application that brings together the nations of Argentina, Belgium, France, India, Japan and Switzerland at the World Heritage Convention. The aim is to fight for recognition of the buildings and sites constructed by Le Corbusier worldwide as exceptional and as milestones of the Modern Movement that influenced the practice of architecture everywhere.

After many well-founded efforts over 10 years, for recognition of the vital nature of LC's legacy, the WHL candidacy is still waiting for final positive results. As stated at the 12th **docomomo** Council Meeting (Helsinki, 2012), "**docomomo** International confirms the outstanding universal value of architectural works by Le Corbusier and supports a serial nomination in the World's Heritage List". Therefore, we believe that the conclusion of the recognition process is urgent, as we all know that it will also guarantee the protection of invaluable architectural ensembles, as in the case of the perfectly balanced Capitol Complex in Chandigarh which is under threat (see p. 84).

Quoting Tim Benton, LC with exigent and permanent criticism "was somebody capable of renewing himself at every moment, [believing] in the universal value of architecture"⁵. Today, we could reformulate this universal value as the urgency to strive towards a sustainable future. That's why **docomomo** chose "Adaptive Reuse: The Modern Movement towards the Future" as the main topic for the 14th *International docomomo Conference* that will take place in Lisbon from the 6th to the 9th September 2016, in order to pursue the Modern Movement's social and collective project engaged with the challenge of creating a better place to live in an ever faster changing world.

Notes

- 1 Jean-Louis Cohen, *Le Corbusier: La planète comme chantier*, Paris, Editions Textuel, 2005.
- 2 Le Corbusier, *Vers une Architecture*, Paris, Editions Crès, 1923.
- 3 *Idem*.
- 4 Le Corbusier, "*L'espace indicible*", *L'Architecture d'Aujourd'hui*, Paris, Nov.-Dec., 1946.
- 5 "UNESCO World Heritage List: Le Corbusier Proposal Deferred", **docomomo** Journal, 44, Barcelona, 2011, p. 89-90.



Le Corbusier and Pierre Jeanneret, *Maison La Roche*, Paris, France, 1925. © FLC/SPA, 1976.

The Role of the *Fondation Le Corbusier* in the Conservation of the Le Corbusier's Architectural Work

BY BÉNÉDICTE GANDINI AND MICHEL RICHARD

I here declare, for every eventuality, that I leave everything that I possess to an administrative entity, the "Fondation Le Corbusier", or any other meaningful form, which shall become a spiritual entity, that is, a continuation of the endeavor pursued throughout a lifetime.

Le Corbusier, 13 January 1960, Archives FLC

Le Corbusier died on 27 August 1965 at Roquebrune-Cap-Martin, near his *Cabanon*.

Without direct heirs and driven by the fear that his carefully conserved archives and works be scattered after his death, Le Corbusier spent the last fifteen years of his life conceiving and implementing, down to its smallest details, the project of a Foundation that would bear his name.

Today the activity of the *Fondation Le Corbusier* comprises two main undertakings: circulating his work and spreading his ideas; preserving the architect's work and collections. Indeed as the legatee and direct offshoot of its creator Le Corbusier, the Foundation holds the moral rights to this work and therefore has a duty to constantly watch over his architectural work (and indeed the artist's entire legacy).

For the Foundation each of his buildings constitute a piece of art in and of itself. Each issue concerned in the restoration of Le Corbusier's buildings is effectively governed by this specificity.

docomomo *Journal* 53, issued on the occasion of the commemoration of Le Corbusier's death is dedicated to the activity of the *Fondation Le Corbusier* in monitoring the restoration of as many of his architectural works as possible. In this introduction we will briefly explain how the Foundation is permanently involved in the conservation of his architectural work, highlighting its specificity.

The articles will describe a selection of interventions in different countries.

By way of introduction, the example of the *Maisons La Roche and Jeanneret* is presented as what should be considered as an exemplary intervention implemented by the Foundation itself.

All these examples provide a comprehensive contribution to the study of 20th century heritage conservation methods

and illustrate how a methodical restoration can preserve the authenticity of an outstanding building.

Complexity of the Architectural Work

Relatively modest in quantitative terms, Le Corbusier's architectural work is spatially extensive, distributed across eleven countries on four continents. If the majority of works are in Europe, in particular France and Switzerland, some buildings — and by no means the least important — are located in the states of the Punjab and Gujarat in India, and others in Tunisia, Japan, Iraq, Argentina, Russia and the USA.

These buildings are very different in nature and in size: they include villas and houses, cultural buildings, multi-family housing, office buildings, gymnasiums, stadiums, etc. The status of the owners also varies widely — ranging from public authorities (including nation-states such as Tunisia, India or Japan) to associations, private owners, condominiums, etc.

Their conservation status also varies greatly and the legislation or heritage protection policy may differ greatly from one country to another.

Today we can observe an important transformation in regards to proprietors and/or uses (new uses or new norms — hygiene, security, environmental criteria, etc.). And the awareness of the high quality of these works, is very often accompanied today by a desire to bring to light their original spirit.

Otherwise, some buildings will be required to take into account new constraints, such as tourist visitation, that risk altering the quality of authenticity or originality that contributed to their fame.

The role of the *Fondation Le Corbusier*

All restoration and development projects, involving Le Corbusier's executed architectural projects, are submitted to an international committee of experts. Its role is both to contribute to the need to respect Le Corbusier's original work and to make recommendations, on the basis of which the Foundation's Governing Board can either authorize applications addressed to it or express its reservations.

This expertise involves experts being sent regularly to advise owners, allocatees or occupants of buildings executed by Le Corbusier before and during the restoration process.

The monitoring of restoration projects is carried out by the Foundation architect, who also has the role of consultant to the owners. In this capacity, the architect contributes to research undertaken in the Foundation's archives, she organises the network of owners and contractors and coordinates the Foundation's initiatives with the territorial authorities and state territorial authorities. The Foundation architect ensures that archives of architectural restoration work are put together as the work progresses, by collecting the research undertaken for each restoration project: historical research, technical matters, planning application file, colour samplings, etc. and where possible, retrieving authentic components removed during restoration work. All these elements will ultimately enable more detailed knowledge of each of the buildings created by Le Corbusier and consequently facilitate maintenance in the long term. They also contribute to improving overall knowledge of the work's gestation and meaning.

Gilles Ragot's article about the extensive restoration of the *Cité de Refuge* in Paris is one example of the means by which the Foundation controls a restoration, but it also illustrates how it can provide assistance to the owner and the architect in charge during the research and construction phases. This restoration conducted by the chief architect of historical monuments, François Chatillon, is conducted altogether under the control of the owner and the developer, the *Fondation Le Corbusier*, the Ministry of Culture (DRAC, STAP) and the City (Old Paris Commission).

Le Corbusier's mural painting in the Villa E-1027 in Roquebrune-Cap-Martin, near the *Cabanon*, illustrates another example of a different type of support with the excellent intervention performed by Marie-Odile Hubert to conserve the original work of Le Corbusier, as well as his own restorations of his work in the villa.

At present the other paintings on the site, located in the *Cabanon* and in the *Etoile de Mer*, are being restored by Marie-Odile Hubert. The *Fondation Le Corbusier* and the Ministry of Culture supervise this conservation work.

Conservation and Archives

For the *Fondation Le Corbusier*, each building is a prototype, a unique experience, a clue to Le Corbusier's creative process. Furthermore, it constitutes an important step in the chronology of various restoration campaigns.

Any renovation, restoration project, or accident, even, grants us the opportunity to enrich our material knowledge of a work, to understand its evolution, its building process, the hazards of its construction... For this reason, it is critical that the Foundation be involved in the studies and the work accomplished during restoration. Research undertaken, updated materials, and discovered documents enhance the history and comprehension of the edifice. The analysis of these living archives in light of the documents conserved by the Foundation, offers the opportunity to benefit from a fruitful interface. Such archives nourish scientific research and stimulate interest in the restoration of the building in question.

The conservation of current and future archives has become a question of the utmost importance for architects

and proprietors: it prevents them from wasting precious time, it allows them to confirm their hypotheses, and even permits them to avoid significant errors.

The *Couvent de la Tourette* in Eveux in France, the *Petite Villa* on the Lake Genevain Switzerland and the *Villa Savoye* respectively presented by Roberta Grignolo, Elise Koering and Susanna Caccia and Carlo Olmo, highlight the importance of historical studies. They also emphasize the numerous campaigns of restoration successively carried out by Le Corbusier himself on the buildings. All of them present fundamental issues regarding the preservation of the original work.

Networks

The Foundation has developed an arrangement providing it at all times with the most reliable information possible on the current state of buildings and the likelihood of possible changes. This arrangement involves a network of the buildings' owners, with which the Foundation is in regular contact. It also has an unsolicited network of correspondents in all the countries concerned, informing it without fail of suspicious movements or serious threats.

In most countries, the Foundation is in constant contact with State agencies and is systematically concerned in the review and monitoring of projects for which they are responsible. This does not necessarily mean that there is always a consensus of opinions on projects under review, but it is an instance of productive discussion.

Moreover, the work that has been in progress for over 10 years for the nomination of "The Architectural work of Le Corbusier" on the World Heritage List has accentuated the relations between the *Fondation Le Corbusier* and leaders of the architectural profession in different countries. The cooperation is illustrated finally by the last dossier submitted in January 2015 to the World Heritage Center. The proposed Series nomination consists of 17 works or sites in 7 countries (Argentina, Germany, Belgium, France, India, Japan and Switzerland).

Some articles in this issue of the *docomomo Journal* 53 reflect the continual correlation between the *Fondation Le Corbusier* and the owners or managers of Le Corbusier's architectural works of Le Corbusier in the world. This is illustrated with the essay on the *Villa Curutchet* in La Plata, Argentina, by Julio Santana and Jorge Néstor Bozzano, the text on the *Musée d'Art Occidental*, in Tokyo, by Yoshiyuki Yamana and Kyo Fukuda or by the Shika Jain's "Heritage in danger" contribution about the Capitol Complex in Chandigarh.

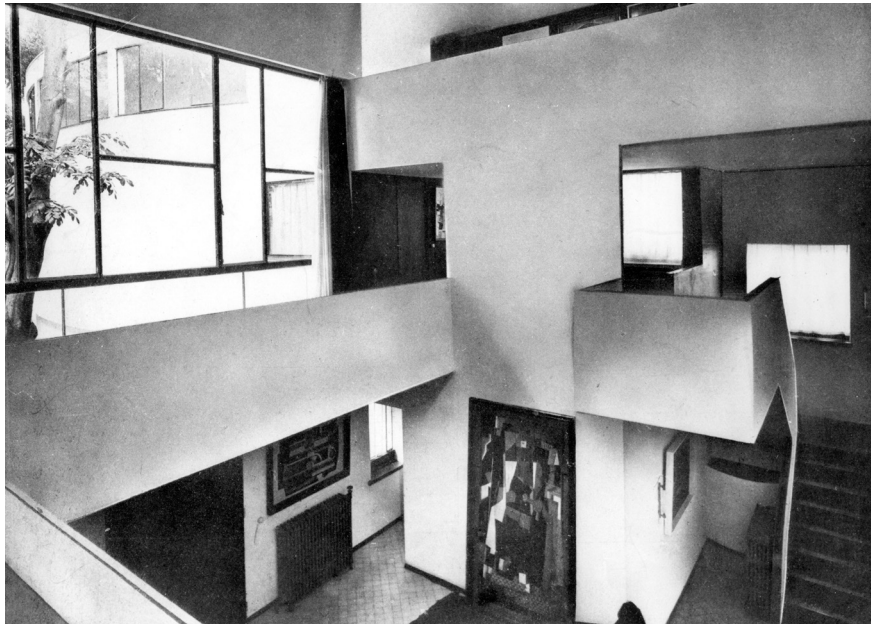
The *Fondation Le Corbusier* is directly involved in these matters, as the owner of three iconic Le Corbusier buildings belonging to the series nominated for inscription on the World Heritage List. The Foundation is particularly responsible as regards the maintenance and permanence of the architectural works bequeathed to it:

the *Maisons La Roche* and *Jeanneret*, headquarters of the Foundation in Paris (1925); Le Corbusier's apartment located on the top two floors of the Molitor building (1932), in Paris, and the *Petite Villa* on shore of Lake Geneva, in Switzerland, which had been the house for his parents (1924).

01 Le Corbusier and Pierre Jeanneret, *Maison La Roche*, Paris, France, 1925. © FLC/SPA, 1926.



02 Le Corbusier and Pierre Jeanneret, *Maisons La Roche and Jeanneret*, Paris, France, 1925. After the restoration of the facades. © Ph. Cemal Emden, 2015.



03 Le Corbusier and Pierre Jeanneret, *Maison La Roche*, Paris, France, 1925. © FLC/SPA, 1924.



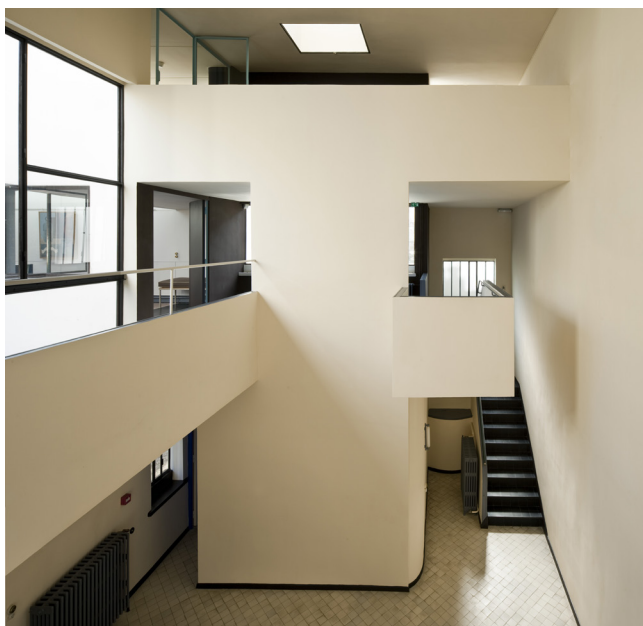
04 Le Corbusier and Pierre Jeanneret, *Maisons La Roche and Jeanneret*, Paris, France, 1925. Before restoration. © Olivier Martin Gambier, 2010.



05 Le Corbusier and Pierre Jeanneret, *Maisons La Roche and Jeanneret*, Paris, France, 1925. Before restoration. © Olivier Martin Gambier, 2010.



06 Le Corbusier and Pierre Jeanneret, *Maisons La Roche and Jeanneret*, Paris, France, 1925. After the restoration of the facades. © Ph. Cemal Emden, 2015.



07 Le Corbusier - Pierre Jeanneret, *Maisons La Roche and Jeanneret*, Paris, France, 1925. After the restoration. © Olivier Martin Gambier, 2010.

After the restoration of the interior of the *Maison La Roche* in 2008/2009, the restoration of its facades will be completed, with the restitution of the original garden, at the end of 2015. Simultaneously, the Foundation is directing a restoration work at the *Petite Villa* in Corseaux. Two articles, one by Franz Graf and Giulia Marino, the other by Elise Koering, reflect the method developed for this building.

Finally, the Foundation is also involved in the study of the conservation of the apartment-studio of Le Corbusier.

The restoration work for the façades of the *Maisons La Roche and Jeanneret* highlights the important methodology implemented based on archives, in-situ surveys, testimonials and continuous confrontation between these various sources of information and documentation.

An Exemplary Restoration: the *Maisons La Roche and Jeanneret*

Maison La Roche now has tens of thousands of visitors each year. For many scholars, students and enthusiasts, it stands as the first major landmark in the work of this modernist architect-artist and one of the keys to its interpretation. It gave Le Corbusier the opportunity to implement the constructive principles and vocabulary that were to characterize most of his subsequent projects and creations. These consisted in the subtle application of the *Five Points for a New Architecture* as well as in systematizing the use of polychromy, the invention of the ramp, continuity between inside and outside, etc. It also provided an apposite illustration of the concept of the *promenade architecturale*.

Currently open to visitors from all over the world since 1925, the *Maison La Roche* has indeed significantly contributed to its creator's reception. In undertaking the restoration, the Foundation wished to offer, to the visitors, a piece of art as close as possible to the "jewel case" that had been entrusted to it, thereby maintaining its donor's generous gesture. This was why it proved necessary to go back on

some of the changes that had been made by the Foundation in 1970 when the Foundation occupied in the *Maisons La Roche and Jeanneret*. The purpose was to go back to the situation of 1936, the date of the last changes made by Le Corbusier and Pierre Jeanneret. Over and above strictly "archaeological" considerations, and given that the house had lost its residential function with its owner's death, the aim was to restore the spirit of the place around three key principles: to present a place for living with its different functions, to maintain its original commission as a collector's gallery displaying paintings by reorganizing the exhibition space and finally to preserve its educational role by promoting understanding of the work undertaken to restore it.

The restoration work started in 2008 with the renovation of the interiors of *Maison La Roche*, was completed in spring 2015 with the reconstitution of the original façades and gardens of *Maisons La Roche and Jeanneret*. It was the outcome of a process involving intense research and experimentation and it contributed to renewing techniques implemented over the previous decades for the preservation of Le Corbusier's built work. These involved systematizing and combining historical and archival research, core drilling and other types of material analyses, technical studies, addressing data acquired with historical accounts, and setting up scientific committees to monitor work in progress. In this context, the different invited experts had to propose their recommendations before the restoration work started.

It was on this basis that the Foundation undertook this most important project, and entrusted management of the work to Pierre-Antoine Gatier, ACMH. Also involved in this undertaking were the committee of experts for the architectural work — a group of specialists on Le Corbusier's built work set up by the Foundation — and the Foundation's Board of Directors. At the end of the preliminary study, the French National Historic Monuments Commission approved the decision to undertake restoration on the basis of a joint agreement between the project manager and the Foundation.

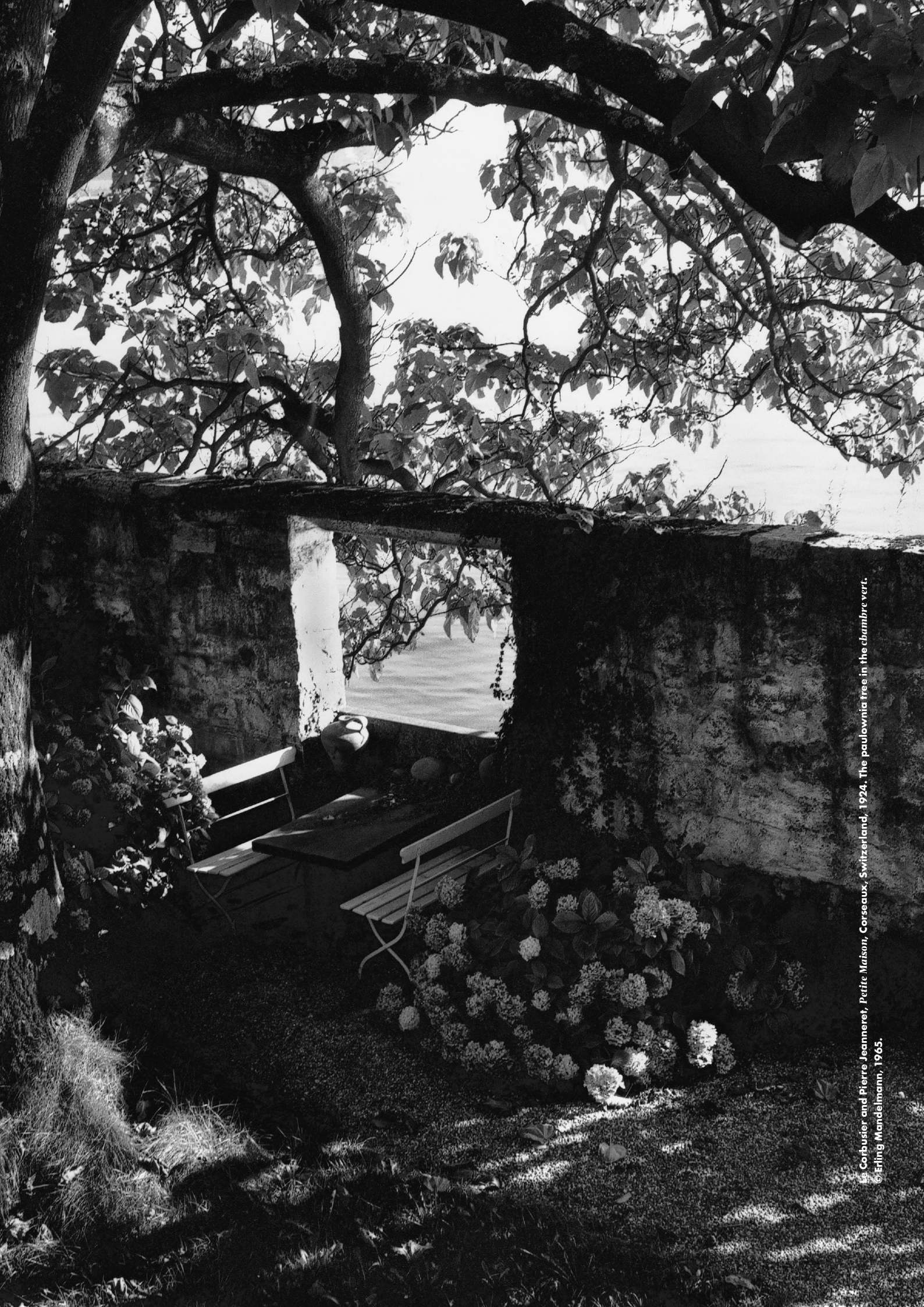
As regards the exterior, the same principles presided over the choice of color and materials when restoring the façades as closely as possible to the original.

Restoration of *Maison La Roche* had helped to underline the pertinence and plastic qualities of the architectural polychromy and to emphasize the role of color in the design and perception of the different spaces. It thus seemed logical to echo the interior space in the outward surfaces, their diverse hues shifting with the hours of daylight. *Maisons La Roche and Jeanneret* recovered their original 1925 Auteuil ton pierre" ("stone toned") façades.

Rediscovering the polychromy of the interiors and the "stone colored" façades (Le Corbusier's quotation) was a surprise to specialists and novices alike, reared on images of the famous "white villas" of the Modern Movement. The role of the Foundation and the experts attached to it, may well, on occasion, to unsettle our vision of the work, and thus help to reinvent it. But "it's another story..."

"Left totally white, the house would just be a pot of cream".

Le Corbusier, *Almanach d'Architecture Moderne*, p. 146, 1926.



Le Corbusier and Pierre Jeanneret, *Petite Maison, Corseaux, Switzerland*, 1924. The paulownia tree in the *chambre vert*.
© Erling Mandelmann, 1965.

Restoration of the *Petite Maison*, Corseaux, 1924, Le Corbusier and Pierre Jeanneret. Construction Practice as Research

BY FRANZ GRAF AND GIULIA MARINO

The *Petite Maison*, or the villa *Le Lac* was built by Le Corbusier and Pierre Jeanneret at Corseaux, near Vevey, in 1924 for the parents of the former. Various modifications were made from then until 1973. The exteriors, façades, gardens and enclosures of this emblematic work were repaired and restored based on detailed research of the fabric and a well judged program of conservation which concluded in June 2015. This essay reports on some of the specifics of the project, the construction itself, the problems of ageing that the architects had to address, and the most recent conservation works (2013–15).

In restoration and conservation projects we draw on various modes of historical enquiry. Exaggerating the point in order to bring it more clearly into focus, we might argue that there are two kinds of history to consider each with its own particular aims: “historian history”, and “architect history”.

The first belongs to the field of architectural history, exploring social, aesthetic and technical aspects of the object, using critical analysis, studying the timelines of a project, bringing together the use of, and response to, the object with a close examination of those construction techniques and methods that situate it within the material culture of its time. This research provides a reasoned basis — non-subjective — for assessing the heritage value of the architecture, this in turn being an essential prelude to protection but also a means of defining the intervention strategy — chosen from a multiplicity of possible approaches (conservation, restoration, renovation, reconstruction, transformation, etc.).

Using “architect history”, or the material history of construction¹, one can delve further into the accumulated knowledge, integrating the life history of the object with practical actions best suited to conserving it. Detailed analysis of the architecture of building elements and components, in their structure, from fabric-as-built through all the variations to come, shows us the material we have and the possible futures we can expect of it. The scale of this scrutiny is not what counts: what matters is the attitude. Analysis of materials, their uses and construction systems is extended through their biological cycles, their transformations, amputations and overlays, as well as their behaviors and potentials for change, as support for new fabric or device for example. Material history contains the very objects of its development, that substance discerned through a mutual probing that occurs in the space between the building

and the act of restoration, enabling one to move from a knowledge that “takes note of” to a knowledge that truly “informs” the project.

In restoration, material history is integral to designing a project. But the process of working on the building is more than just execution. It is an extension of the research: a head-to-head with the document in all its uniqueness; a confirmation of the rightness of a hypothesis or decision. It is the careful observation of the degree to which the structure accepts the repairs, treatments or additions but also the inevitably difficult yet endlessly stimulating “discoveries” we make when we embrace the object as a totality, the trials and investigations by definition reduced. Standing in front of the wall, certainties fall away as we, the architects and specialists, put earlier research to the test, expand it, reconfiguring the project. The *Petite Maison* at Corseaux has been undergoing restoration since March 2013², with stages of work alternating with periods of use as a museum. To achieve the best outcome the Fondation Le Corbusier — the project client — with the help of the Federal and Cantonal heritage agencies, brought together experts in the conservation of modern architecture and specialists on issues such as polychromy, art restoration, chemistry, façade engineering in metal and mineral products, as well as landscape design.

The works are really “guided maintenance” (the *nec plus ultra* of preservation) with the first stage focusing on exteriors, façades, garden and enclosures. The house was built in the second part of 1924, the architect searching the Riviera³ until he found the right spot. It was to be a low-cost building for the architect’s parents: he had already created the *Maison Blanche* at Chaux-de-Fonds for them and now sought to move them with the few pieces of furniture they possessed to somewhere warmer. This is how Jean Badovici, chief editor of *L’Architecture Vivante* put it in 1925:

Here the architects had to build a pleasant, comfortable house of 62 m² on a strictly confined plot; it had to blend with the splendid panorama and the mountains in such a way as to take in the widest possible horizon from the windows. (...) It consists of 6 bays 2.75 by 4 meters forming a harmonious whole. The façade has a single window 10.75 m long facing the splendid lake view; from inside the rooms there is a 14 m long perspective. The ingenious layout and clever subdivision of volumes make the interior of this little dwelling seem immense. It is a practical house for two people with no staff but a steady flow of visitors. Construction is admirable in its simplicity; no useless complexity; few doors and windows; a single material, lightness and comfort with minimum expense and maximum solidity⁴.

Against this rather magnified description one might contrast the elaborate and troublesome — if ultimately successful — business of LC's negotiations with the neighbors⁵. Some architectural solutions, like the open-work wall at the western end, can only be explained as the result of negotiations with the Cornus next door. Design and installation of the wall to the "green room" with its stone wall raised high and pierced by a "square hole"⁶ would be the product of hesitations over the different positions of the habitable parallelepiped and the annexation of the void as "external chamber", with the fortune this idea would enjoy later in the architect's output⁷. The house was constructed in 1924 by builder Albert Colombo. Le Corbusier was not enamored of him: "The man who has built this for me has been an idiot from the start. He has proved it with this very badly made house"⁸. Thereafter would be a long list of complaints and running repairs or remedial measures of one kind or another. The architect asked his cousin, Pierre Jeanneret, to handle this elsewhere but at the *Petite Maison* Le Corbusier himself would be the main one concerned. This is well recorded, notably in correspondence between Le Corbusier and his mother, who was living there and regularly reminded him of the fact. In 1931, the road on the north side of the construction became a cantonal road, and a concrete wall to reduce noise was proposed by the local commune, and built. The architect would respond with the gates and dog-window, following up with a reception-annex — the *fruitière* designed in the early project from 1924 — in timber joinery and roughcast hollow blocks, with gently pitched roof in pressed steel on a metal I-beam. The weatherproofing of the flat roof, in *Toitex*, soon posed problems and had to be repaired several times, notably in 1950 when it was covered with earth and turfed. But the main defect came from a design error, superbly illustrated by the architect in the chapter "Houses can also catch whooping cough" from the book *Une Petite Maison*⁹. Variations in the lake waters produced a crack that literally split the construction in two. To counter the yearly cracking and the infiltration of rainwater on the west and north sides Le Corbusier installed siding of the type favored in the Jura regions, of painted strips of galvanized steel in 1931. In 1950, with "heavy heart" he would also add *Fural* aluminum sheeting to the entire lake facade¹⁰, placed horizontally, i.e. contrary to good building practice but more logical in terms of site and object.

The architect paid attention to the design of the garden and kitchen garden, proposing roses, lawn, vegetables, floral beds, and attractive catalpa and weeping willow as early as 1925. Every bit as integral as the carpets and floor finishes¹¹, these were central to the conservation-restoration project.

The acacia? It took the sun away from the neighbors' lettuces. It was removed. The weeping willow? It wept too much, taking the sun out of the bedroom, dragging its leaves in the lake; all very poetic, yes... Down came the weeping willow! The paulownia stayed, with its hideous great leaves, its enormous trunk covered in blotchy lichens like a meadow covered in dandelions. Its branches are venturing out in all directions, defying the laws of statics (embedding of projecting beams). Every year the old boy's branch is cut back: that is, the one that has become the least tolerable¹².

The tree was too old and had to be replaced, but all the cuttings taken from the parent died except those growing into the stone wall that plunges down into the lake, from which the new paulownia sprang. The garden and vegetable plot were rebuilt, to the obvious advantage of the place. The polychromy of the ensemble has also been subject to unusually close analysis. We all know that modern architecture was very rarely in fact "white architecture"¹³, and *La Petite Maison* is a case in point. In fact the architect was in the midst of his first forays into exterior polychromy — villas *La Roche* and *Jeanneret* and the *Cité Frugès* de Pessac, exact contemporaries of the Little House, have greens, ochers, etc... Here it seems the white had "the faintest tinge of green", even though there are clues pointing to a pale pink version as well¹⁴. The green tint and the original nature of the paint — milk-of-lime and oil on render — may be well documented, but that is not a reason to go back to the original of 1924 given that the architect remodeled the *Petite Maison* several times, especially in 1951 when he added roof insulation and the metal façade on the lake front. Apart from a few colored elements here and there¹⁵, the overall scheme specified is "white", but analysis does not confirm that this was the color when built. On elements of fabric that are closest to their authentic condition the green has been reproduced, with a view to maintaining a consistent "reference date" (i.e. 1965). Later interventions have been less respectful of integrity, and the actors involved felt that keeping them as "historical traces" was an easy option. The *Fural* aluminum siding will not even be cleaned, while the galvanized steel sheet will be repainted with an aluminum paint as it was originally because some areas are already showing signs of corrosion. The conservation/restoration of the *Petite Maison* has been carried out by taking to the limit the idea of preservation of original fabric. On two occasions we have been asked to advise on retaining elements that would ordinarily be changed but that serve here as guarantees of material authenticity. One was the 180 mm steel I-beam supporting the *fruitière*. This was partially rusted and scheduled for replacement, which is normal practice. But from close examination only possible after dismantling, and by turning the beam around the other way, it was possible to have it conserved. The other was a galvanized steel



01 Le Corbusier and Pierre Jeanneret, *Petite Maison*, Corseaux, Switzerland, 1924. View from the lake. © FLC/SPA, Paris, 1924.



02 Le Corbusier and Pierre Jeanneret, *Petite Maison*, Corseaux, Switzerland, 1924. Restored. View from the lake. © Patrick Moser, 2014.



03 Le Corbusier and Pierre Jeanneret, *Petite Maison*, Corseaux, Switzerland, 1924. The south wall during the restoration. © Patrick Moser, 2014.



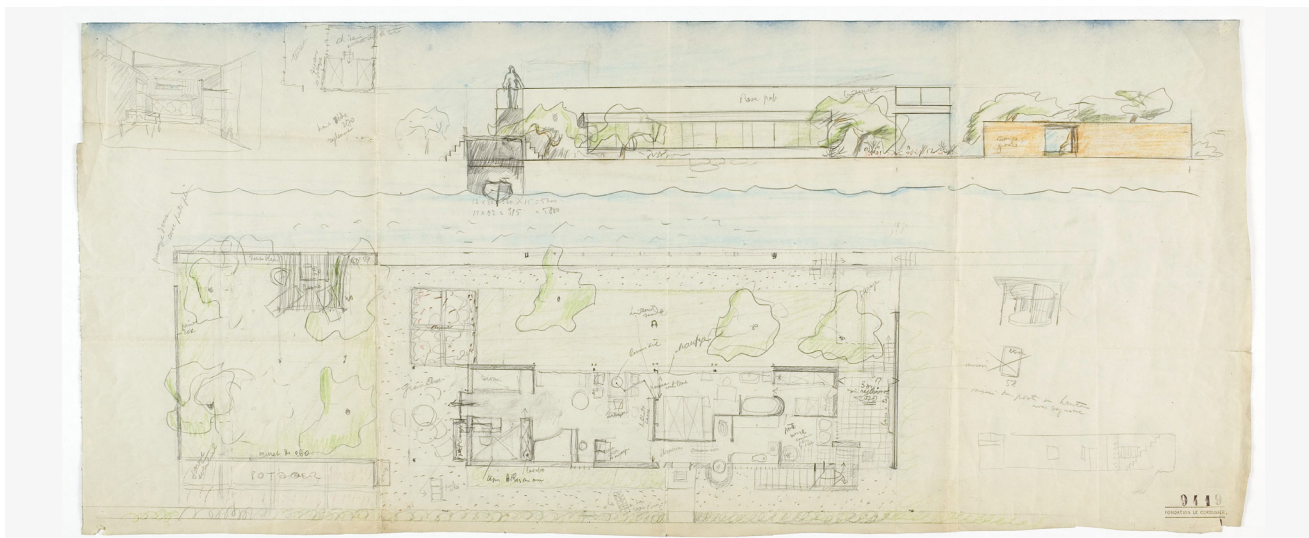
04 Le Corbusier and Pierre Jeanneret, *Petite Maison*, Corseaux, Switzerland, 1924. The wall that closes off the property on the north, a steel I-beam supporting the *fruitière*, 1924. © Le Corbusier, *Une Petite Maison*, Artemis, 1954.



05 Le Corbusier and Pierre Jeanneret, *Petite Maison*, Corseaux, Switzerland, 1924. The original steel I-beam after restoration. © Giulia Marino, 2014.



06 Le Corbusier and Pierre Jeanneret, *Petite Maison*, Corseaux, Switzerland, 1924. The north façade during the restoration. © Patrick Moser, 2014.



07 Le Corbusier and Pierre Jeanneret, *Petite Maison*, Corseaux, Switzerland, 1924. Plan and south facade. © Fondation Le Corbusier, Paris.

window support otherwise destined for the skip, which was reinstated with no constructional problems and is perfectly serviceable. Works to the exterior of the *Petite Maison* will be finished in June 2015, the anniversary of Le Corbusier's death. A campaign to conserve the interiors will follow, and the inevitable question of use will have to be tackled: what should this iconic place be? What it has always been, a little house to visit, "the purest possible manifestation of that cell which is man's shelter, the snail shell on human scale"¹⁶, or an empty shell for hosting temporary exhibitions?

For all the high profile modern buildings like *La Petite Maison* that are identified and restored, others are doomed to disappear. The interior of the *Moulin d'Epesses* transformed by Alberto Sartoris into the *Cercle de l'Ermitage* in 1933 is only a short distance from *La Petite Maison*. From beneath the plastic decor of an old Vaud farmstead the architect is rescuing from oblivion the greater part of this stunning ensemble and intends to conserve it and fill in the missing parts: research and construction as a single act. There are sure to be other buried or tattered masterpieces out there waiting to be researched!

With any construction project affecting an "iconic" object there will be lectures and visits forming new milestones that give rise to new research and practice.

Using the construction phase for research is no easy matter, because if time, trials and reflections might be seen as enriching processes for those doing the work, clients and contractors tend to see them as holding the job up. To conclude, if there is one thing that ought to form a solid basis for further research — though it often fails to pass muster — it is the role of site documentation as a priceless body of knowledge of tremendous importance for the material history of any object undergoing conservation. ■

Notes

Text translated by David Mason.

- 1 Franz Graf, *Histoire Matérielle du Bâti et Projet de Sauvegarde. Devenir de l'Architecture Moderne et Contemporaine*, Lausanne, PPUR, 2014.
- 2 Client: Fondation Le Corbusier, Michel Richard, Director; Bénédicte

Gandini, architect; Franz Graf, conservation expert; Bernard Zumthor, federal expert; Glatz&Delachaux SA, architects.

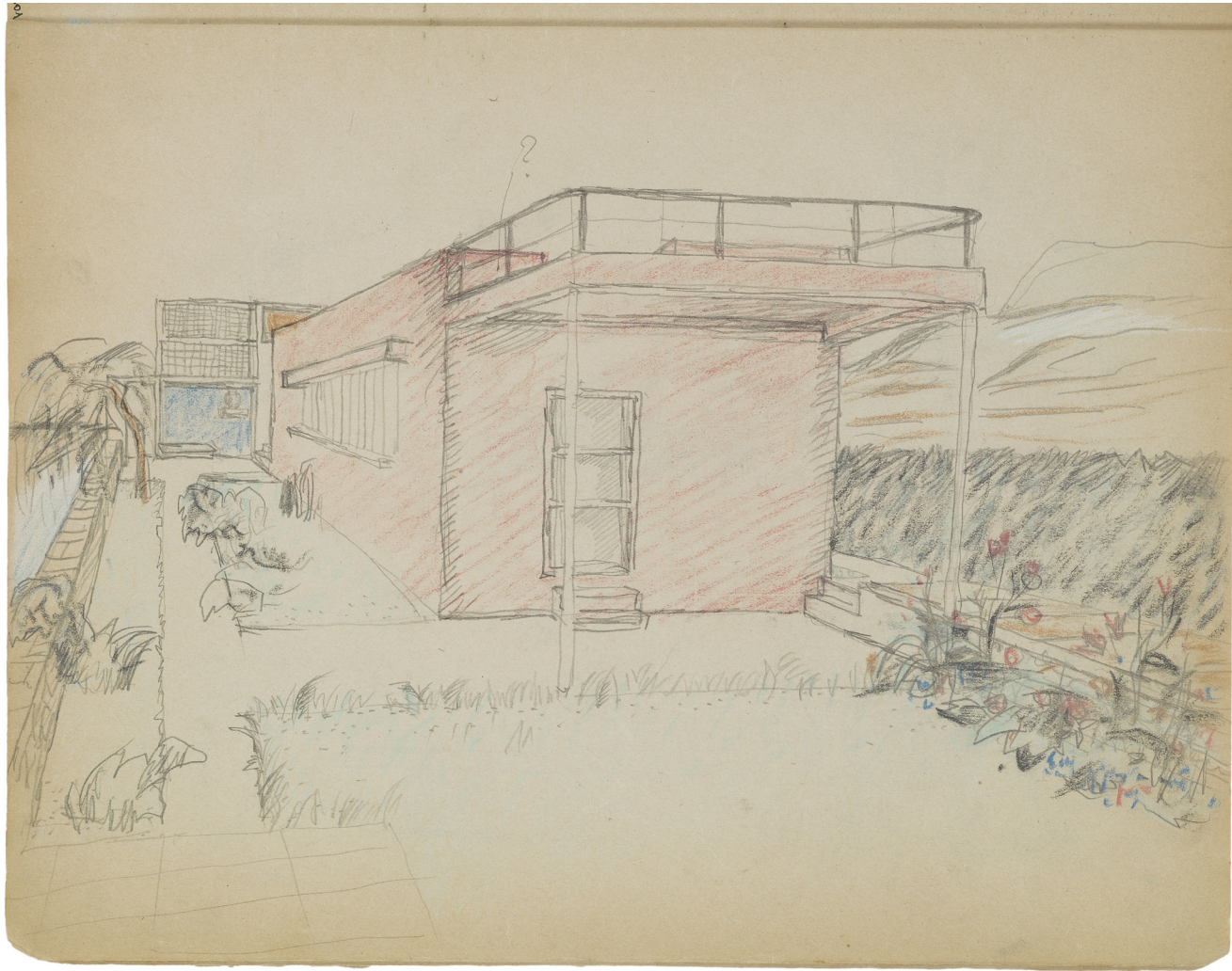
- 3 "I've been running around the country side which is covered in snow and rain, freezing and grim, looking for good plots. It's no joke, but my parents are so happy with the future house that I can endure it with pleasure", Elise Koering, *Villa Le Lac. Le Corbusier et Pierre Jeanneret, 1924, Corseaux. Etude Historique*, 2011. Students who took the exciting courses run by Jacques Gubler in the 1980s remember the long researches undertaken by LC to identify the right place to build the house.
- 4 Jean Badovici, "Entretiens sur l'Architecture Vivante. Maison au bord du lac Léman, 1924, par Le Corbusier et Pierre Jeanneret", *L'Architecture Vivante*, Autumn–Winter 1925, p. 30–32.
- 5 Elise Koering, *op. cit.*
- 6 *Idem.*
- 7 On the design influence of these constraints, problems and shortcomings on Le Corbusier's later work, see our interventions in *La Conservation de l'Œuvre reconstruit de Le Corbusier, L'Œuvre à l'Épreuve de Restauration*, XIX^e Rencontres de la Fondation Le Corbusier, 16–18, 2015.
- 8 Elise Koering, *op. cit.*
- 9 Le Corbusier, *Une Petite Maison*, Artemis, 1954.
- 10 Furalis an aluminum sheet cladding product patented by architect Joseph Furrer (1910–1976), *Fural* being an acronym of *Furrer* and *aluminum*. See Quaderno 01, *Deposito Avegno, 1953–1955*, *Architetto Rino Tami*, Franz Graf and Britta Buzzi, Mendrisio Academy Press, 2013.
- 11 See Plan 9419, dossier *Petite Maison*, Fondation Le Corbusier, Paris.
- 12 Le Corbusier, *op. cit.*
- 13 See Villa La Roche where renovation of the exterior has clarified the spatial perception internally.
- 14 See Plan 9419, *op. cit.*
- 15 The highest window in natural dark umber, loggia ceiling in brown, shutters in rather strong grey...
- 16 Le Corbusier, quoted in Elise Koering, *op. cit.*

Franz Graf

Architect from the École Polytechnique Fédérale de Lausanne (EPFL). Professor at the *Accademia di Architettura di Mendrisio* (2005) and at the EPFL. Since 2010 he has been President of **docomomo** Switzerland, and since 2012 member of the *Comité des Experts pour la Restauration de l'Œuvre of the Le Corbusier Fondation*. He is head of the Laboratory of Techniques and Preservation of Modern Architecture, at EPFL.

Giulia Marino

Master in architecture from the University of Florence and PhD in architecture from the *Ecole Polytechnique Fédérale de Lausanne* (EPFL). Since 2007 she has been a teacher and scientist at the Laboratory of Techniques and Preservation of Modern Architecture at the EPFL.



Le Corbusier, Villa Le Lac, Corseaux-sous-Vevey, Switzerland, 1924. Preliminary draft (Cahier n° 9),
Perspective of the villa pink. © FLC/SPA, 1924 (before November).

The villa *Le Lac* by Le Corbusier and Pierre Jeanneret at Corseaux-sous-Vevey. The Color Rediscovered

BY ELISE KOERING

In 2011, the *Fondation Le Corbusier* took the fortunate initiative of requesting a historical study prior to the restoration of the villa *Le Lac*, built in 1924 at Corseaux-sous-Vevey in Switzerland. Submitted in 2012, the study sought to provide objective and factual information about the construction and physical evolution of the building, by exposing the initial intentions of the architect and his wishes, fulfilled or not, for its transformation, restoration or improvement, through research in several archives (Fondation Le Corbusier, Communal Archives of Corseaux and Vevey, G.T.A. in Zurich, Cantonal Archives...). The Corbusean archives¹, as well as the local archives and several periodicals and reviews of the period, both French and foreign, were combed. The research, based mainly on primary sources, was completed by reading the writings of the architect, his contemporaries and historians². Having been carried out prior to the material analysis of the building³, the study revealed a series of new features of the house and its environs, including the garden⁴. Thanks to an analysis of the numerous documents mentioned above, an attempt to put photographs of this evolving building in chronological order was carried out with Bénédicte Gandini.

This article seeks to examine one of these new features⁵. A feature of fundamental importance as it calls into question a well-anchored myth and is connected to recent discoveries made during restoration works on Corbusean villas of the 1920s⁶.

The Myth of the “White Box”

The history of architecture has clearly established the principle of a white modernity, even though it is contradicted by the obvious variety of external colors on certain buildings and the restoration of others. Black and white photographs, the writings of Le Corbusier — of which one in 1923 rejecting Dutch experiments with polychrome exteriors⁷ — and the belated restoration campaigns, gave rise to a truncated Corbusean iconography, the myth of architecture without color.

Le Lac, considered by everyone as one of the first *white* villas, doesn't escape from this myth. It attached itself to *Le Lac* very early as a result of the distribution of black and white images, and the absence of comments on its color. The images deceived even those close to Le Corbusier, such as William Ritter who speaks in 1926 of a “pretty little shiny white box”⁸. Myth consolidated by the Corbusean restoration of 1951.

However, my research in the Corbusean archives has clearly established, for the first time, that the façades of the main house were not at all white but green. A discreet green, pale or even imperceptible in fine weather, as revealed by several letters and confirmed by stratigraphy. Whereas in 1924, Le Corbusier asks that “the color green appears in a minimal quantity”⁹, in 1951 the architect Emile André compares the house, even though it is still green, to a “delicious white rectangle”¹⁰.

The Choice of Green

“I would be very grateful if you could permit my father to have a definite place of shelter for his later years, in conditions that will allow him to satisfy his passionate love of nature”¹¹.

At the same time as he's offering a *stone*-colored layer to the façades of the houses Besnus, Ozenfant, *La Roche* or *Jeanneret* (later *Savoye*), which echoes the color of the surrounding houses¹², Le Corbusier decides to paint the main villa a color that has no connection with the local architecture.

The reason for this choice is without doubt to be found, not in the neighboring buildings, but in the natural environment of the *petite maison*. For his father, who is in love with nature, Le Corbusier has erected a villa in “a magnificent site”¹³. Set between the hillsides and the “splendid panorama of the lake and the mountains”¹⁴, it is thought in an abundant garden composed of grass, trees, shrubs, a vegetable patch and flowers. His father's passion for nature and Le Corbusier's desire to make the house part of a reflection about the *site* — also illustrated by the use of long window or roof-terrace¹⁵ — can thus explain the choice of a color with “suggestive value”¹⁶ (Figure 07).

However, the plan before November 1924 to make a villa pale pink¹⁷ — like the polychromy of the houses in Pessac and Boulogne (Lipchitz-Miestchaninoff) — clashed with this

01 Le Corbusier and Pierre Jeanneret, Villa *Le Lac*, Corseaux-sous-Vevey, Switzerland, 1924, © FLC/SPA, Certainly June 1925.



docomomo 53 – 2015/2

Essays



02 Le Corbusier and Pierre Jeanneret, Villa *Le Lac*, Corseaux-sous-Vevey, Switzerland, 1924–1925, garden and *mur brut* onto the lake, © FLC/SPA, 1925 (after April).

contextual interpretation because, far from integrating the building into its environment, pink detaches it from its environment and makes it stand out. Here, a *pictorial* interpretation — imagining the house and its site as a purist canvas — could resolve the enigma, as suggest Le Corbusier's comments on *Pessac*¹⁸ and especially this remark: “Lac Léman is gentle. Pale pearly blue complemented by pink to the east”¹⁹. Finally, we can add the importance of the relationship between the south façade and the lake, a façade-screen in which the water is reflected, their interplay accentuated by the addition of metallic scales in 1951²⁰.

Evolution of the Façades

From the Summer of 1923, Le Corbusier planned to build a small, “extremely economical”²¹ purist house for his parents, near Châbles-sous-Blonay where they were then living. After several months of research and the drafting of various plans for various sites²², Le Corbusier chose a piece of land on the edge of the lake, at Corseaux-sous-Vevey. After bitter negotiations, he convinced the owner, Julien Cornu, to sell his parcel²³, and his neighbors Vaudou to accept a plan to do the repairs to Bergère path that were necessary to build the house an acceptable distance from the lake²⁴.

The small house, named *Le Lac* at the end of 1925, is built between July and December 1924, its garden “completed” in April 1925. Of mixed construction (concrete-hollow bricks), *Le Lac* appears at first glance to be a *minimum* house, as comfortable and practical as a train coach: a machine for living²⁵. Its façades without cornices, and initially without awnings, exalt the edges and smooth surfaces of a “box lying on the ground”²⁶. A box that Le Corbusier wishes to be colored²⁷.

While a preliminary draft betrays his desire for a pale pink house, the letters exchanged with Colombo at the end of 1924 leave no doubt about the final choice of a green color. In November, the architect and the contractor considered applying this color to all of the façades of the house (200m²) and on the “side of the Vaudou property” to the west (35m²)²⁸. Le Corbusier imagines, with the painter Felli, using “lime with a bit of oil” tinted green and applied with a pump²⁹. But his absence from the site and an evident lack of communication caused Colombo, encouraged by Georges-Édouard, to paint the façades with a paintbrush. According to Colombo, lime applied with a pump to the façades without a cornice could not resist bad weather³⁰. He wrote: “As you want them to be green (which I consider a fine color [*couleur fine*]), to make the whitewash stick, we are obliged to apply it with a paintbrush”, after putting on a coating³¹. During this period, Le Corbusier prefers sole-tinted coatings (plaster-stone or cement coating) — villas *Besnus*, *La Roche*, *Jeanneret*, etc. — and everything seems to suggest that here he wished to mix the coating and the whitewash to make a single *skin*³². The analyses done by the SUPSI confirmed the presence of coatings on certain façades, and of one or several layers of green paint on the entire area of the façades³³.

To the green of the façades is added a range of colors, making the house a polychrome object. While the soffit of the shelter (or *loggia*) is dark red or the gate of the roof-terrace and the metal closing-opening³⁴ of the east façade are

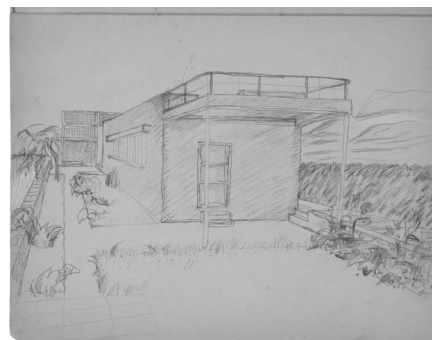
brown, the railing of the shelter is white, according to the stratigraphy, like its metallic columns³⁵.

Still ignoring Le Corbusier's advice, Colombo turns to a silicate paint for certain architectural features (parapet of the roof-terrace, chimney shafts, shutters, box, shelves...) and surfaces (especially cement), such as the planks of pre-fabricated cement of the wall to the east (blue in the first draft and finally painted red-brown) and its cement posts³⁶. The “crude wall” (*mur brut*) or “heightened wall” giving onto the lake (of which the exterior façade was to be painted “dark red”) is finally painted with white lime, despite the insistence of Colombo that silicate be used, his reason being once again the fragility of lime whitewash: “It is certain that after the first rain nothing will be left”³⁷. During this period, Le Corbusier uses silicate, especially in the villas Lipchitz-Miestchaninoff, even though he seems to prefer lime³⁸.

It can be seen that polychromy makes the house an object that is both autonomous and inscribed in an architectural and natural environment³⁹.

Completed at the end of 1924, the villa is subjected from its first year of occupation to the outrages of a constant enemy: humidity. The proximity of the lake, “the rise and fall of its waters”⁴⁰, causes infiltrations, obliging the architect to make frequent repairs⁴¹. Suffering from the same symptoms — “being permanently cracked”⁴² —, the roof-terrace and the façades are the subject of many interventions, often affecting both at the same time. From April 1925, “small cracks”⁴³ appear; in October, the first program of repairs and improvements is carried out. Le Corbusier adds *marquises* (awnings) above the entry doors⁴⁴ of the north façade which is cracking. After “filling the cracks”, the façade is repainted with oil paint (certainly green)⁴⁵. The windows are sealed, the bottoms of the entry doors — henceforth fitted with joint covers⁴⁶ — are repainted an unknown color. Finally, a double roll-up door is installed in the shelter. Several months later, the first repairs are made to the roof-terrace⁴⁷.

After strong rains in 1927, the foundations of the house move and “vertical cracks [appear] in the transverse walls and in the interior”⁴⁸. Water-proofing work is done to the roof-terrace before applying a white lime milk that is supposed “reflect the rays of the sun”⁴⁹. The cracks are filled “with Alucol and cêruse”⁵⁰, which makes it necessary to repaint (oil paint) one or several façades — certainly only the north façade according to the drawing of 1927.

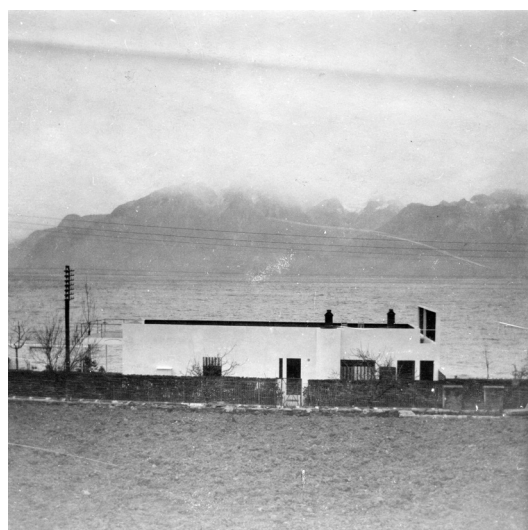


03 Le Corbusier, Villa *Le Lac*, Corseaux-sous-Vevey, Switzerland, 1924. Preliminary draft (*Cabier* n°9), Perspective of the villa pink. © FLC/SPA, 1924 (before November).

04–05 Le Corbusier and Pierre Jeanneret, Villa *Le Lac*, Corseaux-sous-Vevey, Switzerland, 1924, North façade before and after the metallic recovering and the construction of the wall on the road in 1931, © FLC/SPA, 1925 (between April and October) and 1932 (after May).



06 Le Corbusier and Pierre Jeanneret, Villa *Le Lac*, Corseaux-sous-Vevey, Switzerland, 1924, North façade with the new wall on the road, © FLC/SPA, End of 1931/beginning of 1932.



07 Le Corbusier and Pierre Jeanneret, Villa *Le Lac*, Corseaux-sous-Vevey, Switzerland, 1924, © FLC/SPA, 1925 (before October).

Restoration of the Façades and New Polychromy

The original color of the house has essentially been forgotten because of the re-covering [covering *Revêtement*] works of its façades in 1931 and 1951, and its being repainted in 1951.

After two programs of repairs that were obviously ineffective, in 1931, Le Corbusier takes the radical decision to insulate the north and west façades with bands of galvanized iron similar to the “shingles of galvanized steel, commonly used to keep out bad weather on the farms of Haut-Jura”⁵¹ (Figures 04–05). At the same time, he erects an annex and a wall on the road (cement-hollow bricks) (Figure 06), the inner and outer sides of were rough and painted white, while the top remains unpainted⁵². The beam, letter box, and gate seem to have been painted with two tones of grey⁵³. Moreover, it is highly probable that on this occasion the east façade is repainted⁵⁴.

In the 1940s, Marie-Charlotte-Amélie complains about “a constant humidity in the north and the west”. Inside, water streams down the walls, the varnish peels off, the linoleum “swells and explodes in many places”⁵⁵. In 1941, the weeping willow to the west is cut down. In 1945, the roof-terrace is repaired again with, if we believe Marie-Charlotte-Amélie, “asphalt and asphalt paper”⁵⁶.

By the end of the decade, roof-terrace and south façade are nonetheless in a deplorable state (Figure 07). The cracks causing leaks are multiplying and “cracking the parapet of the terrace almost to the level of the box housing the rolling shutters”; the bottom of the parapet “is clearly detached from the reinforced concrete slab”⁵⁷. At the end of 1950, a new program of works is begun to insulate the roof-terrace and protect the south façade. After enquiring about the cost of covering it with Eternit⁵⁸, Le Corbusier returns to his initial position⁶⁰ by choosing to cover the façade with bands of aluminum sheet of the brand FURAL (Figures 08–09). An aluminum sheet, molded and matte, five millimeters thick, covers the whole of the façade giving onto the lake⁶¹. For Émile André “the effect is [...] very good”⁶².

At the same time, Le Corbusier defines a new exterior polychromy, which is only known through the content of two letters and a series of annotated drawings from April 1951⁶³. Intended for the parts that have been left uncovered, for the metal closing-opening elements and shutters, this polychromy is dominated by white, which covers in particular the last façade that is still green⁶⁴. 1951 thus sees the final disappearance of the original color, which had been preserved on the south and east façades, as evidenced by a note of Le Corbusier — “This wall white (instead of green)”⁶⁵ — and the comment made by Albert regarding the recovering of the south façade: “What would you think of the sage-green [*vert cendre*] on p. 19? It would be like the current façade”⁶⁶.

Published in its new attire in 1954, with no reference to its original *skin*⁶⁷, the *petite maison* finally enters the reality of the *white* (and metallic) *villa*, until then a myth which has today been deconstructed. ■

Notes

This text was translated from the French by Professor Robert Wintemute.

- 1 Drawings, notes, estimates, bills, brochures, diary of his father, correspondence, old photographs, etc.
- 2 See in particular Bruno Reichlin, “La petite maison à Corseaux. Une analyse structurale”, *Le Corbusier à Genève 1922–1932. Projets et Réalisations*, Lausanne, Payot 1987, p. 119–134.
- 3 Stratigraphic study of the polychromies carried out by the Atelier Saint-Dismas.
- 4 See also the study of *L'Atelier du Paysage Jean-Yves Le Baron Sàrl*, landscape architects.
- 5 For the full text of the study, see Elise Koering, *Villa Le Lac de Le Corbusier et Pierre Jeanneret à Corseaux, Suisse. 1923–1924. Étude Historique pour la Restauration*, Paris, Fondation Le Corbusier, 2011–2012 (unpublished).
- 6 See in particular Agence Pierre-Antoine Gatier, *Maison La Roche, Paris 16e. Étude Préalable: Restauration Générale de l'Édifice* (Research and Text: Bénédicte Gandini), Février 2006 and *Étude Préalable à la Restauration des Façades des Maisons La Roche et Jeanneret et des Espaces Extérieurs. Rapport*, Avril 2011, completed by a stratigraphic study of Ariel Bertrand, restorer.
- 7 Le Corbusier, “Salon d'Automne (Architecture)”, *L'Esprit Nouveau*, No. 19, Décembre 1923.
- 8 Ritter to Le Corbusier, 25.05.1926. FLC-R3(13). To our knowledge, no book or article of that period (French, Swiss or German) and nothing published by Le Corbusier about Le Lac mention the color of the house's exterior.
- 9 Le Corbusier to Albert Colombo (contractor), 08.12.1924. FLC-H1(5)136.
- 10 André to Albert Jeanneret, 25.01.1951. FLC-H1(5)345.
- 11 Le Corbusier to Monsieur Cuénod, 21.09.1923. FLC-H1(5)50.
- 12 This tone was created by applying several kinds of imitation stone coating such as Cimentaline or Jurassite. These coatings, often polished sometimes painted (Ozenfant), were also planned for the Guette house and unbuilt projects such as a garage and the Villa Meyer.
- 13 Le Corbusier, *Précisions sur un État Présent de l'Architecture et de l'Urbanisme*, Paris, Vincent&Fréal, 1930, p. 130.
- 14 Jean Badovici, “Maison au Bord du Lac Léman, 1924, par Le Corbusier et P. Jeanneret”, *L'Architecture Vivante*, Hiver, 1925, p. 32.
- 15 “The window is 10.75m long. In winter the site “is there” as if one was in the garden. So the days are not sad anymore: from dawn until dusk, nature deploys its metamorphoses”. Le Corbusier, *Almanach d'Architecture Moderne*, Paris, 1926, p. 94.
- 16 “Monsieur Giedion having expressed his regret that we did not consider it possible to include the terms “sand”, “wall”, “sky” in the published collection of the work of “Le Corbusier/Salubra”, I must tell you that these terms — of which I understand perfectly the suggestive value — could very well appear in the explanatory texts...”. MR (Salubra) to Le Corbusier, 15.05.1931. FLC-B1(18)3. “It had to be built in harmony with the splendid panorama of the lake and the mountains and in such a way that, from the windows, the view would encompass the broadest horizon possible”. Jean Badovici, op. cit. Pale green was used in particular in interiors such as those of Auteuil (“English green”). Célio to Le Corbusier, 12.03.1925. FLC-H1(3)254. A sketch of the gardener's lodge of the Savoye villa (27.05.1930) also refers to a “pale English green n° 2” (as well as to a “dark green” and to a “dark grey”). FLC 31871. Thanks to Bénédicte Gandini for showing me this sketch.
- 17 FLC-Cahier n°9/FLC09419.
- 18 “Optical illusions are playing, impressions are multiplying, it has enormous joy, but a certain firmness”. Le Corbusier to Marie-Charlotte-Amélie Jeanneret, 26.05.1926. FLC-R1(6)125-126.
- 19 Le Corbusier to M-C-A.J., 28.08.1933. FLC-R2(1)194. We must stress here the choice of a blue color on the east and west walls, complementary of the pale pink of the façades.
- 20 “This façade is sumptuous. Seen from quite close, in the morning, lit up, it was so joyful and vigorous, remarkably animated by the play of the shadow on the horizontal streaks. In the evening, with no direct light, this façade was clear and so airy”. André to Le Corbusier, 25.05.1952. FLC-H1(5)380.
- 21 “It's a question of [...] demonstrating value for money”. Le Corbusier to the contractors Boulénaz, Colombo, Zuretti, 10.01.1924. FLC-H1(5)2/H1(5)4/H1(5)57.
- 22 See especially FLC-Cahier No. 9. Also Rodolfo Corrente, “*Cabier de Dessins No. 9: 'ici: de page 3 à page 75 recherches pour un terrain pour la maison 'Le Lac' jeanneret-perret*”, Massilia, 2005, p.18–31.



08 Le Corbusier and Pierre Jeanneret, Villa *Le Lac*, Corseaux-sous-Vevey, Switzerland, 1924, South façade with cracks, © FLC/SPA, between 1941 and 1951.



09–10 Le Corbusier and Pierre Jeanneret, Villa *Le Lac*, Corseaux-sous-Vevey, Switzerland, 1924. South façade before and after the metallic recovering in 1951, © FLC/SPA, 1925 (after April) and Eric Ed. Guignard, 1987

- 23 Research in the communal archives revealed that Le Corbusier owned a considerable number of plots of land in Corseaux-sous-Vevy.
- 24 Plan permitting the construction "to be moved back by one metre". Le Corbusier to Vaudou, 27.06.1924. FLC-H1(5)94.
- 25 "We drew up a rigorous plan for the house, functional and responding exactly to the programme". Le Corbusier, *Œuvre Complète*, 1910-1929, Zurich, Girsberger, 1960, p. 74.
- 26 Le Corbusier, *Une Petite Maison*, Basel, Birkhäuser-Publishers for Architecture, Fondation Le Corbusier, 2001 (1954), p. 10.
- 27 Obviously colored in the interior too with a range of colors that is still not well known today (white complemented by purist shades).
- 28 Estimate of Colombo, 22.11.1924. FLC-H1(5)128.
- 29 Le Corbusier to Colombo, 24.11.1924, 08.12.1924. FLC-H1(5)131/H1(5)136. "The estimate was made for lime milk paint, with a pump". Georges-Édouard Jeanneret to Le Corbusier, 28.12.1924. FLC-R1(7)17.
- 30 "Would you have expected so many difficulties: the paint on the exterior remains despite the absence of any protection (pre-roof, etc.) against rain and bad weather!". G-É. Jeanneret to Le Corbusier, 28.11.1924.
- 31 This choice increases the price of the work. "I [?] you to apply this whitewash with a pump, as you had planned and I am sure that the lime mixed with oil will produce a satisfactory result [...]. Idem Façade Vaudou". Le Corbusier to Colombo, 08.12.1924. Op. cit. "Not having received your reply, we have done the work as planned with a paint-brush". Colombo to Le Corbusier, 12.12.1924. FLC-H1(5)138.
- 32 "In the month of September, before my departure and before the coatings had begun, I had proposed to give you the tone of tinted lime so that it could be applied the same day as the coating. You told me that you preferred to have the painting done once the coating was finished". Le Corbusier to Colombo, 24.11.1924, op. cit.
- 33 *Scuola Universitaria Professionale della Svizzera Italiana, Indagini Sulle Policromie Esterne*, 2014. Thanks to Giacinta Jean and Francesca Piqué.
- 34 The metal work of the windows or the doors.
- 35 Le Corbusier to G-É. Jeanneret, 28.01.1925. FLC-H1(5)143. The frames of windows of the north and south façades seem to be clear grey.
- 36 Yellow or ochre? The planks of Vaudou's common wall, planned to be blue and brown-red, are finally painted brick red without silicate (SUPSI). On the side of the external staircase, the wall is probably an ochre. The trellises of the battens of larch are painted later with an unknown color. On 7 August 1925, Georges-Édouard writes to his son: "Could you tell me what color we should varnish the lathing of the great wall..." FLC-R1(7)20.
- 37 Colombo to Le Corbusier, 28.11.1924, op. cit.
- 38 Potassium silicate (also called liquid glass) is a non-organic mineral binding agent with extremely long adherence, making the paint more durable.
- 39 The doors on the edge of the lake, allowing customs officials to enter, were planned to be white [Le Corbusier to G-É. Jeanneret, 28.01.1925. FLC-H1(5)143], but certain photographs reveal a dark color, certainly a red-brown. They are replaced in 1956 by doors made of Eternit.
- 40 Le Corbusier to André (?), 28.11.1950. FLC-H1(5)332.
- 41 On 3 November 1924, Georges-Édouard writes to Le Corbusier: "It has been raining heavily for forty-eight hours [...]. The external staircase is causing water to seep into the basement". FLC-R1(7)16. In January 1925, he complains about the humidity in the laundry where the linoleum already seems to be coming off. Le Corbusier declares: "There is no house that is built more soundly than yours and all these questions of future leaks, future condensations are something that has been stuffed into your head to make you accept the badly installed linoleum..." The future would constantly prove him wrong. Le Corbusier to G-É. Jeanneret, 28.01.1925. FLC-H1(5)143.
- 42 Le Corbusier to Albert Jeanneret, 28.11.1950. FLC-H1(5)332.
- 43 G-É. Jeanneret, Diary, 08.04.1925. FLC-R1(2)433.
- 44 The awning of the service door is removed during the works of 1931-1932.
- 45 G-É. Jeanneret, Diary, 22.10.1925. FLC-R1(2)443.
- 46 Because "strong rain penetrates the inside, forming puddles that can no longer be tolerated, without considering that they completely damage the paint on the doors". G-É. Jeanneret to Le Corbusier, 07.08.1925, op. cit.
- 47 Le Corbusier to M-C-A.J., 01.05.1926. FLC-R1(6)121.
- 48 Le Corbusier, Note and Drawing, 1927. M-C-A.J. to L.C., 05.09.1927. FLC-H1(5)405/R1(7)51.
- 49 Le Corbusier to Colombo, 06.10.1927. FLC-H1(5)406.
- 50 Le Corbusier, Note and Drawing, op. cit. Alucol is made of aluminium and lead, whereas ceruse is a pigment of white lead.
- 51 Confirmed by the bill, the estimate of the firm Felli&Fils stipulates: tiles of galvanised iron, window trim, buffering, panelling and window sills. 19.08.1931, 25.08.1932. FLC-H1(5)235/H1(5)260. L.C., *Une petite maison*, op. cit., p. 24.
- 52 Le Corbusier writes: "Felli can finish the coating of the closing wall and whiten it with lime (white lime, pure)". His sketch has the following annotation: interior wall "in white", "the edge white", the interior of the east wall "to be painted white". Le Corbusier to M-C-A. Jeanneret, 07.10.1931. FLC-R2(1)132. He insists that the "top of the new cement wall remains the color of natural cement". But Felli fears that the "first rain" will make the covering disappear. A letter in December refers to lime milk on the inner side and paint, on the outer side of the wall and on the gate. Felli's bill confirms the painting without indicating the colors and the types of paints. 25.08.1932. FLC-H1(5)260.
- 53 The gate was to be "clear grey (the inside in dark grey)", the metal beam dark grey Le Corbusier to M-C-A. Jeanneret, 1931. FLC-R2(1)120. In the photographs that are taken after the works were completed, the letter box appears to be painted in clear grey, the gate and the metal beam in dark grey.
- 54 *Idem*.
- 55 M-C-A. Jeanneret to Le Corbusier, 12.03.1941. FLC-R1(7)96.
- 56 M-C-A. Jeanneret to Le Corbusier, 08.05.1945. FLC-R1(7)110.
- 57 Établissements Meynadier to Le Corbusier, 24.11.1950.
- 58 Meynadier provide "reinforced waterproof insulation". Bill, 29.03.1951. FLC-H1(5)364. See Koering, op. cit.
- 59 "The effect would be harmonious. [...] It's always made me feel bad to see this clear façade marked by the planned covering of sheet metal. I did it reluctantly. Conserving this work in its original purity counts for something all the same. One of the few witnesses of contemporary regional architecture". André to Albert Jeanneret, 25.01.1951. FLC-H1(5)345. His opinion is shared by Albert who fears the effect of a "block or blockhaus" engendered by the sheet metal: "It also seems to me that, in fact, a white stain, lightly softened [façade with Eternit], would be a work of mercy". Albert Jeanneret to Le Corbusier, 26.01.1951. FLC-H1(5)344.
- 60 "The only solution that appeared to me is to cover the south façade in the same way as the north façade with the same tiles of galvanised sheet metal". Le Corbusier to Albert Jeanneret, 28.11.1950. FLC-H1(5)332.
- 61 "Long bands of alloy Aladur-15, transversally fluted". Adolphe Stiller, "Une descente sur les lieux: Construction et détails techniques de la Petite Maison", Le Corbusier à Genève 1922-1932. op. cit., p. 135-142, p. 141. Works carried out by Von Gunten&Savary. FLC-H1(5)353. Le Corbusier also asks *L'Aluminium Français* to investigate possible façade covering tiles, both in terra cotta and in galvanised sheet metal. Letter of H. Bellin (*L'Aluminium Français*), 09.02.1951. FLC-H1(5)351.
- 62 André to Le Corbusier, 25.04.1951. FLC-H1(5)593.
- 63 Le Corbusier to Albert and M-C-A. Jeanneret, 24.04.1951. André to Le Corbusier, 25.04.1951. Le Corbusier, "Le Lac. Couleurs", 25.04.1951. FLC-H1(5)411/H1(5)593/H1(5)407.
- 64 Certain colors are conserved, such as the white of the railing on the roof of the loggia and the dark red of its ceiling. Le Corbusier, "Le Lac. Couleurs", op. cit. "The windows should be as they were before: the wood should be in white (if I'm no mistaken)". Le Corbusier to Albert and M-C-A. Jeanneret, op. cit. For the detail of this new polychromy, see Koering, op. cit.
- 65 Regarding the east wall, Le Corbusier, "Le Lac. Couleurs", op. cit.
- 66 Albert Jeanneret to Le Corbusier, 30.01.1951. FLC-H1(5)348.
- 67 Le Corbusier, *Une Petite Maison*, op. cit.

Elise Koering

(b. 1976, France). Associate Researcher, at the *Laboratoire Conception, Territoire et Histoire, École d'Architecture et de Paysage de Lille (LACTH)*. PhD in History of Architecture, Université Versailles-Saint-Quentin-en-Yvelines — Eileen Gray et Charlotte Perriand dans les années 1920 et la question de l'intérieur corbuséen. *Essai d'analyse et de mise en perspective*. Library Research Grant. Getty Center, Los Angeles; Jeunes Chercheurs Grand Fondation Le Corbusier, Paris.



Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949–1955. Living-dining room with double height. © Mario Retik, September 2014.

Maison Curutchet, La Plata, Argentina

BY JORGE NÉSTOR BOZZANO AND JULIO SANTANA

The *Maison Curutchet* is the only house by Le Corbusier in America. The project was developed between 1948 to 1949 and built between 1949 to 1955 as a single-family dwelling and as a professional medical office to the well-known Dr. Pedro Domingo Curutchet in La Plata, Buenos Aires.

In 2013–2014, *Colegio de Arquitectos de la Provincia de Buenos Aires* (CAPBA) which head office is settled there, decided to carry out a full maintenance, done with the strict criteria of minimizing the impact on the house and using as reference the original documentation.

The process was coordinated by CAPBA's Enhancement Research Institute, led by the architect Pablo Mastro-pasqua, and directed by the architect Julio Santana.

Le Corbusier and Argentina

The relationship between Le Corbusier and Argentina began in 1928, when the writer Victoria Ocampo commissioned him to design a house and a small-scale building in Buenos Aires. For various reasons, they were never realized. With his journey to South America in 1929 and his presence in Argentina's capital — encouraged by *Amigos del Arte Association* — and his attendance at a series of conferences he cemented his contact with numerous people. As a result, he was asked to design the Martínez de Hoz House in Buenos Aires and the Errázuriz House in Chile, neither of which were built.

In 1937 two young Argentine architects, Juan Kurchan and Jorge Ferrari Hardoy, had the chance to collaborate at Le Corbusier's studio in Paris where they were entrusted with Buenos Aires' urban planning. In the end, the project was not realized.

One decade later, Pedro Domingo Curutchet — a well-known surgeon — contacted Le Corbusier through his sister, Leonor, to commission a combined single-family dwelling and professional medical office. The project was located in La Plata (the capital of the Buenos Aires province), seventy kilometers from the Argentine capital. The response arrived immediately: "Your program, a doctor's house, is extremely attractive from a social point of view. I am interested in the idea of making your house a domestic masterpiece with simplicity, functionality and harmony".

That was the beginning of an exchange of letters until 1949, when Le Corbusier and his team members — André Wogenscky, Roger Aujame and Bernard Horsli — resolved the design. The design drawings of the building were sent to La Plata suggesting several candidates for construction manager. Dr. Curutchet chose Amancio Williams, a young architect who, with unusual enthusiasm, undertook the realization of the construction plans, in constant consultation with Le Corbusier. The construction began one year later.

Materialization and Usage

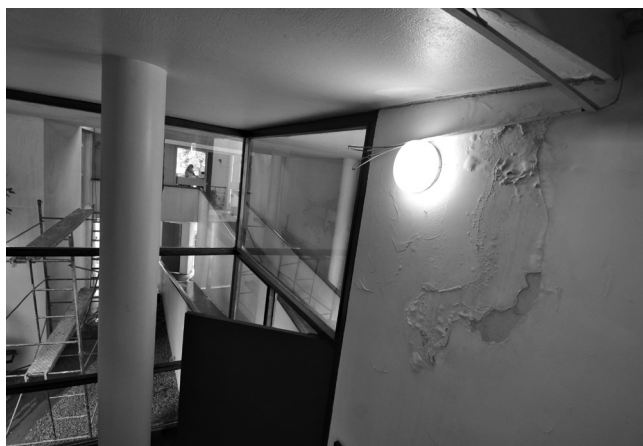
The execution of the project was assigned to Amancio Williams, who realized Le Corbusier's design proposal as accurately as possible. He made many sketches and construction drawings in order to realize the preliminary design. Works were considerably delayed by this process and the owner decided to change his construction supervisor to the architect Simón Ungar with the engineer Alberto Valdes. Architect Nereida Bar was in charge of the garden design. Finally the house was completed and immediately occupied by the doctor's family, although for only a short time. Afterwards the house was occupied by a building manager for several years during which time it fell into disrepair.

A Little Big Masterpiece

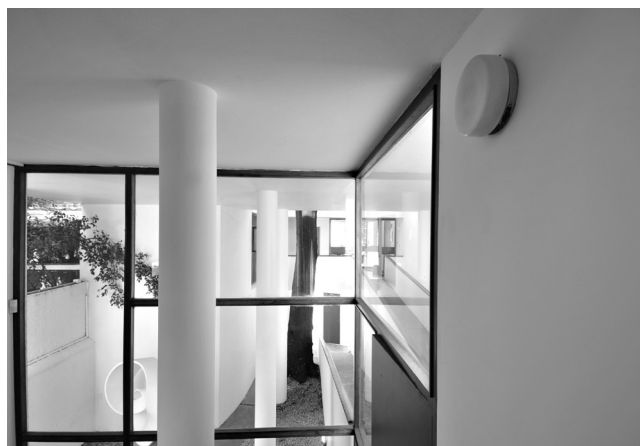
The architectural program, which comprised a house for a couple with two daughters and a professional medical practice, is located on a narrow, sloping lot with a 9 metre frontage and a depth of 20 metres, facing a public square which opens onto the city park.

The living and working quarters had to function independently, for which reason Le Corbusier defined two volumes that were separate and yet connected at the same time. On the ground floor the garage is at the front and the service areas are at the back. The only pedestrian entrance, for both the house and the medical practice, is a ramp which acts as both a circulation system and a composition articulator of the ensemble.

The ramp climbs up from the street and at the first intermediate landing there is the generously glazed hall of the residence, which contains the stairs leading to the upper floors. Turning back towards the street, the ramp leads to the mezzanine which contains a waiting area and the medical consultation room. They occupy the entire width of the lot, and open to the park through a generous glass window. In front of it, there is a *brise-soleil* that consists of a rectangular



01 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949 - 1955. Access hall from the street. © Mario Retik, February 2014.



02 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949 - 1955. Access hall from the street. © Mario Retik, November 2014.

grid framework that continues up to the rooftop family garden terrace. The medical intern's accommodation on the mezzanine has independent access and views into the interior courtyard.

The stairs from the access hall to the residential area reach the first floor which contains the lounge and dining areas as well as the outdoor terrace. The stair hall gives separate access to the kitchen (for servants) and to the formal rooms (for family and guests). A double-height void above part of the lounge area allows a visual relationship with the upper floor where the bedrooms are located.

There are blade walls on the side boundaries, even though the structural system consists of reinforced concrete slabs and free-standing columns that are separate from both the boundary and internal walls and both the columns and the curved and straight internal walls between rooms are free to play with space.

Part of the furniture is built in under the windows or with the walls, integrating it thoroughly with the architecture.

The garden terrace is directly related to the living room, a part covered with a high concrete canopy that is in dialogue with both the *brise-soleil* and the higher house next door.

In the open central space that penetrates the building between both volumes, Curutchet planted a tree, following Le Corbusier's suggestion. It converses with the ramp, a real architectural promenade, with a play of views that open in multiple directions. A small sinuous path leads to the Ground Floor service areas and, along with the garage, there is a sculpture by Enio Iommi, that speaks of space, the movement of the plane, time, surface and light.

Seen from the park, *Maison Curutchet* stands out for the access door framed by a generous concrete splayed rectangular frame, contrasting with the rest of the framework that forms a subtle metal grid. The grid of the *brise-soleil* continues up to the rooftop garden terrace's concrete canopy which reaches the height of the Italianate style house next

door. On the opposite side, the boundary wall is hollowed out with an opening to the garden of the neighbor's house, designed by the Hungarian architect, Andres Kalnay, in a style between rationalist and art deco. This is how *Maison Curutchet* accomplishes a subtle dialog with the contiguous buildings and is an exemplary answer by modern architecture to the inherited surroundings. The use of the Modulor system for controlling measures, co-ordinating details, the well thought-out services installations, the maximum usage of views to the park, reaffirms the house's greatness.

In the house it is possible to clearly appreciate the re-formulation of the *Five Principles of Modern Architecture* that Le Corbusier announced two decades before designing it. Therefore, the open floor plan, the *pilotis*, the free facade, the strip window, and the roof terrace are all expressed in *Maison Curutchet* with the same strength that they are expressed in the emblematic *Ville Savoye* in Poissy.

Actions around the Building

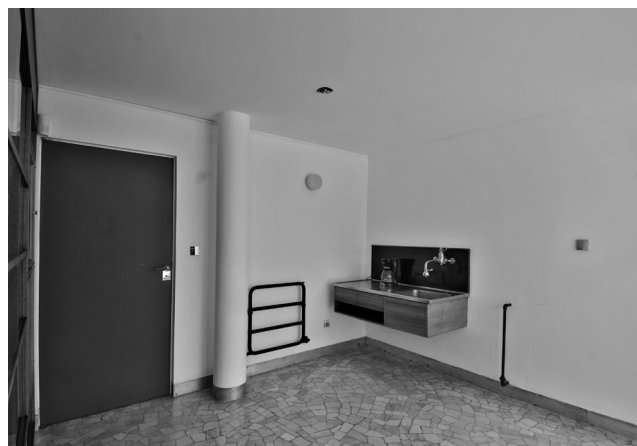
In the 1980s negotiations began in order to recover the use of the house. Finally, in 1987, the house was declared a National Historical Landmark by resolution No. 2335, which was later ratified by decree N° 890/2006. In that context, Curutchet decided to rent the building to his friend Doctor Federico Christmann, a well-known surgeon in La Plata, with the aim of starting a Foundation. The first renovation project was under the charge of Luis and Julio Grossman, and for a short period of time, the Christmann foundation undertook a series of cultural activities.

In 1991 the house was rented by *Colegio de Arquitectos de la Provincia de Buenos Aires* (CAPBA), a body that represents fourteen thousand architects, and established there its first institutional and administrative head office. This institution has directed, executed and financed the maintenance and enhancement of the building ever since.

As CAPBA consolidated, the number of visitors to the house motivated the idea of moving the College's admin-



03 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949 - 1955. Doctor's office. © Mario Retik, February 2014.



04 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949 - 1955. Doctor's office. © Mario Retik, February 2014.

05 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949 - 1955. Railing ramp. © Mario Retik, February 2014.



06 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949 - 1955. Railing ramp. © Mario Retik, November 2014.



istration office, leaving the house for individual and group visits only. CAPBA bought two adjoining properties, where the new administrative office was relocated.

In 2009 the fiction film, *El Hombre de al Lado*, written and directed by Gastón and Andrés Duprat (the second of whom is an architect) and Mariano Kohan was filmed in the house. The movie was a big success and received several awards in International Festivals.

Growing appreciation towards cultural assets and the influence of the film increased the number of people visiting the house, going beyond academic and professional circles.

This motivated CAPBA to elaborate an enhancement plan to both answer and, at the same time, to question society's link with the *Maison Curutchet*.

This plan has three main working areas that gain focus at various times: added cultural value, added building value, added academic value.

Cultural Value Plan

Since 2011 it has been decided to assist artists from various disciplines who felt motivated by the house and by Le Corbusier's architecture.

From that idea of participation and openness, a call was made — started by architects but also including anyone who may be interested — to submit their proposals and initiatives, where the CAPBA had the roll of a curator.

The selection of proposals is based on three main criteria:

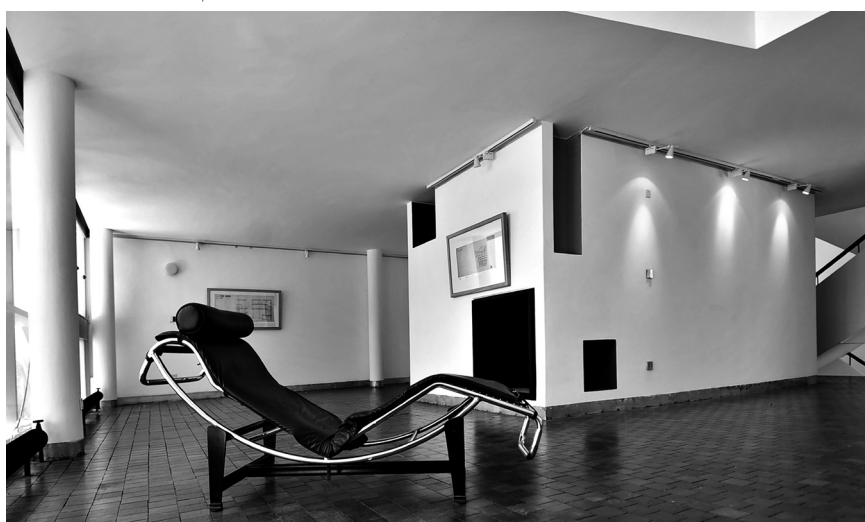
- Activities inspired by the *Maison Curutchet* and/or by Le Corbusier's work.
- Activities that articulate different disciplines.
- Collective activities over individual ones.

Among multiple activities already undertaken, it is worth highlighting the theatrical play, *El Espacio Indecible* which has had three successful seasons from 2013 until now. The play was created by the playwright Nelson Mallach and Roxana Aramburú to be exclusively played at the *Maison Curutchet*. It is about how Corbusian architecture increased after World War One, *IMBUIDO*/inspired by Balzac and Proust's spirit, about how ideas finally reached South America; about the master's relationship with Josephine Baker, his regular days in his Parisian studio and his time in the Cabanon at Cap Martin. Everything is modulated by French songs and by a theatrical tour to different areas of the house.

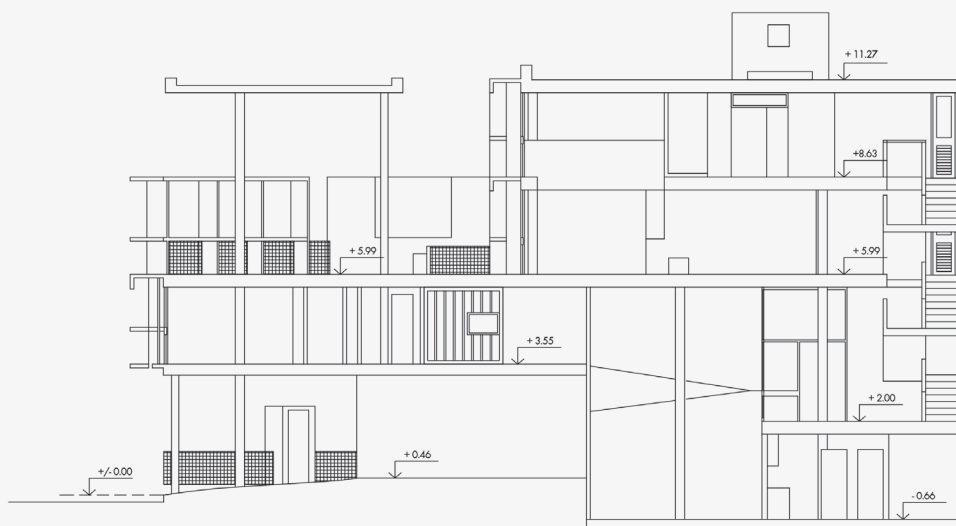


07 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949 – 1955. View to the park through the *brise-soleil* of the garden terrace. © Julio Santana, September 2014.

08 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949 – 1955. Living-dining room with double height.
© Mario Retik, September 2014.



09 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949 – 1955. *Brise-soleil*, canopy and tree, from the garden terrace. © Mario Retik, September 2014.



10 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949–1955. Section.

Several art exhibitions have taken place at the house. It is worth mentioning the one which brought together thirty well-known Argentinian architects who interpreted the *Maison Curutchet*, each one with a freedom of technique and materials. Some of the participants were Justo Solsona, Roberto Frangella, Isaac Rasdolsky, Sandro Borghini, and Miguel Jurado.

Dance was another discipline that has been inspired many times by the house, making the body move — from classical to contemporary dance or tango — playing with geometry, volumes and surfaces of the house. One of these performances — directed by the choreographer Florencia Olivieri — was supported by the National Endowment for the Arts.

Documentaries have their place too: in 2012 and 2013 *La Máquina de Habitar* by Bruno Garritano and *Amancio Williams* by Gerardo Panero were filmed there.

Additionally, conferences, talks and seminars have been given at the *Maison Curutchet* by prestigious Argentinian and foreign architects and town planners. Many of them have been broadcast through a modern teleconference system installed at the house.

The house also participates in *La Noche de los Museos*, an activity organized by the Cultural Institute of Buenos Aires in which, every year, the *Maison Curutchet* has an outstanding participation by hundreds of people inspecting the house in one night.

All this year and especially after July, numerous activities will take place in order to commemorate the fiftieth anniversary of the moment when Le Corbusier drowned off Cap-Martin.

For these activities different countries' embassies that normally organize activities at the house have been invited

— such as the Swiss and French embassies to Argentina; countries where the Master was born and lived.

The Building's Value Plan

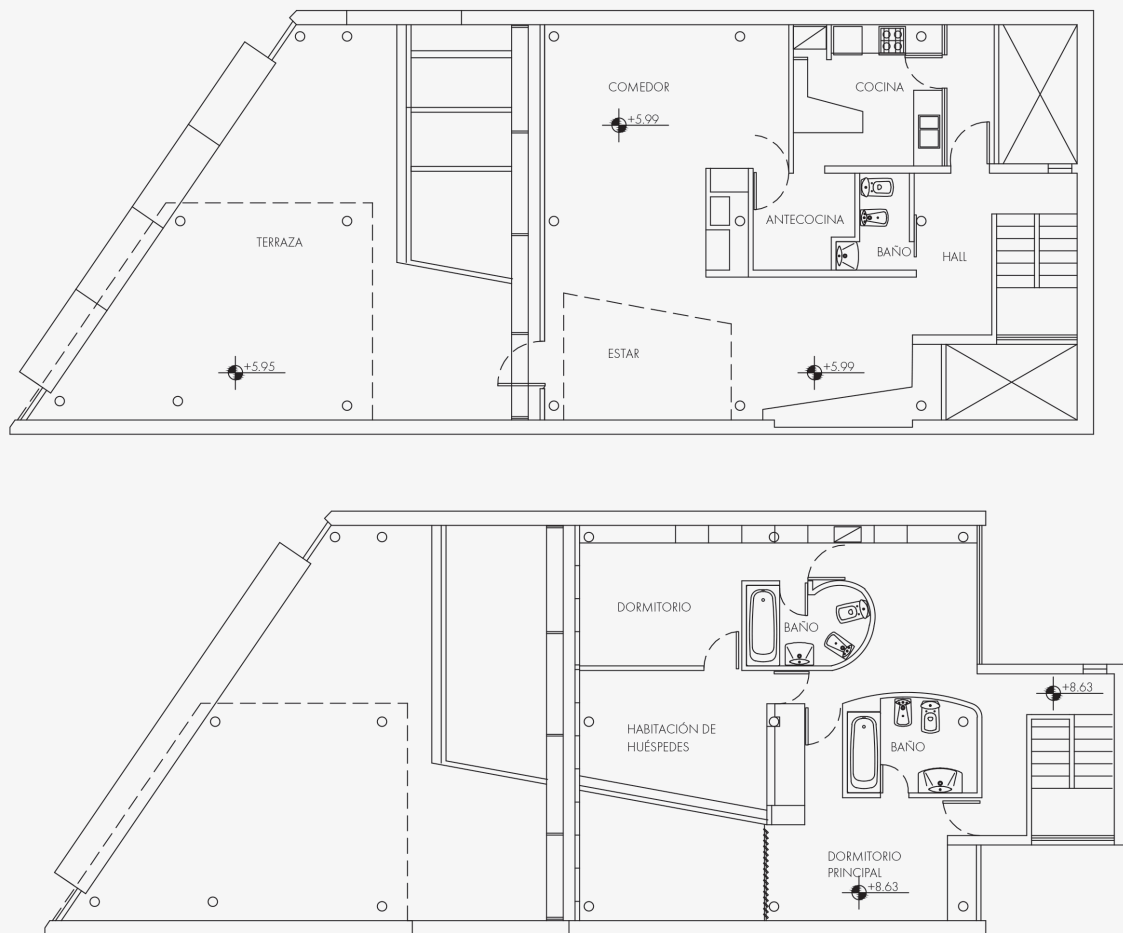
In 2013–2014, in order to ensure the continuity of CAPBA's administration of the house, value adding studies and actions were undertaken. These were jointly coordinated by CAPBA's Enhancement Research Institute, led by the architect Pablo Mastropasqua, and directed by the architect Julio Santana.

The building's value adding undertaken in this period can be labeled as deep maintenance. Any activity that required structural intervention was made but, due to the fact that the house is in very good condition from that aspect there was no element of the house whose stability was at risk.

All interior and exterior surfaces were treated. *Pilotis*, *brise-soleil*, walls, internal partitions, roofs, ceilings, floors, and joinery were repaired. Completion of those tasks required public access to be restricted to certain areas: the old garage, which now works as a reception area, and the services' areas at the lower level.

Surface treatment to walls, roofs and exterior floors consisted of a deep cleaning with mechanical means such as low pressure water, a chemical treatment to eliminate mildew from the surfaces, and being finished with total waterproofing.

Interior walls and ceilings innumerable small and medium size imperfections, produced by usage over several decades, were corrected. These included dents, damp, material degradation, removal of added external conduits for telephone and data supply and electric cabling. These irregularities were explored to check for deterioration or unseen corrosion in elements such as plumbing and metallic framework.



11 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949–1955. Plans, 1st and 2nd floors.

When sections of rusted plumbing were found, they were replaced with new ones. A similar criterion was taken with rusted metallic framework; they were uncovered and treated with paint as a protection and recoated with compatible materials. Once the imperfections in the substrate were fixed the surfaces were painted.

Regarding metal and timber joinery, they were sealed and waterproofed in order to avoid moisture infiltration and damp; they were completely painted as well.

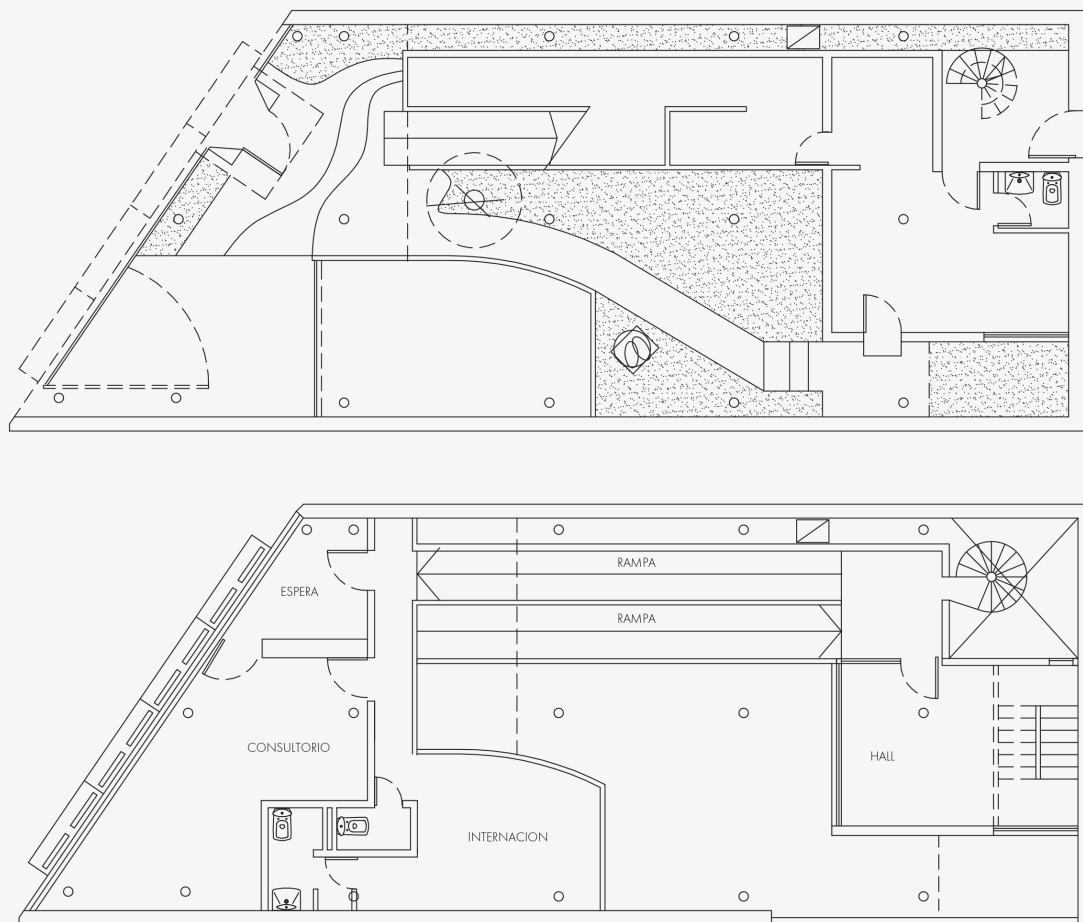
Besides the previously-mentioned intentions of the CAPBA, the collaboration and assessment of problems by SIKA Argentina SA, regarding the waterproofing, and Tersuave SA regarding paint, should be noted.

The enhancement process was done with the strict criteria of minimizing the impact on the house and using as a reference the original documentation. The documentation included that produced by Le Corbusier at his Parisian studio, Amancio Williams' documentation produced in Argentina, and the letters they wrote to each other and with Dr. Pedro Curutchet.

Academic Value

A third working aspect is currently being developed and will transpire in the next few months: the creation of a Corbusian Documentation Center where graphic and written elements, that marked the design process of the *Maison Curutchet*, can be kept and be accessible. Nowadays, most of this documentation is not available at the house because it is not in Argentina as it is at the *Fondation Le Corbusier* in Paris and at Harvard University in the United States. Another part of it is in the Williams File in Buenos Aires. A large number of articles, theses, texts and books, written by architects, artists and intellectuals from Argentina and all over the world, interpreting and investigating the house and the Corbusian universe, are already being systematically compiled and organized.

CAPBA, and the prestigious institutions mentioned, are already in contact and have offered their collaboration. Therefore it is expected that soon the *Maison Curutchet* shall be part of a reference documentation for all those investigators and academics who want to investigate it and Le



12 Le Corbusier, *Maison Curutchet*, La Plata, Argentina, 1949–1955. Plans, 0 and -1 floors.

Corbusier's activity in Argentina and South America. This Documentation Center will be located in the space where Doctor Curutchet had his medical surgery.

Corollary

Maison Curutchet is a small masterpiece located at the end of the world as viewed from Europe where the Master developed his works. Few could guess the enthusiasm with which the possibility of taking part, together with sixteen other Le Corbusier works located in seven countries on three continents, in the UNESCO World Heritage Sites serial Le Corbusier listing.

It has been sixty years since the day the *Maison Curutchet* was inhabited for the first time and fifty years since the day when Le Corbusier swam towards the sun for the last time. This is the year when the nomination is received by the World Heritage Committee to make possible that reality. ■

References

BOESIGER, Willy, GIRSBERGER, Hans, *Le Corbusier 1910–65*, Zurich, Les Editions d Architecture, 1967.

JOHNSON, Daniel Merro, *El Autor y el Intérprete*, Buenos Aires, 1:100 Ediciones, 2011.

LAPUNZINA, Alejandro, *Le Corbusier's Maison Curutchet*, Princeton, NJ. Princeton Architectural Press, 1997.

LIERNUR, Jorge Francisco, PSCHÉPIURCA, Pablo, *La Red Austral. Obras y Proyectos de Le Corbusier y sus Discípulos en Argentina (1924–1965)*, Buenos Aires, Prometeo Livros, 2009.

Jorge Néstor Bozzano

Architect from the Faculty of Architecture and Urbanism, University of Buenos Aires, 1975. Postgraduate in *Scuola de Perfezionamento in Restauro dei Monumenti* from the *Scuola Donna Regina*, University of Nápoles. Professor at the University of Buenos Aires and Universidad Católica de La Plata. Academic director of the *Centro Internacional para la Conservación del Patrimonio* (CICOP, Buenos Aires, Argentina), where he is involved in the master's program in Heritage Conservation.

Julio Santana

(b. La Plata, Argentina, 1962). Architect, graduated from the National University of La Plata (1989). He held various positions in the civil service at national, provincial and municipal levels, and was Professor at the College of Architects of the Province of Buenos Aires. Since 2011, Julio Santana is the Director of *Maison Curutchet* and is part of the Committee that supports the candidacy of the House to the World Heritage List of UNESCO.



Le Corbusier, *Villa Savoye*, Poissy, France, 1928. © FLC/SPA, 1984.

La Villa Savoye after Le Corbusier, une Longue Histoire

BY SUSANNA CACCIA GHERARDINI AND CARLO OLMO

This is a study of the microhistory of *Villa Savoye* that has already been realized, which thus does not concern its genesis (almost too studied by others). In the construction site of microhistory the reduced scale of observation is the space which may permit the reconstruction of interpersonal relationships as a historical subject and to experiment with new procedures and put interpretative categories to the test. The problem regarding the construction defects is more or less a constant in the work of Le Corbusier, in addition to the speed of the processes of both ageing and decay which are characteristic of the materials used in modern architecture. In this sense the restoration of the works of Le Corbusier is also an opportunity to bring back to the center of the critical and theoretical discussion crucial topics regarding the reflection on modern architecture: originality and authorship. Restorations such as the ones undertaken for *Villa Savoye* reopened the discussion on the topic of the restoration of an *auteur* architecture, beginning from its foundations.

Incipit

The correspondence between Mme Savoye and Le Corbusier regarding the “imperfections” begins the infinite season of reconfigurations/restorations of the *Villa*. The construction defects of the *Villa* began to be noticed in the years 1931–32. The problem regarding the construction defects is more or less a constant in the work of Le Corbusier, in addition to the speed of the processes of both ageing and decay which are characteristic of the materials used in modern architecture. In this sense the restoration of the works of Le Corbusier is also an opportunity to bring back to the center of the critical and theoretical discussion crucial topics regarding the reflection on modern architecture: originality and authorship. Restorations, such as the ones undertaken for *Villas Savoye*, *La Roche* or *Jeanneret*, reopened the discussion on the topic of the restoration of an *auteur* architecture, beginning from its foundations.

The challenge of values that *Villa Savoye* begins to present, precisely in those years, turns the attention to the process that transforms paintings, novels, or concrete architectures into icons, with the necessary reductionism this implies. This is a process that has not been studied enough, even in the case of Le Corbusier, in comparison to literature, for example, where the reception and critical fortune of the work are more widely explored. The fortune of these icons in manuals, not only of history of architecture, and in films and narratives regarding modernity, again not only concerning architecture, has contributed to determine the representation, but also the interpretation of these architectures, and for an entire period of restoration itself as well.

The debate has remote origins and there appears to be an increasing interest in the literature since the beginning of the 21st century, when all the topics regarding the restoration of a modern work, some at least twenty years

old, began to converge. A truly complex coalescence that includes debates regarding not only history but also its sources, as well as the *quasi*-obsessive relationship between history and restoration. After decades of dominance of the historiographical, critical and political interpretations, today restoration appears to entirely re-propose the debate regarding Le Corbusier's architecture¹.

The Years from 1955 (or 1947) to 1968

For Le Corbusier these are the years in which a shift in meaning from novelty to tradition takes place regarding *Villa Savoye* (a shift which prompted A. Tsiomis to say that *Villa Savoye* seems to have become Palladio's *Rotonda*, and Reichlin to call it a modern-day *Parthenon*). This is a process that was almost sanctioned by André Malraux on September 1st, 1965, in his funeral orations.

The reception begins its aesthetic transformation before 1959. In 1951, Pierre Sonrel had founded CEA (*Cercle d'Études Architecturales* — Architectural Studies Group), this is the same Sonrel who in 1947 published a little known book entitled *Les Fonctions de l'Habitation*, and who in 1955 hosted lectures by M. Besset and Ionel Schein in his “modernist” workshop at the *École des Beaux-Arts* (ENSBA). Besset and Schein, incidentally, would be a part of the commission appointed by the Ministry of Culture to choose the 100 architectural structures from the 20th century to be considered as Historic Monuments. The appointments were made by Max Querrien, the Director of the Architecture Directorate of the Ministry, who would initiate a debate amongst architects and art historians regarding the definition, and even the chronology of the modern age.

Yet why save *Villa Savoye*? Because it is an aesthetic testimony which reached its status as such through mediations: from Kidder Smith, who stated in 1993 that he told Giedion

in 1958 about the state to which *Villa Savoye* was reduced and about its imminent demolition; to the letters sent by Le Corbusier to Giedion and Malraux; the collecting of signatures, the articles, Malraux's concern for monuments that are emblematic of an era, to the recognition of *Villa Savoye* as a Historic Monument, the second after Perret's *Theatre des Champs-Élysées*. It was the critic and historian George E. Kidder Smith, well known for his books and media campaigns who, after a visit to Poissy, asked Sigfried Giedion to intervene². The following events, up to the recognition of the *Villa* first as a Historic Monument, in April 1962, and then as *bâtiment civil*, in February 1963, have been variously narrated, although the first complete reconstruction is by Kevin D. Murphy³.

The 1960s: Restoration or Reconfiguration?

On February 24, 1959, Mme Savoye informed Le Corbusier that the house and land have been transferred to the city of Poissy for close to one million francs. On the same day Le Corbusier sends a series of telegrams, to try to prevent the sale of the *Villa*. A proper lobbying campaign is initiated, which had actually already begun in an underground manner⁴.

It was in the late fifties that, upon the sale of *Villa Savoye* to the municipality of Poissy, that an "international preservation campaign" was directed towards safeguarding Le Corbusier's buildings.

The path that led Le Corbusier to begin "negotiations" with the minister of Cultural Affairs in order to obtain the protection of his own works "*au titre des monuments historiques*" (as Historic Monuments) is complex and not yet fully reconstructed. It is within this campaign that the emblematic case of *Villa Savoye* belongs. Interventions took place between the 50s and Le Corbusier's death in 1965, by people like Sert, Roth, Pevsner and Chastel, in publications, and initiatives that were set in motion, show an almost emblematic example of the passage from the recognition of an architecture by a relatively scientific community to public fame.

The crux of the matter was to complete a metamorphosis that had begun a good way back. Let us only think of texts such as that of Rowe, published in 1947 in the *The Architectural Review*, in which the passage on Poissy has the suggestiveness of Virgilian lyricism. Le Corbusier's villas were elevated to a classical status similar to that of the Roman era as interpreted by Palladio. The crux was, thus, to turn a work of modern architecture into a work of classical architecture, at the risk of alienating its meaning.

Another plot regarding this process had to do with the "stance of the images", to use the title of a book by Georges Didi-Hubermann⁵. Since the article in *Time Magazine* from 1959, which declared that "the machine for living became a machine for farming", the contrast is made between the images of the ruined *Villa* and those of the *Villa* when it was new, shown in black and white pictures of great expressive force. This is a process that would come to an end with the 1996 MoMA exhibition, with the paradigmatic title of *Destruction by Neglect*, curated by Arthur Drexler.

MoMA, which as early as 1932 had included the *Villa* in a section entitled *Modern Architects* of an exhibition curated by Henry-Russell Hitchcock and Philip Johnson, continued the dialectic narrative with the new exhibition, in which large blow-ups of the *Villa* in its initial stages are contrasted to those of the *Villa* in the heart-breaking condition it was in the mid-sixties, with the purpose of provoking a sense of outrage⁶. A strategy, initially almost entirely American, although the image of the ruined *Villa* was soon seen all over the world, in which the construction of a public opinion in favor of saving the *Villa* used the most suggestive tool available for creating the desired effect on a mass society.

When the *Villa* was recognized in 1963 as a Monument (*bâtiment civil*), the task was assigned to Jean Dubuisson, who had worked in Le Corbusier's studio, but who was also an employee of the *Service de Bâtiments Civils*⁷. Le Corbusier began to attend to the *Villa's* fate in April 1960, when he appealed to UNESCO, although the restoration was begun only in 1962 due to the fact that the *Villa* was being used as one of Minister Herzog's youth centers, the *Maison de Jeunes de Poissy*. This first restoration work was carried out by the Bertocchi company, under the direction of Fernand Gardien, who was a collaborator at the *Rue de Sèvres* studio, but it was interrupted almost immediately only to be resumed in May of 1964.

On April 2, 1960, Jean Petit visited Poissy and sketched the *Villa* as he found it, and then on the 15th of the same month Guillermo de la Fuente did a photographic survey of its state of decay. A sketch and a photo are thus used to interpret the decay of the building and to shock public opinion. From this point onwards Le Corbusier began a complex intellectual journey that, despite the wonderful studies by Josep Quetglas, has not been entirely deciphered. Initially Le Corbusier, together with Malraux, defended the longevity of his work and defined its condition as being impeccable⁸.

A little later, a resident of Poissy, Jean-Yves Le Guyader, took a series of interesting pictures which he then collected in an album and sent to André Malraux, to document the decay of the *Villa* and request the intervention of the Ministry to maintain at least the respectability of the area.

Two notebooks, R S66 and S67, contain initial traces and indications of the possibility of transforming the house into a museum. The house was not a conservative project. In the first place due to what Beatrix Colomina recognized, many years later, as the true alienating perception visitors have of the *Villa* as a bewildering residential layout. But even more disorienting was the project on which Le Corbusier worked with several variations⁹. That project anticipated the house's final destination, that of being the museum of itself, as well as the headquarters of the *Fondation Le Corbusier* and of CIAM, hosting a permanent exhibit on the work of the architect, and a more general museum on modern architecture. Yet before arriving at a consideration of it as a museum of itself, Le Corbusier made plans, which he did as an architect in relation to one of his works that he truly did not consider unalterable: the icon he himself had established in his texts and through his bitter requests for its protection.

01 Le Corbusier, *Villa Savoye*, Poissy, France, 1928. © FLC/SPA, 1984.



docomomo 53 - 2015/2

Essays



02 Le Corbusier, *Villa Savoye*, Poissy, France, 1928. © FLC/SPA, 1984.

The reconstruction of the entire process of the projects developed by Jean Dubuisson, those of François Gardien, the surveys entrusted by Le Corbusier himself to pupils of the *École des Beaux-Arts*, the relationship with the Bertocchi company, and finally the presentation of Dubuisson's project with annotations by Le Corbusier, are important in order to properly explore the analytic complexity of the said process¹⁰.

Clearly the complexity of these relations not only supports Bruno Reichlin and Tim Benton's theses on how to read Le Corbusier's projects, but also underlines the fact that it is in fact a "project", and not a question of preservation or restoration, as Le Corbusier himself often stressed in the period between 1961 and 1965¹¹.

The Seventies and the Transformation of the Horizon of Understanding

I will end this section with the counter-position to the canonical narrative regarding Le Corbusier in Besset's book, *Le Corbusier*, and the more artistic and heterodox version found in Stanislaus von Moos' *Elements of a Synthesis*, which are published in French and German, both in 1968, marking the opposite destinies of a historiography that was then quickly becoming very vast. Two books by Maurice Besset mark the beginning and the end of this part of the story regarding the first reception of the architect; one from 1958, *Le Corbusier*, which is a reflection on *Quand les Images Prennent Position*, and the other from 1968, *Et qui Était Le Corbusier*. The atmosphere changes after this, first of all in France, through Boudon's book on Pessac that signaled this passage: together with the persistence of Corbusian traces, it is now also the re-appropriation of dwelling, which is indebted to Henri Lefebvre, that marked the debate on modern architecture.

The reception thus became mostly the passage from the document (the files that are the archived memory), through the questions that the historians (from Carlo Olmo to Allen Brooks, from Gresleri to Tafuri, Dal Co, etc) asked of the document (Bloch said that the historian faces the archive armed with questions), in order to construct the documentary evidence to their hypotheses, still strongly influenced by a modernist ideology (except for William Curtis).

It is a passage from an operative history that legitimates to a history that asks questions, and it is with these questions that the new era begins.

Oblivion and Restoration in the Seventies and Eighties

The first serious rehabilitation of the house, undertaken by Jean Dubuisson, may be considered the beginning of a long path towards the transformation of the building into a museum. It was a rehabilitation planned over several interventions. The refurbishment undertaken in the sixties continued during the following decade, when a series of maintenance works were carried out by Yvan Gury, chief architect of the *bâtiments civils* and the national palaces.

Many partial restorations and repairs have been undertaken, such as those undertaken between 1983 and 1986, and

more especially the repainting of the house for the centenary of Le Corbusier's birth, in 1987. The works undertaken between 1985 and 1992 by J. L. Véret would involve mainly the structure, weather sealing and heating. These were interventions that would later be defined, in internal notes and reports, as works of "derestoration" and which generated debate regarding the various methods.

In particular, the report of October 13, 1983 makes evident the points of the debate regarding, on one hand, all of those interventions that were in "flagrant opposition to Le Corbusier's architecture" and, on the other, the selection of "exact paint tints". The disagreement extended to the definition of the finishes, in particular regarding the disagreement between the *Fondation Le Corbusier's* request to use a smooth coating, which was discarded mainly due to its high cost, and the choice of the *Direction du Patrimoine* to use a textured finish, which had the added advantage of "notably reducing the imperfections of parts of the masonry".

Worthy of note is the fact that the intended use for the *Villa* at that time already was that of "a place to visit and exhibition dedicated to Le Corbusier", considering the approaching centenary of his birth.

Notwithstanding the various restoration campaigns undertaken, the image of *Villa Savoye* in the mid-eighties was still that of an "abandoned monument, inaccessible and little frequented". Although not "in a bad state, the villa was never in impeccable condition [...] paradoxically seeming abandoned"¹².

The year 1990:

The Foundation's Notebook and Other Items

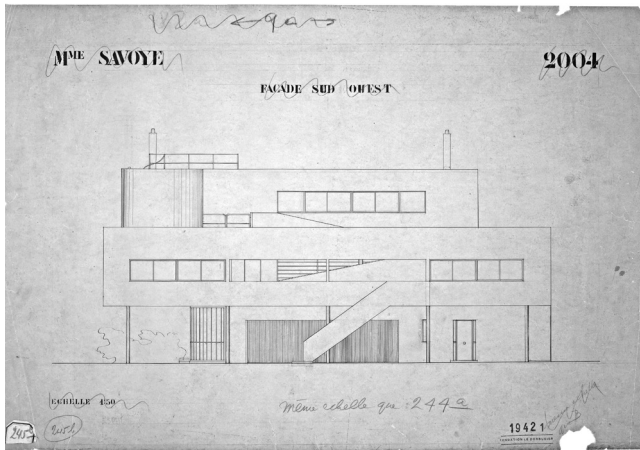
It is interesting to ponder how, in a history that has been going on now for over half a century, the first serious attempt at a systematization came only after the Le Corbusier's centenary year, 1987, with the monograph published by the Foundation on the subject of the *Conservation de l'Oeuvre Construite de Le Corbusier* (*Conservation of Le Corbusier's Constructed Work*) (1990).

The monograph considers questions regarding the changes in the usage of Le Corbusier's architectural works, as in the cases of *Villas La Roche* and *Jeanneret*, later incorporated into one unit and turned into a museum and headquarters of the *Fondation Le Corbusier*. One of the points open to debate is the supposed "legitimacy" of the transformation of the buildings by Le Corbusier, with the purpose of responding to new functional needs and current regulations.

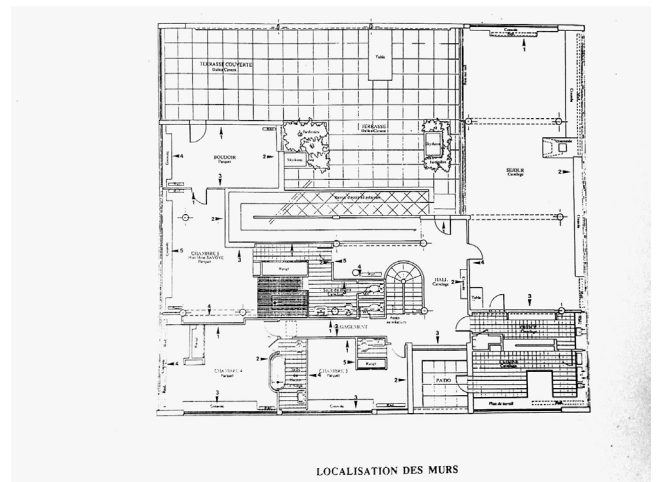
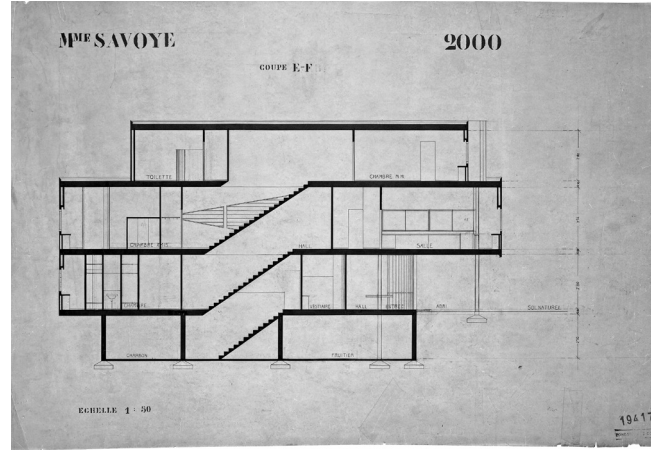
In 1987, the year of the centenary of Le Corbusier's birth, probably constituted the first opportunity to test, regarding modern architecture, the possible application of three tools used by the history of literary criticism and sociology of art: the horizon of awaiting, the transformation of the horizon of understanding, and architecture facing mediations.

The transformation of the horizon of understanding can almost be seen a year at a time. Before arriving to the exhibitions of 1987, the archives, the drawings, the texts, and especially the *Oeuvres Complètes* are one by one re-proposed (by the Garland Foundation, but also by some of the protagonists, from Wogensky to Maurice Besset).

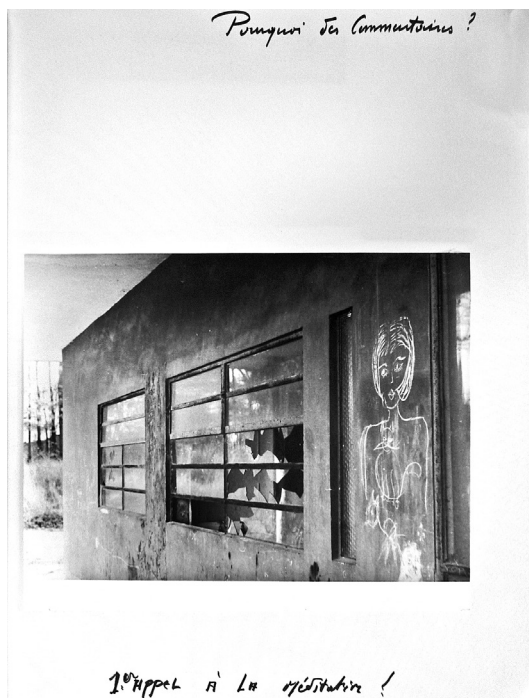
03 Le Corbusier, *Villa Savoye*, Poissy, France, 1928. Elevation Southwest. © FLC/SPA.



04 Le Corbusier, *Villa Savoye*, Poissy, France, 1928. Section © FLC/SPA.



05 Le Corbusier, *Villa Savoye*, Poissy, France, 1928. Implantation of the walls. © FLC/SPA.



06-07 Le Corbusier, *Villa Savoye*, Poissy, France, 1928. © FLC/SPA.



The document is first reaffirmed, together with the importance of philology (which marks a break with the “fable” style historiography of the seventies), to then consider the questions which arise from the archives. Ad in this latter case the scope of the questions clearly defined by Mary McLeod’s texts, as well as those of Tim Benton, which signal the passage from an ideological to a “political” critique, in the deepest sense, and from an analogical and metaphorical reading of the project to the reconstruction of patient research¹³, the reaching point of which will be an inter-textual approach. This would entail the gradual abandonment of the monographs on the *auteur*, which had been so popular in writings on Le Corbusier until 1987.

In 1987, as many as 26 exhibitions were planned, constructed and realized in France, as well as another 15 between Switzerland, Germany, Italy, the United States and Japan. As Nathalie Heinrich has pointed out, these exhibitions clearly indicate the role of critics and historians, as well as of the curators of exhibitions, museums and galleries, and through auctions, of collectors. Trying to cover all of them would entail a complete study on its own, so we will only consider the central exhibition to the celebrations, that held at the Centre Pompidou from October, 1987, to January, 1988.

The exhibition had a curator-creator (Jacques Lucan, together with Jean-Louis Cohen and other historians/critics that revolved around the archives of the Foundation), a curator-executor (Bruno Reichlin), an institution (perhaps created to tighten the links between modern art and greater public, the *Centre de Création Industrielle* (Industrial Design Center) at the Pompidou Center, and its director François Burkhardt). A complex net of mediators and mediations that would produce a catalog/encyclopedia, which truly had universal aspirations. The catalog contained interrogation of the documents, whilst the exhibition, centered on the mediations regarding the model (historical or *ad hoc*), represented the vehicle to reach the general public (an approach which would be maintained as the first project of the *Cité de l’Architecture et du Patrimoine*).

Yet the curatorial and editorial choices may be deconstructed and re-constructed to include periodizations, emergencies, keys for interpretation, and to find the links that unite texts such as those by Cohen, Reichlin, Benton, Taylor etc. and the staging of exhibitions such as Cohen’s *La Mystique de l’URSS* (*The Mystique of the USSR*) and *The Villas of Le Corbusier: 1920–1930*, by Tim Benton.

The next step is the reception in journals and magazines, not only specific to architecture, and how this reception constructs the figure of the implicit reader that reinterprets, disseminates and modifies the hermeneutic plans for the Centenary: from *Assemblage* to *Casabella*, from *L’Architecture d’Aujourd’hui* to *The Architectural Record*, a wide spectrum of reviews, still with a strong sense of structure and identity, which transform, read, disseminate and reinterpret the narrative, interpretative and expository choices of the exhibitions.

The exhibitions provide yet another critical and historiographical step: they divide the analysis into themes on

guidelines that are so strong that they will remain valid even beyond the year 2000. *L’Esprit Nouveau and the Machine*, *Modernity and Mediterranean identity* (which will produce offspring, both legitimate and illegitimate), *Les Objets à Réaction Poétique*, with all the literary rhetoric they carry with them, and finally all the exhibitions on the “origins”, which found their culmination in 2002 with Ruegg and von Moos’ work on *Le Corbusier before Le Corbusier*.

Restoration during the Nineties

The year of the publication of the *Fondation Le Corbusier* Notebook the situation regarding the *Villa* was documented in the *Étude: Conservation et Mise en Valeur de la Villa Savoye* (*Study: Conservation and Enhancement of the Villa Savoye*). This is essential material for understanding the building before the restoration work undertaken under J. L. Veret, and more specifically, in reading certain passages one understands that the state of the *Villa* was still appalling, and that some of the methodological choices executed in the past had actually accelerated the process of decay.

The *Étude* not only analyzed the then current situation, but also included a section regarding the restoration project of the *Villa* (worthy of mention is the fact that the term used is not “restoration”, but rather *remise en état* — or repair), in which the series of suggestions for the operations to be carried out defined the approach as an archaeological restitution of the original situation¹⁴.

It was, however, a restitution that kept in mind the *Villa*’s final transformation into a museum. A close examination was made of the possible strategies for the valorization of the building, and the solution to the questions related to the use of the building and the reception of visitors, such as the proposal to construct a new visitors center building.

In the early nineties the Foundation once again appealed to the Minister of Culture and Communication denouncing substandard condition of the *Villa*, and relating the many complaints the Foundation received from its visitors¹⁵.

A new restoration campaign was initiated in 1997 under Bruno Chauffert-Yvart, Architect of the Buildings of France, and assisted by Laurence Razy, finally determined the transformation of the *Villa* into a museum¹⁶. These works had been requested several times by the president of the Foundation, who, as early as 1987, had complained and appealed to the Minister, asking for a prompt intervention. In response to the continual requests, the entities in charge prepared a study which defined the guidelines to follow in the case of restoration.

Also in this case some conflicts arose, underscoring the fact that, especially when a work is of a certain importance, its transformation into a part of the cultural heritage generates dissent between different schools thought regarding restoration. The disagreements centered primarily on the decisions made on site which, according to president Christian Pattyn, brought “divergent views on certain important aspects regarding the protection of Le Corbusier’s image [...] upon which the Foundation was intervening on the basis of the coinciding opinions of Charlotte Perriand, Roger Aujame et Jean-Louis Vêret”¹⁷.



08 Le Corbusier, *Villa Savoye*, Poissy, France, 1928. Sounding. © FLC/SPA, 1997.

For the 1997 restoration works the colors of the *Villa* were determined through a series of soundings, as can be seen in the Report kept by the Foundation, which revealed under the various “layers the presence of former media on glue confirming the information deduced from people’s memories”.

The “original” colors identified were used as references for the various areas, except those for which no precise indications were found, and therefore deliberately left blank. This decision regarding the colors was the result of a long debate between the president of the Foundation at the time, and the Ministry, who had diverging opinions, in which Charlotte Perriand herself participated. The reopening of the *Villa* coincided with an exhibition, then considered as permanent, in which a series of panels illustrated to the visitor the history of the *Villa* up to its latest restoration.

The wealth of as yet unpublished material regarding the restoration work on the *Villa* since the sixties, provides evidence as to how the continuous restoration site that is *Villa Savoye* permits the historization of the various restoration trends that have been in vogue in France from the end of the fifties to the present. This may also stimulate research in which the restoration of the iconic work of an *auteur* helps to situate studies, investigation, surveys, on-site practices, dissent regarding values, and choices, within the wider debate about what cultural heritage has become in contemporary society.

Notes

In this essay the paragraphs: “Restoration or reconfiguration? The 60’s”, “Oblivion and Restoration in the Seventies and Eighties” and “Restoration during the Nineties”, were written by Susanna Caccia Gherardini. “The years from 1959 to 1968”, “The Seventies and the Transformation of the Horizon of understanding”, “The Year 1990. The Notebook of the Foundation and Other Items” were written by Carlo Olmo.

1 Susanna Caccia, *Le Corbusier dopo Le Corbusier. Retoriche e Pratiche nel Restauro dell’Opera Architettonica*, Milano, Franco Angeli, 2014.

2 Cfr. FLC H1-12-182

- 3 Kevin D. Murphy, “The Villa Savoye and the Modernist Historic Monument”, *Journal of the Society of Architectural Historians*, 3, 2002, p. 68–89.
- 4 Panayotis Tournikiotis, “Le Corbusier, Giedion and the Villa Savoye, from Consecration to Preservation”, *Future Anterior*, Vol. IV, No. 2, 2007; Josep Quetglas, *Le Corbusier y Pierre Jeanneret, 1928–1962*, Madrid, Rueda, 2004.
- 5 George Didi-Huberman, *Quand les Images Prennent Position. L’Œil de l’Histoire*, Paris, Editions de Minuit, 2009.
- 6 Mary Anne Staniszewski, *The Power of Display, A History of Exhibition Installations at the Museum of Modern Art*, Cambridge Mass. and London, The MIT Press, 1998, p. 74–75; 194–195.
- 7 J. M. Brás Rodrigues, A. S. Pereira da Silva, “Le Corbusier y la Restauración de la Villa Savoye / Le Corbusier and the Restoration of the Villa Savoye”, in *Criterios de Intervención en el Patrimonio Arquitectónico del Siglo XX*, Conferencia Internacional, Madrid, Ministerio de Cultura, 2011, p. 247–258; Kevin D. Murphy, “The Villa Savoye and the Modernist Historic Monument”, *Journal of the Society of Architectural Historians*, Vol. 61, No. 1, 2002, p. 68–89; Josep Quetglas, *Les Heures Claires. Proyecto y Arquitectura en la Villa Savoye de Le Corbusier y Pierre Jeanneret*, Sant Cugat del Vallès, Massilia, 2008, p. 127.
- 8 *Idem*, p. 324–325.
- 9 Beatrix Colomina, *Privacy and Publicity: Modern Architecture as Mass Media*, Cambridge (Mass.), MIT University Press, 1994.
- 10 This is what will be attempted in a forthcoming volume by both the authors published by Donzelli.
- 11 Tim Benton, *Villa Savoye and the Architect’s Practice*, in *Id., Le Corbusier: Villa Savoye and the Other Buildings and Projects, 1929–1930*, New York, London, Paris, Garland, 1984.
- 12 Felix Hanon, Gilles Ragot, *Conservation et Mise en Valeur de la Villa Savoye — Etude Réalisée pour le Ministère de la Culture et de la Communication — Direction du Patrimoine*, Paris, FLC, 1993.
- 13 Mary McLeod, “Architecture or Revolution: Taylorism, Technocracy and Social Change”, *Art Journal* 2, 1983, p. 132–147; Tim Benton, *Drawings and Clients: Le Corbusier’s Atelier Methodology in the 1920’s*, AA Files, 3, 1983, p. 42–50.
- 14 Felix Hanon, Gilles Ragot, *idem*.
- 15 Letter the 17 of December 1991, in *Villa Savoye Restauration*, Archives vivantes, FLC.
- 16 “Patrimoine. La Villa Savoye Restaurée”, *Le Moniteur*, 4881, 1997, p. 45; Bruno Chauffert-Yvart, Arthur Rüegg, “Die Sanierung der Villa Savoye”, *Bauwelt*, 42, 1997, p. 2380–2385; “On Color Restoration of the Villa Savoye”, *A + U: Architecture and Urbanism*, 3, 2000, p. 198–201.
- 17 Christian Pattyn to François Barre, the 26 of June 1998, in *Villa Savoye Restauration*, Archives Vivantes, FLC.

Susanna Caccia Gherardini

(b. 1972, Italy). PhD in Technology and Management of Cultural Heritage, Associate Professor in Restoration, DIDA University of Florence and Adjunct Professor at Faculty of Architecture, Xi’an Jiaotong University. She published more than 70 publications; among the most recent, *Restoration in a Few Words* (Huazhong, HUST Press, 2013), and *Le Corbusier dopo Le Corbusier. Retoriche e Pratiche nel Restauro dell’Opera Architettonica* (Milano, Franco Angeli, 2014). She is writing the book *Villa Savoye, 1929–1998* with Carlo Olmo that will be published in 2015 by Donzelli.

Carlo Olmo

(b. 1944, Italy). Masters in History (1969) and in Philosophy (1970), Full Professor in History of Architecture (1989–), Dean of the Department of Humanities (1994–2000), of the Department of Architecture (1995–1999) and Dean of Faculty of Architecture (1999–2008), Politecnico di Torino. Visiting professor in MIT in Boston, Barcelona and London. He was *Direttore d’Etudes* at EHSS, Paris (1984–1989), founded and directs the *Il Giornale dell’Architettura* (2002–) and was the city architect and the director of Urban Center in Turin (2003–2014). He published *Architettura, Edilizia, Ipotesi per una Storia* (Roma, 1974); *Le Corbusier e l’Esprit Nouveau* (with Roberto Gabetti, Torino, 1976); *La Città Industriale* (Torino, 1980); *Alle Radici dell’Architettura Contemporanea* (with Roberto Gabetti, Torino, 1989); *Le Esposizioni Universali, 1851–1900* (with Linda Aimone, 1990, 2013); *Urbanistica e Società Civile* (Torino, 1992); *La Città e le sue Storie* (with Bernard Lepetit, Torino 1995); *Dizionario dell’Architettura del XX Secolo* (Torino, 1999, Roma, 2003); *Architettura e Novecento* (Roma, 2011); *Architettura e Storia* (Roma, 2013).



Le Corbusier, Scraping in the black lines, to attenuate the color value, *Entrée, Villa E-1027, Roquebrune-Cap-Martin, France* © Marie-Odile Hubert, 2011.

The Restoration of the Paintings of Le Corbusier in the Villa E-1027, Roquebrune-Cap-Martin, Alpes Maritimes

BY MARIE-ODILE HUBERT

The restoration of the paintings of Le Corbusier in the Villa E-1027 was preceded by an important study phase including systematic sampling of the paintings. One purpose of the study was to determine the presence of the original paintings under the global over-paint made by a local craftsman in the seventies. Four of the eight paintings have been rediscovered, in a much better condition than expected. These paintings are a fragile testimony of the particular use of "Ripolin" by Le Corbusier, in the context of its use by others famous artists as Picasso or Picabia in the same period.

Introduction

The restoration of the paintings of Le Corbusier in the Villa E-1027 is part of a vast project, launched around 2000, for the conservation of the entire "Site Le Corbusier" in Roquebrune-Cap-Martin. The site includes the Villa E-1027, Le Cabanon (the cabin) and Le Corbusier's studio, *l'Étoile de Mer* and the *Unités de Camping* (holiday chalets), owned by the Rebutato family.

We have taken an interdisciplinary approach to the project, seeking to guarantee long-term conservation of the paintings in the building, respecting their historical and technical integrity and their association with the structure. To achieve our objectives, regular meetings were held to better define the issues surrounding the conservation of the villa and the paintings, bringing together the Fondation Le Corbusier; the *Conservatoire du Littoral*, owner of the site; the Pierre-Antoine Gatier Agency, *Architecte en Chef des Monuments Historiques* and *Inspecteur Général des Monuments Historiques* (ACMH-IGMH), project manager; the municipality of Roquebrune-Cap-Martin, site manager; the *Conservateur Régional des Monuments Historiques* (DRAC-PACA), as well as other expert organizations, including the *Centre Interdisciplinaire de Conservation et Restauration du Patrimoine* (CICRP) for technical support through laboratory analysis.

We received a commission for an initial study prior to the restoration of the Le Corbusier paintings in 2007, with the purpose of better understanding the techniques and the material history, and establishing the protocol for the conservation and restoration work to be carried out.

The study was conducted with technical support from the CICRP, for analysis of pigments, binding agents and the stratigraphy of the paintings¹.

Restoration was undertaken in 2010-2011.

The study phase involved obtaining the necessary information for a thorough knowledge of the construction of the building and the origins of the decorative elements, as well as their physical history. Then the state of the paintings

was evaluated, the nature and causes of observed alterations determined, and specifications defined for the future restoration. In this case, it was difficult to evaluate just what part of the paintings was the original work of Le Corbusier. Indeed, the murals were painted over at the end of the 1970s after Le Corbusier's death. In order to carry out the conservation and restoration of the work, this problem had to be solved.

Architectural Context and Creation of the villa

Jean Badovici² purchased a plot of land along the old customs officer's path and the railway in 1926, on the site known locally as *Le Massolin*.

From 1926 to 1929, Eileen Gray, an Irish designer, drew the plans for the villa and had it built. She also designed all of its furnishings. Eileen Gray used her own palette of colors for the villa, and stencilled the walls with words indicating the use of spaces or how to move through them, such as a sign at the entrance. Some of the stencils can be seen in photographs published in *l'Architecture Vivante*.

The article published in *l'Architecture Vivante* in 1929, "E-1027, *Maison en Bord de Mer*", describes the building of the house. It is thanks to this article that we have information on the original state of the villa.

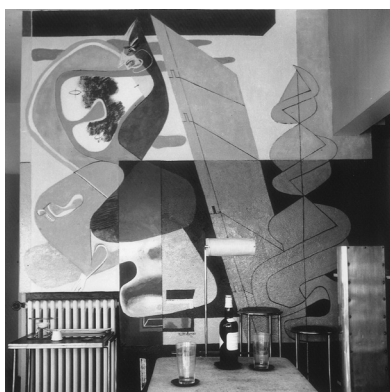
Most of the photographs in the review are in black and white, but some have been colorized, proof of the importance of color and the aesthetic qualities of Eileen Gray's architectural design. The photographs were very useful in our work, because they enabled us to better understand the layers present in the walls painted by Le Corbusier.

The Origins of the Paintings

During the thirties, many of Jean Badovici's friends visited the house, in particular Le Corbusier, a close acquaintance at the time.

The paintings in Villa E-1027 are the second cycle of murals by Le Corbusier. His first "experiment" was in

01-02 Le Corbusier, Painting *Coin Salle à Manger*, Villa E-1027, Roquebrune-Cap-Martin, France. © FLC/SPA, Lucien Hervé.



Jean Badovici's house in Vézelay; he had seen the work of Fernand Léger, painted by Raoul Simon³, on the wall in the courtyard of that house.

At the villa, Le Corbusier painted the murals in different phases, during several visits. These different phases are made apparent, for example, on the large painting *Coin Salle à Manger* (dining nook), where he noted the dates: 39, 49, and 62, using different types of paint each year.

Study of historical sources reveals more precise information on their creation and history.

At the end of April 1938, Le Corbusier spent several days at the Villa E-1027 with his wife Yvonne. He painted two murals there: *La Toilette Complete*, and the *Sgraffito* on the foundation wall plus the *galet* (pebble) on the adjacent wall. He wrote to his mother on May 5th: "At Bado's, 5 days in his lovely house, working on two wall paintings that look good and have really helped me progress (...) I think something great is ahead".

He continued during the summer of 39, when he made six more paintings, and not ten, which was the number of paintings he thought he might paint for the villa, as he indicated in a letter to Jean Badovici dated August 3rd, 1939: "I have a mad desire to splatter the walls: ten compositions are ready, enough to smear over everything..."⁴.

Material Past

In August 1949, Le Corbusier returned to Cap-Martin to work on the plans for Bogota with his collaborators. He took the opportunity to "touch up" (*sic*) the villa's murals, some of which had been damaged.

03 Le Corbusier, Villa E-1027, Roquebrune-Cap-Martin, France. General view after treatment, *Coin Salle à Manger*. © Marie-Odile Hubert, 2011.



At the end of the year, he also asked Lucien Hervé, the photographer he began working with in 1948, to photograph his paintings, in particular those in Cap-Martin. These photos have provided precious help in visualising the intermediary state prior to Le Corbusier's last intervention in 1962. During the fifties, Le Corbusier became friends with Thomas Rebutato, the owner of the restaurant perched above the Villa E-1027, acquired the little piece of land next to it, and started building his cabin (*Le Cabanon*).

He also painted on the walls there:

- In 1950, he painted the outer wall of *l'Étoile de Mer*, and on September 6th and 7th, 1952, with his characteristic speed, he painted a room in *l'Étoile de Mer*.
- Between 1952 and 1956, he painted the entrance to his cabin and the inner surface of the shutters.

In 1962, after the death of Jean Badovici, Le Corbusier worked on the paintings again at the request of the new owner.

Finally, after the death of Le Corbusier in 1965, an ultimate "restoration" was undertaken by Jean Broniarski, a decorator, in 1977-78. The paintings were almost completely redone at that time⁵, and the originals disappeared beneath brighter, flashier colors. Broniarski also made a copy of the large *Sgraffito* on the ground, painting on the casing wall that had been placed over the original. He made variations on his copy, using light-colored lines instead of the black lines of the original. He signed two of his restorations, on the wall of the *Entrée* (entrance) and the reconstituted *Sgraffito*.

Although the villa was listed as part of the regional heritage by the *Monuments Historiques* in 1975, it was abandoned

after the death of its last tenant, left empty for several years and occupied by squatters. On September 29th 2000, the site was listed as a national heritage monument.

Systematic Sampling of the Paintings, Stratigraphic Studies

One of the most important issues of the initial study was to evaluate the degree of conservation of the original paintings underneath the newer layers. Before the study, no one could be certain of the state of the original work.

The series of systematic and stratigraphic samples taken during the study provided answers: some of the original paintings were clearly present and apparently in better condition than one might have feared.

Of the eight original paintings, four have been conserved: *l'Entrée*, the *Coin Salle à Manger* and *la Toilette Complète* as well as the *chambre d'amis* (guest room) on the ground floor. However, the outdoor painting to the right of the entrance has completely vanished, the outside painting next to the *Chambre d'Amis* is very patchy, the original *Sgraffito* has disappeared and the *galet* was totally painted over, with no trace of the original remaining.

Between fifteen and twenty samples were taken from the paintings to determine whether or not the original layer was underlying. Given the thinness of the overpainted layer and mechanical fragility of the original painting, chemical tests (solubilisation of the "Broniarski" layer using solvents of increasing polarity) were chosen over mechanical stripping. This made it possible to obtain very satisfactory results in terms of preservation of the surface aspect of the original layers of the pictures. The samples have been documented and plotted for each painting in order to give a precise image of the original colors.

Study of old photographs (in black and white and later in color), provided a source of comparison with the original painting layers revealed in the samples as well as specifics on the different stages of the paintings' material history, in particular Le Corbusier's last touches and the intervention of Jean Broniarski.

Observations and Diagnosis

The second issue for the initial study was to establish the state of the paintings, look for the causes of alterations observed and establish a diagnosis in order to suggest appropriate protocols for conservation and restoration.

Problems of water seepage, leaks and rising damp were identified and quantified during the preliminary study, in regard to the structure and especially the walls where Le Corbusier had painted, so the work necessary for effective restoration could be specified.

The examination of concrete, hollow bricks and cement used in construction, and the decay of these materials suggested the presence of soluble salts in the white wash underneath the paintings. These salts (sulphates, nitrates or chlorides), with the process of crystallisation and changing shapes in relation to the degree of humidity, are one of the causes of damage to the paintings, leading to blisters and lacunae.

The various alterations were revealed and plotted, and showed:

- Structural alterations (cracks, salts, gaps in the whitewash);
- Alterations on the painted layer (gaps, blisters);
- Exterior alterations (impacts, scratches, wear and tear, dirt, graffiti and vandalism dating from the period when the house was abandoned).

Restoration of Paintings

When the research was complete, the protection of the paintings during repair work on the building was planned.

Temporary protection

While waiting for the scientific committee to make a decision on the elimination of all painting applied after the death of Le Corbusier and because of the sensitivity of certain colors to solvents or water (both original and overpainted colors), a temporary protection was devised using a *Cyclododécane*® base. The advantage of this material is its total sublimation at ambient conditions. It disappears more slowly in a closed space, and sublimation means that no solvent is needed for rinsing and no mechanical action on the surface is required. It leaves no residue.

This process leaves the painted-over surface intact and does not make it less soluble, as would be the case with acrylic adhesives that are often used for laying down protective paper.

Extraction of Salts

It is not surprising, given the materials used in masonry and the presence of humidity in different forms (seepage, rising damp, condensation, mist), that soluble salts were found in the walls and in the whitewash. Changes in the crystalline shapes led to changes in volume and movements that resulted in the separation of affected materials.

The extraction method that was chosen involved compresses (*Arbocel*® cellulose pulp) applied to the areas in question.

In this case, the nature of the painted layer kept humidity from penetrating into the wall; it only seeped into the cracks, creating the risk that the paint would peel off the wall.

The compresses were thus used in the patchy areas. The amount of salts extracted (chlorides, nitrates and sulphates) was evaluated using test strips at regular intervals, and through the measurement of ion concentration and the conductivity of compress samples, tests carried out by the CICRP.

The consolidation of zones where the whitewash was peeling and the painted layer was separating
Blisters in the painted layer were mostly caused by the underlying wall coating. This whitewash had to be consolidated so that the flakes of paint could adhere to the wall.

Criteria for the choice of consolidation and adhesive agents in this type of intervention are mainly: physico-chemical stability of the materials used, and thus their durability; their compatibility with the original materials; the homogenous distribution in powdered coatings.

The range of acrylics in solution and dispersion meets these criteria. Acrylic emulsions and micro emulsions were used together, at low concentration.

Stripping the over-painting

Stripping of the over-painted layer could begin when the fragile areas had been stabilised.

This operation consisted of eliminating the surface painted by Jean Broniarski in 1978.

Initial tests carried out during the study (solubility tests at increasing polarity) indicated the solubility parameters for the later painting to be stripped as well as the level of sensitivity of the original painting to these solvents, with regard to their characteristics.

Then we developed different solvent gels that met these criteria, in order to optimise the efficiency of the solvent on the surface while limiting its spread to the deeper layers; the effect was faster on the thickest over-painted layers. The gels were rinsed off carefully, to eliminate all residues on the layer of the original paintings.

Filling in the patchy areas of the undercoat

The materials were chosen with regard to their compatibility with the original.

They were used in proportions that ensured a greater porosity than that of the original white wash, and lower mechanical resistance. These materials thus play an important role in protecting the original surfaces: in the case of seepage, water is drawn away to these areas first.

We created a lime-paste putty loaded with micronized calcium carbonate and a very small dose of micro-acrylic as an organic binding agent.

Regeneration of some layers of paint where the binding agent had worn thin.

The paintings that were most exposed to the sun (*Coin Salle à Manger*) or to weather conditions (*l'Entrée*) were affected, in certain color zones, by a deterioration of the binding agent, leading to increased dullness of the surface and an undesirable desaturation of the colors. This effect is not very significant on enamel paints such as Ripolin, which are made to resist extreme conditions, but is apparent on certain traditional oil paints. *Regalrez*® resin in low concentration was applied to the affected areas. This enables a slight re-saturation of the colors without any modification of the surface appearance. This resin was chosen for its reversibility and good stability over time.

Reintegration of lacunae

The problems related to treating lacunae in the four paintings are determined by different factors. Indeed, depending on the size, the location, and the existence or absence of old photographs, choices concerning the application of color to missing patches differ. Any such operation must be free of interpretive intent that would be detrimental to the historic or aesthetic reality of the work. These two conditions, history and aesthetics, are sometimes divergent principles that interact to determine the extent of

reintegration. In each case, both considerations must be weighed and balanced when deciding how the work will be presented.

Micro-lacunae and small, clear-cut lacunae that are perceived as interruptions are easy to recover, with no risk of error in interpretation. They are filled in with a technique that is close to illusionism, structured by fine cross-hatching according to surrounding strokes; thus the reintegrated area can be identified at close range, but from a normal viewing distance visual continuity is maintained.

Larger lacunae give rise to problems of interpretation.

In some instances, old photographs make it possible to reconstruct the shapes with a degree of precision that is satisfactory on the whole.

The level of reintegration is lower in these cases, the hues are slightly paler than those of the surrounding painted areas and the aspect of the surrounding material has not been imitated in detail, so they are distinct from the original.

However, when signatures were missing, and no sufficiently precise photographs were available, they were not reintegrated. The surrounding lacunae were treated in the color of the background layers.

Le Corbusier's Technique Rediscovered

Eileen Gray's palette revealed

One of the particularities of the Villa E-1027 paintings is that they covered the decorative paintings of Eileen Gray. Sometimes these elements can be discerned in Le Corbusier's compositions.

Our hypothesis is that he integrated some parts of Eileen Gray's work into his own.

This is especially evident in the stencils "*sens interdit*" and "*entrez lentement*", which were left on the wall and integrated into the *Entrée*.

The stratigraphies carried out by CICRP micro-sampling sometimes confirmed the hypothesis that Eileen Gray's polychromes were the base coat for Le Corbusier's paintings.

The clearest example is the *coin salle à manger*, where the dark blue background on the lower section corresponds exactly to the dark zone visible in the photographs published in *l'Architecture Vivante*. This ultramarine pigment mixed with carbon black also matches the original polychrome revealed after the restoration of the *épine paravent*.

The "Le Corbusier" layers

Several letters and some orders to suppliers give indications of paint used:

A first letter from Le Corbusier to Raoul Simon dated August 16th 1948 mentions the use of two types of paint: "The murals at Cap Martin and the last one I did on *Rue de Sèvres* (16 m² on Isorel preparation) were based on Ripolin mixed with tubes of paint, diluted with petrol. The result is firm, resistant; what is nice is that the various colors of Ripolin are close to the real color and Ripolin seems like a very durable medium".

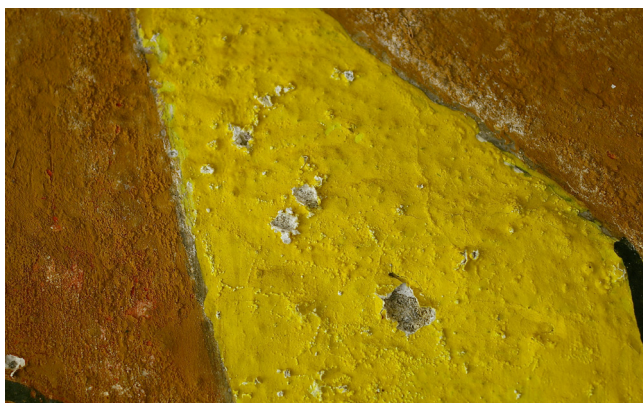
These paints were used by many artists, including Fernand Léger (murals in Vézelay) and Pablo Picasso.



04 Le Corbusier, Detail of the dates, *Coin Salle à Manger*, Villa E-1027, Roquebrune-Cap-Martin, France. © Marie-Odile Hubert, 2011.



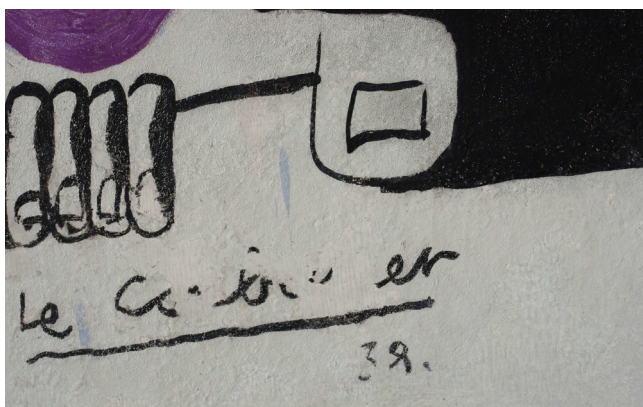
05 Le Corbusier, Liftings in the paint layer, *La Toilette Complète*, Villa E-1027, Roquebrune-Cap-Martin, France. © Marie-Odile Hubert, 2006.



06 Le Corbusier, Salt efflorescences, *Coin Salle à Manger*, Villa E-1027, Roquebrune-Cap-Martin, France. © Marie-Odile Hubert, 2006.



07 Le Corbusier, Removal of over-painting, before and after. Villa E-1027, Roquebrune-Cap-Martin, France. © Marie-Odile Hubert, 2011.



08 Le Corbusier, Signature, *La Toilette Complète*, not reintegrated. Villa E-1027, Roquebrune-Cap-Martin, France © Marie-Odile Hub



09 Le Corbusier, Detail of a drip mark and crazing, *Coin Salle à Manger*, Villa E-1027, Roquebrune-Cap-Martin, France. © Marie-Odile Hubert, 2011.



10 Le Corbusier, Scraping in the black lines, to attenuate the color value, *Entrée*, Villa E-1027, Roquebrune-Cap-Martin, France. © Marie-Odile Hubert, 2011.



10 Le Corbusier, General view after treatment, *Chambre d'Amis*. Villa E-1027, Roquebrune-Cap-Martin, France. © Marie-Odile Hubert, 2011.



12 Le Corbusier, General view after treatment, *Entrée*. Villa E-1027, Roquebrune-Cap-Martin, France. © Marie-Odile Hubert, 2011.



13 Le Corbusier, General view after treatment, *La Toilette Complète*. Villa E-1027, Roquebrune-Cap-Martin, France. © Marie-Odile Hubert, 2011.

The use of Ripolin is well suited to Le Corbusier's style of painting, fast and spontaneous. The quick drying time of layers enables overlays and their fluidity lends transparency. The glossy result makes surface variations possible.

In addition, a letter from Le Corbusier to his supplier Blanchet, dated 27th August 1949, mentions paints in tubes that may have been used to “touch up” the paintings:

“Dear Monsieur Blanchet, would you be so kind as to send by return mail
1 tube dark cobalt violet
1 tube light cobalt violet
To Chez Robert ‘Étoile de Mer’ Cap-Martin-Roquebrune (AM)”
(FLC E1 8 31T)

These violet colors may have been used to change the light blue on the violet edging around the Dante figure in *La Toilette Complète*, for example.

Once the paint-over was removed, the characteristic shine of “enamel” paints reappeared and the traces of application with a brush or a finger were visible anew. The contrasts between the matte, satin and very shiny surfaces are controlled and determined, as in other murals or canvases (*peinture de l'atelier de la rue de Sèvres, Vézelay 1939* for example).

The transparency of the layers allows the dark or light layers underneath to show through in the final work.

Characteristic craquelures are once again visible in areas painted with Ripolin.

Some older modifications became visible, such as the signature on the *Entrée*, moved from the centre of the composition to the left edge. The spot where Eileen Gray's desk stood is apparent again, as on the preparatory sketches for the *Chambre d'Amis*.

The 1962 layers have a satin to matte finish and bubbles typical of paint with water content (emulsion or dispersion), similar in appearance to the painting on the *Cabanon*.

The whites have various nuances, cold white or yellowish white for the 1962 painting. These “mismatched” touches, where dirty white was applied over a purer tone, are typical of the painter's spontaneity.

Laboratory analyses (undertaken by the CICRP) made it possible to achieve greater precision with regard to Le Corbusier's palette for several hues, based on the micro-samples.

In the range of pigments we found:

- Carbon black or bone black;
- Lead, zinc, bryum sulphate, lithopone and titanium whites;
- For reds, oranges and yellows: chromium yellow, barium yellow, cadmium yellow, vermilion (or minium), red ochre and PR₃, an organic coloring agent, for the 1962 painting;
- For greens: a blend of Prussian blue and chromium yellow, an unidentified organic green, a chromium oxide green;
- For blues: ultramarine and phtalocyanine (for the 1962 painting);
- Cobalt violet.

Analyses of the binding agents revealed the presence of an oil-based product in the different layers sampled. Oil is often found as a binding agent in tubes of paint but also in Ripolin and enamel paints made through the 1930s and up until 1945 for some products. After the war, alkyd resins were widely introduced in the composition of quick-drying enamel paints. The colors found on the Villa E-1027 paintings that meet these criteria are:

- Pale yellow, white, light and medium blue for the *Coin Salle à Manger*;
- White and violet for the *Toilette Complète*;
- White background, light blue, medium blue, gray, green, violet for the *Chambre d'Amis*;
- White, violet, light blue, sienna, light ochre for the *entrée*.

The restoration of the paintings, with the elimination of the top layer that was painted over, revealed the technique of Le Corbusier the painter, and established more specific information on the cycle of paintings in the Eileen Gray Villa, which integrated her polychromes in the final works.

Conclusion

The Villa E-1027 is an especially fragile icon, witness to the genius and the opposition of some of the 20th century's great artists.

The traces of three protagonists on a single site — Eileen Gray, Jean Badovici and Le Corbusier — raise questions about their links and influences within a historical hermeneutic.

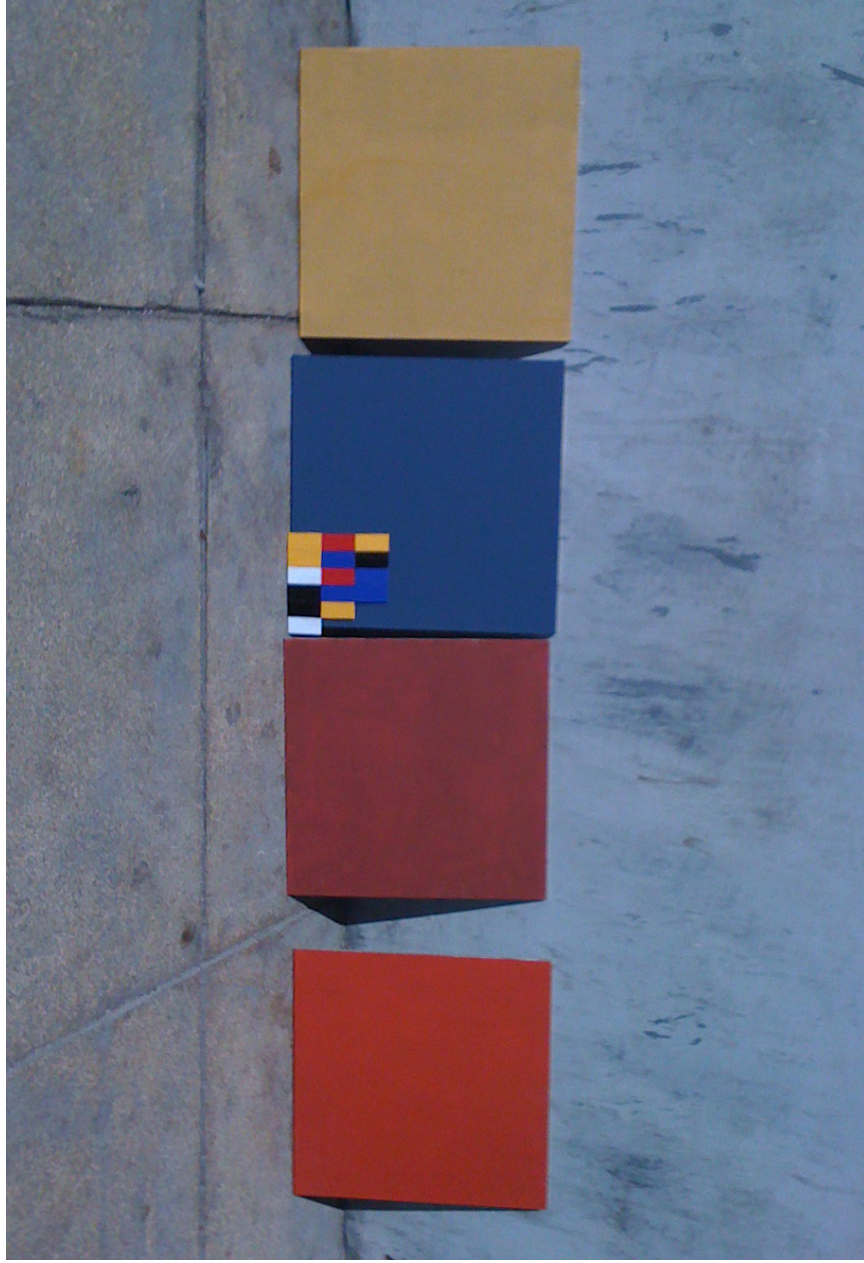
The changes that took place here over time are well worth our attention and should be viewed with a humble eye. For this reason, the various partners chose the greatest level of conservation for the original material present. The 21st century will be tasked with the preservation of the site. ■

Notes

- 1 Cicrp, *Étude pour la Conservation de la Villa E-1027 d'Eileen Gray. I. Étude des Peintures Murales de Le Corbusier*, June 2007.
- 2 Editor in chief of *Architecture Vivante*, close to Christian Zervos, Eileen Gray, and Le Corbusier as of the nineteen-twenties.
- 3 Today it is in the Zervos Museum, in Vézelay.
- 4 *Fondation Le Corbusier*, E1-5 34 T.
- 5 Florence Cremer obtained this information during a telephone interview with Jean Broniarski.

Marie-Odile Hubert

(1977, France). Conservation of modern and contemporary art for institutions, museums and historic monuments (*Musée National d'Art Moderne, Château de Versailles, Centre de Recherche et de Restauration des Musées de France, Fondation Le Corbusier, Fondation Dubuffet...*). Degree from *Inp-Département des Restaurateurs du Patrimoine*. Dedicated to the study and the restoration of Le Corbusier's paintings: restoration of the mural at 35 Rue de Sèvres (2005); preliminary study for the restoration of Le Corbusier's painting in the Villa E-1027 (2007); emergency action on the painting outside the *Étoile de Mer* (2009); study of polychromes in the *Cabanon*, the studio and the *Unités de Camping* and the paintings in the *Cabanon* and the *Étoile de Mer* (2009); conservation and restoration of the Villa E-1027 paintings (2010–2011). In 2003, was graduated with first class honours as Painting Conservator, *Institut National du Patrimoine-Département des Restaurateurs du Patrimoine*, Paris. In 2013 received a Fellowship with *Centre National des Arts Plastiques*, for the Study on Enamel Paints from the first Half of the 20th Century in French Heritage.



Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. Presentation in the CSAS meeting of color samples for the south façade, based on the Salvation Army flag colors. © Gilles Ragot, July 2013.

Renovation and Restructuring the *Cité de Refuge* by Le Corbusier & Pierre Jeanneret Preserving the Dual Functional and Architectural Identity of the Masterpiece

BY GILLES RAGOT

The *Cité de Refuge*, for the Salvation Army, was built in Paris by Le Corbusier and Pierre Jeanneret, in 1933. For Le Corbusier, it represented a formal, technical and mainly social architectural manifesto, as part of his idea of new society published in La *Ville Radieuse*, in 1935. Seventy years after, the building is deeply transformed because the everyday use is inadequate for the contemporary community standards for the reception of homeless and current climate standards. The challenge of the last restoration campaign (2007–2015) was to reconcile the current demanding standards while maintaining and upgrading the architectural qualities of the building.

The *Cité de Refuge* for the Salvation Army (an international Evangelic charitable organization), located at the intersection of *Rue Chevaleret* and *Rue Cantagrel* in Paris, built in 1933 by Le Corbusier and Pierre Jeanneret, has kept its original function: to shelter homeless people and help their social reintegration. Since then the building has undergone major transformations, three restoration campaigns, and suffered from lack of maintenance due to the Salvation Army's scarce resources. The organization had been eager to start major renovation works, when it joined the social housing developer 3F in 2008, which provided its financial resources and experience in project management, in return for a long-term lease.

The project management was entrusted to two architects experienced in social housing, François Gruson and François Chatillon, the latter was also Historic Monuments architect in chief. The design process was highly complex: to restore the building and its extension, built in 1975 — the *Centre Espoir* by Philippe Verrey and Georges Candilis; to adapt the building to the new missions of the Salvation Army; to optimize the functioning of the building; to adapt to fire safety standards and accessibility standards; to rationalize the way of functioning; and to be part of the *City of Paris Climate Plan*. All these goals needed to be accomplished whilst respecting the heritage value of the *Cité de Refuge*, partially protected by statutory listing since 1975. The studies began in 2009, despite the tension between *Fondation Le Corbusier* and the Historical Monuments Services, which was particularly intense due to the low consideration given to this type of heritage. Gradually a consultation process was set up within an Archaeological and Scientific Monitoring Committee (CSAS) bringing together all social and economic stakeholders. The search for a balance between social constraints and heritage issues resulted in

the restoration of the original qualities to a larger extent than the protected parts. Paradoxically, in spite of the new renovation-rearrangement modifications, the building is recovering authenticity but in a state that has never existed.

The *Ville Radieuse* Healing Machine

The *Cité de Refuge* takes its real dimension in the context of the *Radiant City* publication (1935), a functionalist city model, whose principles are stated in the *Charter of Athens* (1933–1943). In the publication, a messianic project was designed that summarized the Modern Movement Utopia: the response to society's ills solely by virtue of a new architecture and a reforming urban planning. For Le Corbusier, the *Cité de Refuge* was not simply social housing, but a healing machine that should provide “proof” of the superiority of modernity over academicism.

The building responds to the three Salvationists tasks: accommodation, meal distribution and social regeneration. The building resembles to an ocean liner aground in the heart of Paris. Behind a 1,000 m² glass curtain wall, the architects accommodated 500 beds in dormitories and small rooms as well as a nursery. In front of the glass prism, the sequence of the porch volumes, the gateway, the glass block rotunda and the lobby, solemnize the passage from the hostile city to the healing machine. Below *Rue Cantagrel*, the *Rue Chevaleret* secondary entrance opens to an interior street which gives access to the gardens, a meeting room and the liner machinery: kitchens, workshops, etc.

Le Corbusier envisage a hermetically closed controlled climate environment behind “a neutralizing wall”—Le Corbusier's terminology for the forerunner combined system comprising air conditioning and a sealed double glass wall where the panes were separated by an insulating air layer. However, behind the south glass wall, reduced to a single



01 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. South Façade Glass Curtain Wall in 1933. © I2-4-41-001 FLC/SPA.



02 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. South Façade Glass Curtain Wall in 1933. Interior Street in 1933, the renovation in 2008–2015 restored its original state. © I2-4-60-001 FLC/SPA.

pane due to budget restrictions, the poorly designed air conditioning system failed to prevent the inevitable greenhouse effect what made the building uninhabitable during the summer. After two years of stubborn resistance, facing the obvious malfunction that questioned the expected “proof”, Le Corbusier had to conform to opening a few windows to provide natural ventilation to the overheated building.

Despite the ambition that drove this experimental work, there were a number of faults: summer overheating, noisy ventilation and heating systems, fragile equipment and bursting glass blocks. The situation worsened on 25 August 1944, the day of Paris’ liberation, when a German bomb blasted almost all the glass still in place. Due to the lack of resources, timber boards and a provisional hollow brick wall, which were built behind the glass-curtain metal frame, replaced the glazing.

Half Century of Alterations and Partial Renovations

During the second half of the 20th century, the *Cité de Refuge* had three restoration campaigns in the periods 1948–1953, 1973–1977 and 1986–1991. None was either based on a consistent methodology or accurate historical and material knowledge of the work³. They profoundly altered the original materiality and blurred the intelligibility and overall coherence.

Le Corbusier and Pierre Jeanneret were in charge of the first work campaign that definitely altered the building’s image. As the Salvation Army rejected the idea to rebuild the glass curtain wall, Le Corbusier designed a conventional façade protected by a *brise-soleil*. This renunciation shows an inflection of his messianic positions as well as his inclination to explore a brutalist aesthetic that completely reversed the building’s original purist image. The intervention also covered the replacement of some metal window frames by wooden windows, gutters repair, water drain-

age, lobby repaving, replacement of glass bricks and the abandonment of the glass curtain wall facing *Rue Chevaleret* in favor of a façade divided into spandrels, sliding windows and hopper windows.

Behind the *brise-soleil*, the design and construction of Le Corbusier’s polychrome façade leaves scarce material traces to record, reducing, even today, its interpretation to hypothesis. The architect abandoned the purist palette of the interwar period in favor of the Salvation Army flag colours: dark red, dark blue and yellow ochre. In March 1952, Le Corbusier imagined a color scheme close to the Dutch principles of geometric abstraction. Though, some time later and before he went to India, he gave up the first color layout due to economical reasons in favor of a monochrome ochre facade. On his return, the yellow was painted but the color did not correspond the one he had chosen⁴. Inside, the pillars and doors were in painted faux wood and marble, and the glazing in faux stained glass⁵. Le Corbusier felt betrayed to the point of breaking off relations with the Salvation Army.

Nevertheless, in June 1960, he advised the new director of the institution who wished to restore the hall to its original colors. The work was carried out to the satisfaction of the director who in 1961, asked the architect for advice to color the *Rue Cantagrel* façade. In any case, the first color stratigraphy proved that the color scheme in white, gray, blue, yellow and red, dates from this period.

It seems that no major maintenance work was then undertaken from 1953 to 1970. In response to the concerns about a new restoration campaign, assigned to Ph. Verrey, the facades and roofing of the entrance hall, as well as the stairs linking the hall to the interior street, were protected by statutory listing on the 15 January 1975. The building’s condition was devastating; the work of this second campaign concerned in particular the restoration of parts altered during the war, the replacement of French style win-



03 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. South façade in the early 1970s with a *brise-soleil* installed in 1952. The volumes of the two upper floors were to be restored in the construction works of 1973–1977. © L2-4-43-001 FLC/SPA.



04 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. South façade before the last restoration work. On the left-hand side the slice of the original 1933 glass facade and the balconies redone at an unknown date, though after the death of Le Corbusier. © Gilles Ragot, 2012.

dow frames, the cleaning of the *Rue Cantagrel* façade colors, rebuilding the glass block walls, replacement of many chassis, and changing terraces railings. The volumes and the general appearance of the upper part of the building were reinstated. The 1952 brutalist façade was already the subject of changes: some fixed parts were replaced by casement windows and the faded polychrome painting had to be redone. In the absence of meaningful archival traces, and any serious study or survey, the 1975 colorful face lift lacked legitimacy and authenticity, but it lasted as the building's image. The most important change, however, concerned the façade color (facing *Rue Chevaleret*), which had never been previously painted any color other than white. At the same time, Ph. Verrey and G. Candilis were in charge of the *Centre Espoir* extension, designed without pastiche in a Corbusian spirit and with polychrome painting consistent with that of the *Cité de Refuge*, a source of misperceptions to uninformed visitors.

Less than ten years later, the third reconstruction phase, performed by Ljubomir Nikolic from the ARENA practice, consisting of an upgrade due to new regulations, substantially affected many aspects and the materiality of the building. The construction work focused on: the replacement of the timber structure to *Rue Chevaleret* with aluminum structure; the substitution of *Rue Cantagrel*'s timber casement windows with aluminum sliding windows over a light timber spandrel; the painting of the *brise-soleil*, and the reconstruction of the entrance gateway. Only when the works had been finished, did the *Fondation Le Corbusier* realize what had happened.

Routine maintenance and sporadic renovations took place one after the other from 1992 to 2001: including the reception desk alteration; stairwell closure; fire doors installation. In 2001, the Salvation Army launched a new upgrading program comprising *Cité de Refuge* and *Centre Espoir* with the purpose of improving the residents' living

conditions. A team of architects with little experience in the field of modern heritage renovation was hired⁶. The proposed scheme didn't accomplished the best conservation practices, which the *Fondation Le Corbusier* strongly deplored. Finally, the project was aborted, not because of the criticism, but because the Salvation Army could not afford the expense alone. For this reason the Salvation Army joined the 3F group.

Towards the Application of Good Practice

During the 2009 competition for prime contractor selection, Chatillon Gruson noted the "understandable" concern of the Salvation Army "not to see the 'social action depleted by the' heritage protection action"⁷. The winning architects assumed this concern as a priority. Nevertheless, the social project underlies the Heritage project for which there is no funding. As the *Cité de Refuge* retained its original function it was possible to direct social housing subsidies to the renovation of the heritage-protected areas, and even further.

Firstly, the project management refused to divide the *Cité de Refuge* and the *Centre Espoir* into "minor spaces that can be sacrificed to comply with regulation and renowned major spaces which should not be touched, only conserved"⁸. Due to the number of regulation constraints — environment, fire safety, disabled access — they shifted from a comprehensive approach in favor of sacrificing the *Centre Espoir* in order to preserve the *Cité de Refuge*.

The architects refused a doctrinal approach. Their reasoning was based on a hierarchy of priorities, the first being to know for whom the restoration-reconstruction is directed towards. In the first place, comfort, respect and dignity for the inhabitants as well as the provision of good working conditions, guided all the decisions. Secondly, the hierarchy of priorities varied according to the situation in order to highlight materiality, the visual aspect and the spirit of the masterpiece. Gruson and Châtillon were prudent about the



05 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. Dormitory before the last restoration work. © Gilles Ragot, January 2012.



06 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. Presentation of samples of glass tiles, during a CSAS meeting. The tiles were made according to a 3D scan of the 1933 pavement. © Gilles Ragot, January 2012.

terms “reference state” and authenticity, especially because it is a building that had been profoundly changed, including by its original architects. However, two reference states appeared to be legitimate: the building configuration after completion in 1933, and at the end of the first renovation, which was entrusted to Le Corbusier and Pierre Jeanneret. These two reference states have slightly different designs and are overlapped in a complex way, namely at the south façade facing *Rue Cantagrel*. That façade had been substantially rebuilt in 1952 but there still remained there a slice of the 1933 glazed façade and the balconies that had been redone at an unknown date. The architects practical reconstruction approach thus combined: invention in order to meet the new standards of care, particularly for accommodation; restoration to the original form of the parts from 1933 or 1952, including parts that were thought to have been destroyed and that were rediscovered during the construction work; and interpretation when archives and surveys did not provide a clear answer to a question, as in the research for the exact nature of the polychrome facade of 1952. This pragmatic approach resulted in the creation of a state that had never existed, not an ideal state under Viollet-le-Duc’s sense of the term, but a state resulting from the desire to reconcile the restoration of heritage values with social issues, regulations and the client’s budget.

The last reconstruction phase was based on the full knowledge of Le Corbusier’s archives, the Salvation Army archives, and public archives, which had been explored during the preliminary study (2009–2010). However, it had lacked a thorough analytical survey of the three previous renovation works and countless modifications or alterations introduced over time due to maintenance and user requirements. The absence of this survey was one of the reasons for the mistrust in the relations between the project stakeholders and the sponsors in the period 2009–2011. These relationships evolved when, at the request of the City of Paris⁹

and on the recommendation of the *Direction Régionale des Affaires Culturelles* (DRAC) (Regional Directorate of Cultural Affairs), the *Commission du Vieux Paris* (the Commission of Old Paris) and the *Fondation Le Corbusier*, 3F set up the CSAS. Its purpose was to provide room for debate among a group of experts on heritage conservation and on the work of Le Corbusier to mediate the different options for conservation and restoration of the building. Even the architects in charge of the project admitted the CSAS was instrumental in the establishment of good practices of restoration and renovation. The CSAS moderation was entrusted to Vanessa Fernandez, consulting architect, already co-author in 2010 of research, which was complementary to the preliminary study, on the climate aspects of *Cité de Refuge*¹⁰.

In order to maintain the residents’ accommodation during the construction work, the work was organized in two phases, the first starting with the renovation of the *Centre Espoir* in December 2011. This phasing, as well as the delay caused by the discovery of asbestos in the two buildings, extended the time for reflection on the *Cité de Refuge* and for a real dialogue within the CSAS. In 2014, a “route” sub-committee was created, long before the opening scheduled for late 2015, to consider another category of user — the public visitors — in full respect for the dignity and anonymity of residents. Thus the *Cité de Refuge* renovation is not the result of an established doctrine or the setting up of a project based on a systematic prior analysis of archival sources and building, but the result of a constant adaptation to the actual construction site conditions and of finding solutions to the problems that the archaeological findings posed.

Create • Renovate • Interpret • Restore

In recent years, the two buildings have been grouped under a single name: Center for Accommodation and Social Reintegration (CHRS) of the *Cité de Refuge* — *Centre Espoir*. Thus the contractor legitimately considered the two buildings as



07 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. The building is cleared, behind the *brise-soleil*. © Gilles Ragot, January 2015.



08 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. The construction work on the 7th and 8th floors permitted a return to the original interior and exterior volume of the director's apartment. © Gilles Ragot, January 2015.

09 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. To restore the profiles of metal frames of the 7th floor, as closely as possible to the original, a solution of invisible interior vertical stiffeners was adopted. © Gilles Ragot, January 2015.



10 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. Installation of timber window frames painted in yellow. © Gilles Ragot, January 2015.



a single entity. During the design process, Gruson and Châtillon concluded that the social and legal constraints were incompatible with the safeguarding and restoration of the *Cité de Refuge* heritage values, so they chose to preserve the work of Le Corbusier and Pierre Jeanneret, protected as a historical monument and with worldwide historical recognition, to the detriment of the building designed by Candilis and Verrey¹¹. This decision, contrary to the original strategy advocated after the 2009 consultation, helped to free *Cité de Refuge* from the environmental Climate Plan constraints and as well as the constraints related to disabled access¹². This solution fully assumed by F. Gruson, who was responsible for this part of the CHRS, led to a significant change to the internal organisation and facades of the *Centre Espoir*, despite tense discussions with the Architect of the Buildings of France and criticism from the *Commission du Vieux Paris*, and some architectural periodicals¹³.

The desire to restore a functional coherence to the whole CHRS resulted in the redistribution of functions and in the

improvement of the passage from one building to the other by creating a new staircase volume, facing *Rue Chevaleret*, to link the corners of both buildings. The two entities are now, functionally speaking, a single unit, though from a heritage and architectural point of view, the gap is widening between the two main buildings of the CHRS.

The design of single bedrooms provided with bathrooms in the *Cité de Refuge* is the most invasive and destructive action undertaken in the original spaces, including the demolition of some original parts. The reconstruction work permitted the clearing out of the building, providing views similar to those of the construction site of the thirties, where bare slabs and concrete frames evoked the potential contained in the concept of the “free plan”. The rehabilitation of the *Cité de Refuge* accommodation benefited from this potential once again in the redesign of the bedrooms that provide each resident with the comfort and dignity they are entitled. In response to the constraints relayed by the CSAS — to conserve the corridors and original distribution of doors and to



11 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. The staircases are opened to provide the original spatial fluidity. © Gilles Ragot, 2015.



12 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. The staircase leading from the lobby to the large meeting room on the ground floor, protected by listing as a historical monument in 1975, was restored to its original form in February 2015. © Gilles Ragot, 2015.

13 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. Unblocking the stair opening between the entrance hall and the ground floor below. © Gilles Ragot, 2015.



14 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. Unblocking the stair opening between the entrance hall and the ground floor below. © Gilles Ragot, 2015.

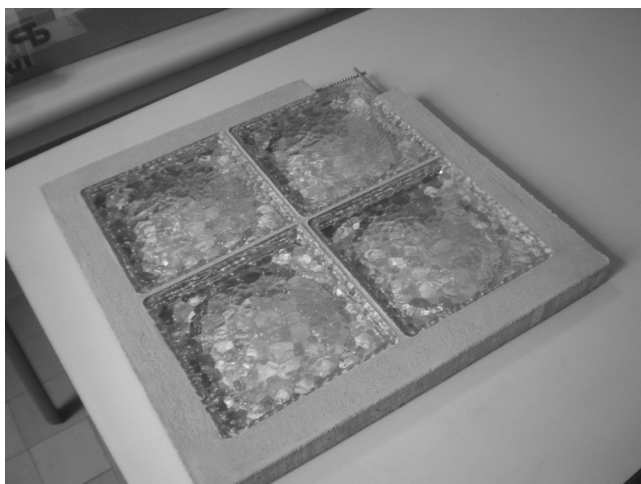


maintain the concordance between the partition walls and the south facade of 1952 — a deviated partitions solution is adopted to fix the partitions to the façade components.

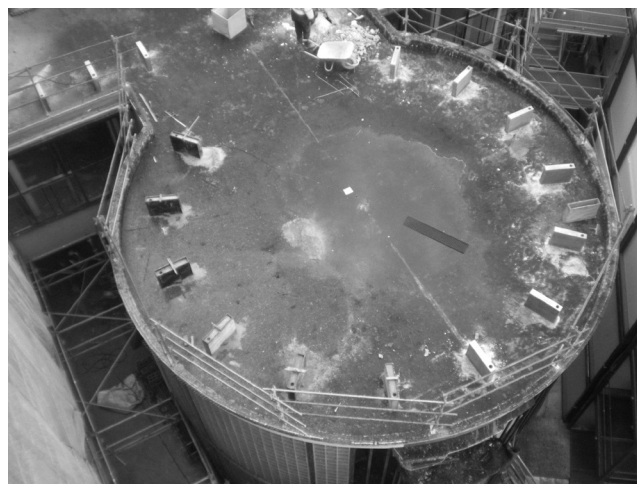
These components are entirely remade in timber — the material adopted in 1952 by Le Corbusier and Pierre Jeanneret — according to the original design whilst incorporating double glazing. Renovation and interpretation are combined to maintain the proportions of the frames and restore a polychromy, about which there was no certainty, except that there was no documentation or investigation that justified the 1975 color scheme. In addition, not a single original painted item of the 1952 facade remained in 2008. Chatillon assumed the responsibility of proposing a color palette inspired by the Salvation Army flag colors that Le Corbusier wanted to use. However he explored a third way consisting of an interpretation of the tones of the flag, with the purpose of harmonizing them with the raw entrance porch colors and adapting them to the perception that we would have in the brise-soleil shadow¹⁴.

Outside and inside, the restitution of protected parts was important. A study conducted by V. Fernandez and Bénédicte Gandini, a consulting architect from the *Fondation Le Corbusier*, helped to reproduce the polychrome Desagn glass tiles which gave bright and vibrant colors to the porch; rebuilt an identical replica of the access gateway; systematically replaced the non-original and non-complying rotunda glass with reproductions obtained from 3D scans of the original pavement; repainted the original colors in the hall and stairs, on which there were recent archival and stratigraphic studies; cleared the skylights and demolished the staircase walls leading to the lower ground floor level, thus giving back the fluidity of space in accordance with the spatial qualities of 1933.

On the first floor above the lobby, the reading room area, unprotected in 1975, regained its original appearance as well as the patios, which had been gradually filled in by subsequent additions. Other unprotected sectors can also be found in a condition close to their initial configuration state,



15 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. Presentation of samples of glass tiles, during a CSAS meeting. The tiles were made according to a 3D scan of the 1933 pavement. © Gilles Ragot, 2012.



16 Le Corbusier and Pierre Jeanneret, *Cité de Refuge*, Paris, France, 1933. The rotunda roof will not be open to the public in order to avoid the installation of railings that were originally not there. However planters are rebuilt identically. © Gilles Ragot.

especially the “interior street” of the lower ground floor where the construction works uncovered the old kitchen walls with their original metal window frames behind the layers introduced in recent decades. Deformed by successive transformations but also by the use as a garbage room, the interior street praised by all architects and historians as a modern highlight of the interwar period, recovered a high level of authenticity, by pushing away the obstructing containers which are now stored in the *Centre Espoir*.

Compliance with fire safety regulations was one of the toughest battles between the architects and the CSAS. The enclosure of exits, the installation of fire doors or smoke curtains in the halls, stairs, or in front of the reading room, would have destroyed the desired spatial fluidity created by Le Corbusier and Pierre Jeanneret, which Theo van Doesburg and Jean Badovici labeled “space/time” and that Le Corbusier renamed simply “architectural promenade”. A precise study of the smoke extraction and the commitments made by the CHRS manager on the use of certain public areas, helped avoid invasive solutions that were contrary to the preservation of its architectural properties. Finally, many details of heritage value to the building could be saved by defining, with the client and the authorities, all those elements that could escape the requirements of the ten-year guarantee, considering a fair assessment of the risks involved.

The restoration-restructuring of *Cité de Refuge* was not the application of a doctrine but a negotiation between all the involved stakeholders. To change the original assignment of this building, which is known around the world for its architectural values, in order to faithfully reproduce its 1933 state, or that of 1952, would have been a nonsense and contrary to its primary significance: to be a “machine to heal”. The purpose of preserving the original function meant reaching a compromise, which does not mean an absence of convictions, but the ability to sustain strong ideas in a responsible, civil and democratic debate. ■

Notes

- Essay translated from the French by Joana Gouveia Alves.
- 1 François Gruson Opéra practice was the architect in chief of the entire operation.
- 2 The Plan Climat is a program whose purpose is to promote energy efficiency in new and renovated buildings and was adopted by the Paris Council in October 2007.
- 3 Nevertheless since 1981 there is an excellent monograph by Brian Brace Taylor, *Le Corbusier. La Cité de Refuge. Paris 1929/1933*, L'Equerre, collection «Repères», Paris 1981.
- 4 Le Corbusier's letter to Irène Peyron from the 31st July 1952, FLC J2-10-25.
- 5 *Idem*.
- 6 Pierre Iranmher and Béatrice Laroque architectural practice.
- 7 F Gruson et F Châtillon, *Proposition d'Étude. Note d'intention*, manuscript, 03/03/2009, p. 4.
- 8 *Idem*.
- 9 The creation of the CSAS Committee was a requirement of the building permit requirement, in July 2010.
- 10 Vanessa Fernandez, Emmanuelle Gallo, *La Cité de Refuge de l'Armée du salut à Paris — Le Corbusier. Rapport sur les Problématiques Climatiques de la Cité de Refuge; Parois Vitrées et Systèmes de Chauffage & Ventilation*, Study commissioned by François Châtillon, architect in chief of historical monuments and Opéra/François Gruson, arch., Paris, December 2010.
- 11 For a period of time the idea of demolishing the *Centre Espoir* was on the table, but soon it was abandoned since a new consultation process would have been required.
- 12 This solution restricts equitable access to the ground floor areas.
- 13 See the minutes of the plenary session of the *Commission du Vieux Paris* 16/12/2010, p. 2–9; the article by Jeanne-Marie Dumont, “For the Cité de Refuge”. *Archiscopie*, No. 123, June-September, 2013, p.23–24; and that of Hubert Lempereur, “La réhabilitation préoccupante de la cité de refuge et du centre espoir”, *AMC*, No. 221, February 12, 2013, p. 18-19.
- 14 The intermediary solution was approved by the CSAS, against the opposition of the *Fondation Le Corbusier* that preferred a restoration according to the principles of 1952 based on recent research. See the CSAS meeting minutes 12/12/2013, p. 2.

Gilles Ragot

(b. Louviers, France, 1957). Curator of 20th Century Archives for the *Institut Français d'Architecture* (1984–1994). Professor at the *Ecole Nationale Supérieure d'Architecture et du Paysage in Bordeaux* (1994–2013). Since 2013, Gilles Ragot is a professor of History of Contemporary Art at the *Bordeaux Montaigne University*.



The Couvent de La Tourette from 1960 to the Present Day. Future Discernibility of Past Interventions

BY ROBERTA GRIGNOLO

The *La Tourette* Convent, built by Le Corbusier in Eveux (1953–1960) was subjected to interventions very soon after its inauguration. The article presents a critical analysis of these interventions: those overseen by Fernand Gardien (until 1964) right after completion; those undertaken before the complex was listed and for which limited documentation is available (1964–1979); the restoration campaign led by the *Architecte en Chef des Monuments Historiques* (ACMH) Mortamet, who followed an approach based on the completion of Le Corbusier's work; lastly the most recent campaign, overseen by the ACMH Repellin, who succeeded in devising intelligent alternative compliance measures thanks to the fire safety officials. The complex was returned to its original appearance, following an approach that has yet to come to terms with the aging of modern architectural works, but is nevertheless still widely used today in the conservation of 20th century architecture.

The *Couvent de Sainte-Marie de La Tourette* was designed and built by Le Corbusier as a place of learning for the Dominican order in Eveux-sur-l'Arbresle, not far from Lyon, between 1953 and 1960. Since its completion, it has undergone several interventions and adaptations — notably to accommodate visitors after 1970 — including a recent restoration campaign started in 2006 and completed in 2013, which brought the building to the attention of the *Fondation Le Corbusier* (henceforth FLC). As often happens, not all of the interventions were registered nor comprehensively documented. Thus the complex — like many other 20th century buildings — raises the issue of discernibility of interventions. For instance, some of the *ragréages* (concrete patches) date back to the original site work, but many interventions on the concrete surfaces followed, including recent patching. Will the former be recognisable from the latter in ten or twenty years' time? Similar questions can be asked for the interventions on the renowned *pans ondulatoires* ("undulating" glazing) or on the *canons à lumière* ("light cannons" — splayed conical skylights). Such open issues put forward by the FLC called for a thorough documentation not only of the recent restoration work, but also of previous interventions, which could be traced only by cross-referencing several different archival sources¹. This article is the outcome of work developed with students from the *Accademia di architettura in Mendrisio*² at the request of the FLC. The result, a graphic and critical documentation recording of the changes that have taken place over the years, is a contribution to the, as yet, underexplored history of 20th century heritage conservation.

“*Loger cent coeurs et cent corps dans le silence*”

The article focuses on restoration interventions, but a few historical notes seem necessary to highlight the building's main features.

Le Corbusier received the commission in 1952 thanks to the Dominican Father Marie-Alain Couturier (1897–1954), an artist by education and a pioneer of the renaissance of sacred art and architecture. The program “*Loger cent coeurs et cent corps dans le silence*” (“Providing silence abode to a hundred bodies and a hundred souls”),³ which entailed building not only a liturgical space, but also living quarters for the monks, allowed Le Corbusier to further develop his research on dwelling units and on the “interplay of individual and collective life”⁴. The monks' cells — a hundred rooms for teachers and students — became the unit of measure and composition of the entire project.

In the post-war period, the number of ongoing projects at the *Atelier* prompted Le Corbusier to assign the direction of each to a different collaborator. In the case of *La Tourette* it was Iannis Xenakis (1922–2001), a knowledgeable young Greek engineer and *avant-garde* musician who had arrived in Paris as a refugee, who was asked to lead the project. This collaboration was marked by such highly prolific exchanges that it is difficult to recognise with confidence the paternity of some of the adopted solutions.

The complex was built on sloping terrain and was designed, as Le Corbusier stated, “*[en prenant] l'assiette en haut, à l'horizontale du bâtiment au sommet*”⁵ (i.e. from the top down): the U-shaped living and study building has a reinforced concrete frame, it is raised on piers of various



01 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953–1960. Aerial view from the North shortly after completion. © FLC/SPA.



02 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953–1960. The cracks on the *acrotères* (parapets) are already visible before the completion of the worksite. © FLC/SPA, ACT, late 1950s.

forms and thus leaves the slope intact. The church closes the composition: it is an isolated box-shaped volume in *béton banché* (off-form poured concrete), which rests directly on the ground. The rectangular space between the buildings is left in its natural sloping condition, so there is no habitable courtyard, but a “garden-court” instead. Yet all the buildings are connected at the lower level by walkways called *conduits*, which form a cross-like plan. An assemblage of prismatic forms punctuates the flat-topped ensemble: the oratory with its pyramidal roof, the cylinder of the spiral staircase, the ear-shaped crypt with its *canons à lumière* and the triangular section atrium (Figure 01).

As for the façades, the living and study building is crowned by two levels of cells with deep loggias, which mark the residential quarters. Towards the inside of the court, the corridors which lead to the cells are clad in concrete blocks — except for a continuous horizontal eye-level opening — and covered in a rough, white-painted plaster. Below are located the communal activities, such as the classrooms, the library and the refectory, which are recognisable for their glazed envelopes, articulated according to interior light requirements. The façades along the perimeter of the court consist of story-high squarish concrete panels, prefabricated in-situ. Slender posts and horizontal elements subdivide each panel in quadrangular compartments, which are alternately glazed or clad in concrete. Such elements — which can be read as a mineral transcription of the timber *pan de verre aménagé* of the Maisons Jaoul — are called *pans en Z et en H*, according to the position of the opaque parts.

Conversely, the system developed for the external façades would seem to be derived from a solution seen on the Indian worksites, which was described by Le Corbusier and developed by Xenakis⁶. It consists of the juxtaposition of narrow story-high reinforced concrete mullions, with grooves along the sides to house the sheets of glass. The latter are simply secured with mastic, without any fixtures. The distance between the reinforced concrete mullions is

determined by the Modulor measurements. For their positioning along the perimeter of the building Xenakis adopted “*quelques gammes de distances répétées sous forme d’ondes*”⁷, hence the suggested name of *pans ondulatoires* (undulating glazing)⁸. The system is based on a functional differentiation: lighting is provided by fixed glass panes, ventilation through *aréateurs* (aerators) — vertical slits equipped with a pivoting metal shutter, which controls the incoming air.

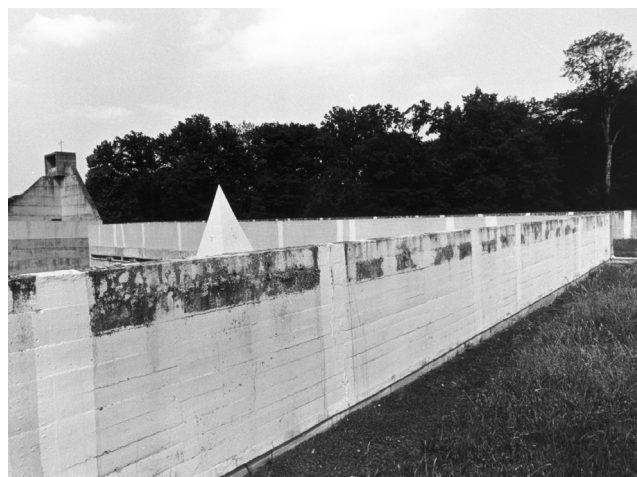
Le Corbusier attached particular importance to the above system, which he went on to use in several later projects⁹, to the extent that, in 1955, documentation was prepared to file a patent¹⁰, that was never however submitted, despite Le Corbusier’s insistence¹¹. Nonetheless, such documentation proves how important this cladding system, which allows complete independence from the position of the pillars of the load-bearing structure, was to the architect. The Convent’s *pans de verre ondulatoires*, the first ever built¹², are a milestone in the evolution of the *façade libre* (free façade), one of the *cinq points d’une architecture nouvelle* (five points of a new architecture) drafted in 1927.

The Le Corbusier Atelier Undertakes the First Repairs: Roof-Terraces and Acrotères

The church was consecrated in October 1960, and shortly after — before September 1961 — the roof-terraces had to be repaired for the first time. According to archival documents¹³, the original roof was built with a layer of pozzolana, applied so as to create a slope to discharge water, covered by a waterproofing membrane. A 15cm thick layer of soil was added directly above the latter, with the exception of a peripheral walkway, which Le Corbusier had left to allow the monks to walk on the roof, which he had conceived as a grass-covered terrace for prayer and meditation. After the first water seepage¹⁴, Le Corbusier assigned Fernand Gardien, his faithful collaborator who managed his late work sites in France, to personally oversee the repair work. The early failure of the waterproofing was probably due to the fact the contractor, Sud-Est Travaux



03 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953–1960. Aerial view from the North shortly after completion. © FLC/SPA.



04 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953–1960. The view of the roof-terrace after the second treatment of the fair-faced concrete in the 1970s. Note the white bands on the parapets. © FLC/SPA, ACT.

& Constructions, had not foreseen the need for expansion joints in the *acrotères* (i.e. the high parapets surrounding the roof-terrace)¹⁵. Consequently, as early as 1960, as proved by period archive sources and photographs, noticeable vertical or oblique cracks — also called “natural joints” — appeared along the *acrotères* (Figure 02)¹⁶. In September 1963, to eliminate roof leaks, the cracks were filled with *Polyjoint* special coating and the most exposed surfaces were subsequently treated with waterproof, *Polyfilm* plaster in a cement grey colour¹⁷. This product was used on the parapets, but probably also on the inclined organ surface, on the pyramid-like oratory roof and on the sloping wall of the crypt¹⁸. The use of such opaque waterproofing materials, which are clearly visible in the subsequent photographs (Figure 03), worried the monks who informed Gardien that the repair work covered and eliminated the grain and natural colour of the fair-faced concrete¹⁹. Gardien’s response left no doubts: Le Corbusier had examined and accepted the selected material, which was thus to be applied.²⁰ However, the repair work did not stop the leaks, since in March 1964 the contractor informed Gardien that the Polystrat Company would check the waterproofing work once again²¹.

Treatment of the Fair-Faced Concrete Surfaces in the Seventies

From then until 1979, when the Convent was listed (*classé*), no written documents have been found to indicate any work on the building. In France it is only once protection becomes official that interventions must be overseen by an *Architecte en Chef des Monuments Historiques* (ACMH), and that the latter is charged with filing information on any work performed on the listed building. However, a few datable sources and photographs show that new repair work was performed on parapet cracks (Figure 04); additionally²², layers of Paxalumin, a waterproofing membrane protected by an aluminum sheet, were applied on the roof-terraces.

In 1970 the owners of the Convent, which had seen a decline in the number of resident friars, decided to open the

complex to the public for visits and overnight stays, using the revenue to pay for overheads. This new *bâtellerie* use (hostel use) gradually introduced more stringent compliance issues.

The First Restoration and the Temptation to Complete the Architectural Work

During the early Eighties, owing to the continuing roof-terrace leaks, the *Association des Amis d'Eveux* (The Association of the Friends of Eveux — owner of the by then listed building), consulted Jean-Gabriel Mortamet, one of the ACMHs appointed to oversee the Rhône *département*. It is he who undertook the first important restoration campaign. After temporarily removing the soil from the roof-terraces, Mortamet insulated the horizontal surfaces and laid a new waterproofing membrane, all of this without removing the existing roof layers. He then repositioned the soil and added yet more to cover the entire terraces. The addition of this “package” over the existing layers raised the floor level by over 40cm around the perimeter, where walkways had originally existed, and required a vertical extension of the waterproofing layer by approximately 15cm, with the consequent creation of new lead flashings anchored in the parapets.

Concurrently, the cracks that had formed in the parapets were treated again. The *Polyjoint* and *Polyfilm* products were removed using a methylene chloride pickling process. New vertical joints were formed at regular intervals using a circular saw. All the joints — natural and artificial ones — were then sealed with plastic polyurethane foam and a coat of epoxy resin-based synthetic mastic was applied; lastly, a two-component elastomer sealer was used to create a smooth surface. All fair-faced concrete surfaces were then treated, especially where the concrete cover had spalled. The technique consisted in chemical cleaning, passivation of the steel bars, concrete patching, and lastly, application of a silicon-based waterproofing material. During the first stage (1982–1984) the parapets and terraces above the

cells, the chimney, and roof walkway were treated; during the second stage (1985–86) the *conduits* (walkways) and atrium; during the third and last stage (1986–87) the church parapets and terraces, the skylights of the crypt and the sacresty, the roof of the oratory, the organ surfaces and the loggia panels.

At the initiative of the *Association des Amis d'Eveux*, Mortamet also eliminated two existing church doors, which had not been built to Le Corbusier's designs, and replaced them with two pivot doors produced following the Master's original and never executed drawings. In 1989 the main South door was installed (Figure 05), followed by the North side door in 1993. This approach, based on completing the architect's work, clearly positions these interventions in an, as yet, embryonic stage of 20th century architecture conservation. Mortamet was indeed one of the first ACMHS in France to restore modern buildings. He belonged to a generation of professionals who had trained in a culture which had been "nourished" by the figure of Le Corbusier, and considered the master's works as design models — eventually needing to be finished off with a mimetic approach when they were incomplete — rather than as monuments to be preserved in the conditions in which they have reached us²³.

The Most Recent Intervention Campaign: Insightful Compliance Measures Thanks to the *Chargé de Mission Sécurité Incendie*

The 1990s witnessed a sequence of *Commission de Sécurité* injunctions for non-compliance with updated regulations for buildings open to the public. The warnings culminated with the departmental prefect threatening to close down the living quarters. Restoration and compliance thus became imperative and had to be implemented under very tight deadlines.

In the year 2000, after Mortamet reached the age of retirement, a new ACMH was urgently summoned, Didier Repellin. In 2002 he presented his preliminary study (*Etude Préalable*) and in 2006 he began the second restoration campaign that was completed in 2013. In view of the imminent risk of closure, the first issue to be considered was that of complying with the updated standards, notably fire safety regulations. The relevant commission required that a smoke detection system be installed, that the building be divided into fire resistant compartments (with the addition of new fire doors along the corridors, as well as the enclosure and fire protection of the stairs), and that interior fixtures provide up to 30 minutes fire resistance. The latter requirement would have entailed replacing all interior doors with fire doors: both the ones in the communal spaces and those of the cells, including their *volets d'aération* (ventilation louvers). In view of the impact such requirements would have had on the spatial and material features of the building, the ACMH appealed to a special official of the French heritage system: the *chargé de mission sécurité incendie* (fire safety attaché) attached to the *Ministère de la Culture*. In cases of thorny compliance issues and at the request of an ACMH, this Ministry consultant and former fireman is able to suggest alternative compliance measures that respect



05 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953-1960. South church pivot door built by Mortamet in 1989 following the unbuilt 1959 design of Le Corbusier. © FLC/SPA, ACT, Roberta Grignolo.

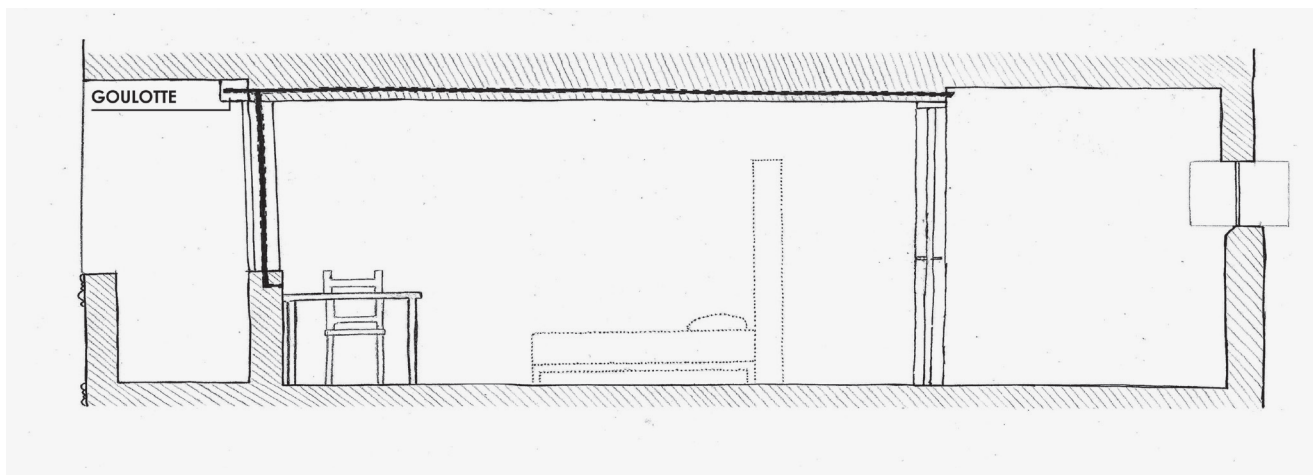
the specific features of a monument. The *chargé de mission's* inspection of *La Tourette*²⁴ was decisive: the reinforced concrete load-bearing structure was considered intrinsically fire resistant. The *chargé de mission* judged it necessary to generalize an early warning smoke detection system, and considered that to be a sufficient solution, thus no longer requiring the previously prescribed measures. Hence, dealing with regulatory requirements at the earliest stages of the project provided a solution that was compatible with the architectural quality of the convent.

Chasing Wiring Ducts inside Interior Walls

The addition of an aspirating smoke detection system and new electric cabling — the whole electrical system was replaced by a new one — followed the original design criteria. On the communal activity levels, all the wiring ducts run in full view on a horizontal grid along the upper part of the corridors. At the cell level the situation is more complex: originally the electric cabling in this area was chased through metal ducts, which were now unusable. New ducts (for smoke detection and electricity) were therefore chased into the walls by cutting into the concrete blocks. The visible parts of the smoke detectors are now limited to 1cm diameter pipes that protrude from the cell and corridor walls and are barely visible because of the rough finish of the plaster, which was reproduced to preserve the original indoor appearance.

Externally, Exposed Horizontal Ducts Convey Pipework to the Smoke Aspiration Units

On the outside of the building the solution adopted for the pipework is more visible. The aspiration units of the smoke detection system are placed at the center of each wing, in the loggias corresponding to the staircases. To avoid cutting costly and invasive chases in the reinforced concrete, the wiring of the smoke detection system and the new electric cabling were positioned outside the building, and run through the loggias to reach the aspiration unit. All pipework was placed in an exposed *goulotte* — a rectangular 8 × 15 cm plastic duct



06 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953-1960. Drawing showing the position of the wiring ducts added during the recent restoration. © Drawing by Aminah Costantini, Alice Piazzoli (AAM students) and Alessandra Castelbarco Albani (assistant).



07 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953-1960. View of the loggias with the wiring ducts running in the *goulotte* above the window fixtures. © FLC/SPA, Roberta Grignolo.



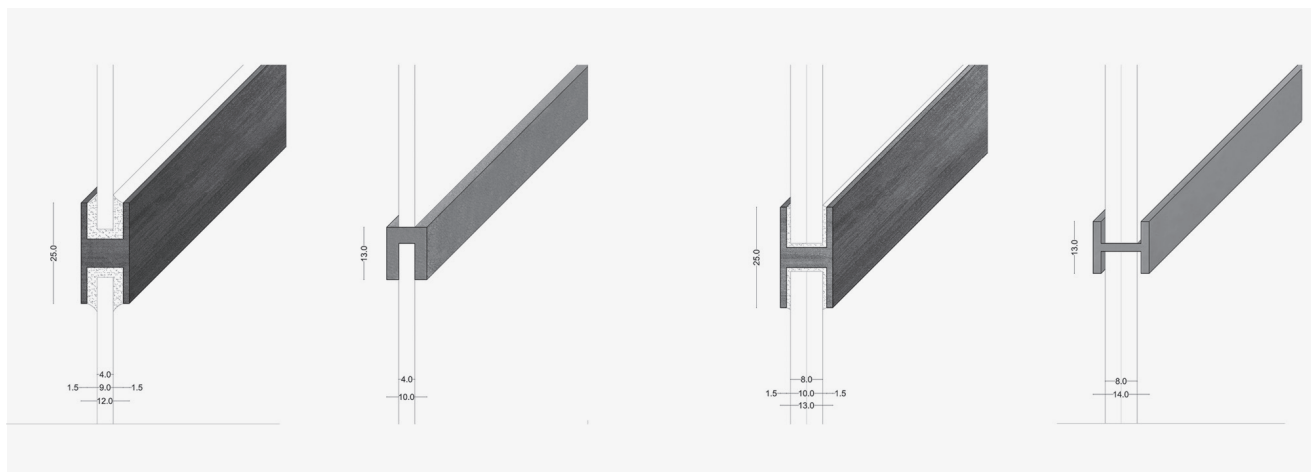
08 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953-1960. The fire detection system doesn't change the original appearance of the cell corridors. © FLC/SPA, Roberta Grignolo.



09 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953-1960. © FLC/SPA, ACT.



10 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953-1960. © FLC/SPA, Roberta Grignolo.



11 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953-1960. The *barlotières* (glazing bars) of the *pans de verre onduloires*: on the left the original solution (respectively the brass and the polyurethane from profiles), on the right the one adopted after several attempts (respectively the new brass and the new grey silicone profiles). © Drawings by Riccardo Cola, Davide Etter, Francesco Tadini (AAM students) and Alessandra Castelbarco Albani (assistant).

that contains the wiring — located along the upper corner of the loggias, running in full view above the window fixtures. The vertical path of the pipework was instead dealt with by inserting the *goulotte* inside the exterior *volet d'aération* (ventilation louver) of each room (the exterior *volet* — louver — provides ventilation to the cell and is located on the same plane as the window fixtures). Hidden inside the *volet*, the duct is thus visible only on close inspection.

Here additions are clearly discernible. There remains the further question of whether an alternative solution could have been found to avoid the fact that the *goulottes* alter the clarity of the external volume of the loggias “cut” into the concrete, possibly making them less visible from the outside, especially from the entrance to the convent (Figure 06–08).

Recovering the Original Level of the Roof-Terraces and their Meditational Dimension

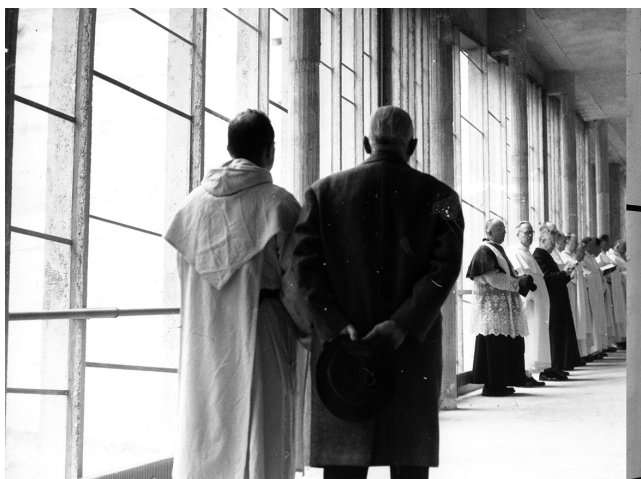
The other urgent issue that had to be dealt with was the waterproofing of the roof-terrace. Le Corbusier had conceived it as a place for meditation: the tall parapets were meant to allow the strolling monks to see no more than the distant horizon, eliminating all possible distractions due to the view of the immediate vicinity. With the numerous subsequent waterproofing interventions, several layers had been added on top of the original ones, leading to a considerable increase in the overall weight and height of the roof level. The ACMH decided to restore the original roof level. Consequently he removed all the added layers, and applied a new insulation and waterproofing membrane, retaining the original level. A raised floor of concrete tiles was placed where the perimeter walkway had been, and the existing soil was repositioned in the central area of each roof-terrace. Thanks to this intervention, the meditational dimension of the roof area was re-established.

Restoration of the Alleged Contrast between Fair-Faced Concrete and White Rough Plaster

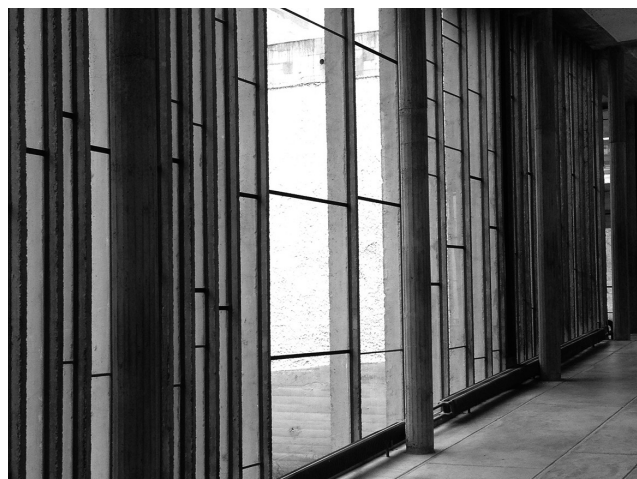
Another key issue concerned the façades, whether opaque or transparent. The opaque façades are partly fair-faced

concrete (exposed beams, blind facades), and partly concrete blocks covered in roughly textured plaster. The main problems in the concrete surfaces had occurred at roof level, where water had collected and caused the concrete of the parapets to deteriorate at the level of the highest slabs. In some cases, the corrosion of the steel bars caused concrete cracking and spalling. Other fair-faced concrete surfaces, especially sloping ones such as those of the oratory, the organ and the crypt, bore traces of dirt and microorganisms, and their surfaces appeared definitely darker. Concrete surfaces were cleaned using different techniques according to the extent of the deterioration (high pressure water, microgommage or cryogenic systems, the latter inside the church), the steel bars were passivated, and concrete patches were executed where necessary. Everything was then made uniform with limewash. Lastly, all the surfaces were treated with a water-repellent solution. The rough plaster surfaces were repaired wherever required and were all repainted with white mineral based slurry.

On visiting the convent one is inevitably led to reflect upon the issue of the aging of modern architecture surfaces, for which it is still problematic to apply the general principles of restoration, including the preservation of patina over time. In this case the aim of the ACMH was to restore the alleged original contrast between the grey, fair-faced concrete surfaces, and the lighter, white plastered parts. However it is difficult to grasp from original black and white photographs, how strong the contrast actually was. What is nonetheless certain, is that the colour photographs taken before the last intervention, show softer tones: the surfaces of the different materials all tend to take on the same warm, beige colour (Figure 09–10). If the linguistic and formal values of the façades might have seemed a little faded, the aged elevations undeniably bore significant documentary value and material culture. This is especially true when considering that the convent's fair-faced concrete surfaces were the outcome — in the second half of the 1950s — of a transfer of know-how from the civil engineering sector to the building sector. The workers of the Eveux site were



12 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953-1960. Le Corbusier in the *grand conduite* (main walkway) during the Convent inauguration ceremony. Note the single bar guard rail running along the *pan ondulatoire*. © FLC/SPA, ACT.



13 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953-1960. The main walkway after the last intervention: the railing has been removed, according to the alleged intentions of Le Corbusier. © FLC/SPA, Roberta Grignolo.

experts in fair-faced concrete surfaces and had acquired their experience and reputation building dams and mountain road bridges.

Pans de Verre Ondulatoires Restored à l'Identique

As to the transparent facades, the ACMH found the glazing in an advanced state of disrepair. The mastic which secured the glazing in the vertical grooves of the concrete mullions was dried out or missing, while the horizontal elements — *barlotières* according to the ACMH's denomination — which were placed between one glass pane and another were deteriorated. At *La Tourette*, Le Corbusier had used two types of horizontal profiles: the thicker ones ($h=25\text{mm}$) were brass H sections, which appeared to be bent and partly corroded; the more slender ones ($h=13\text{mm}$) were inverted U sections in a grey polyurethane foam, which had hardened, darkened and, for the most part, cracked. Moreover, the installation of the glazing directly in the concrete grooves, with no more than an interposed strip of mastic, tended to cause cracks in the glass plates owing to the different expansion properties of glass and concrete. There was, therefore, the risk that the glass sheets might break and fall from a considerable height.

Such a risk was heightened by the fact the ACMH wished to eliminate the *garde-corps* (guard rails), which in his view altered Le Corbusier's intentions. However several photographs — some of which are included in the *Oeuvre Complète*²⁵ — show that the guard rails along the *pans ondulatoires* of the study rooms, the refectory and the conduits, already existed at the time of the inauguration. There even are some shots of Le Corbusier seen from behind during the inauguration, in the company of "high ranking prelates", at the end of the ramp leading to the church, in which one can clearly see the parapets. Le Corbusier had thus seen and accepted them. Hence the ACMH's decision to remove them remains questionable (Figure 12–13). It contributed to dismantling the entire, original glazed system, with its simple 4 mm thick glazing, and to replacing it with 8 mm thick Stadip safety glass.

Initially, only the lower parts of the glazing were to be replaced, because of the substantial risk that the glazing might fall outwards if impacted from inside the building. However, during the construction stage, two types of issues developed, technical and aesthetic ones. From a technical standpoint, to achieve the air and water tightness of the envelope, the perimeter mastic joints had to be redone and the broken window panes and foam *barlotières* needed to be replaced. Such interventions, that would have required the removal of all the upper panes followed by their repositioning after the lower ones had been installed, would have been too expensive and in any event there was the risk that the original glass panes might break. From an aesthetic standpoint, the different thickness between the original glazing (4 mm) and the new (8 mm) would have produced a difference in hue and transparency: the prototypes of the new glazing custom-made by Saint Gobain had a slightly different colour; in addition, the new glazing would have been more transparent than the original glass that had become a little cloudy. Such considerations led, in 2007, to the decision to replace the full story-high, original panes of glass.

Thus, on the west facade of the west wing, which was treated during the first restoration phase, the brass *barlotières* were replaced with natural anodised aluminium sections — with a shiny, reflecting, grey appearance — in a direct reference to the solutions that had recently been implemented during the restoration of Le Corbusier's Firminy buildings, while the foam *barlotières* were replaced by translucent plastic sections. This solution found little favour with visitors and experts, some of whom complained directly to the FLC, which had only recently been informed that a restoration campaign was underway.

The well-known architectural historian William J.R. Curtis wrote several letters to the FLC, following his visits to the convent during the restoration. He noted that the reflecting aluminium *barlotières* had done away with the backlit "Mondrian effect", while the translucent silicone ones had rounded corners, which in no way matched the precision of the original solution. Curtis thus argued Le Corbusier's and



14 Le Corbusier, *Couvent de La Tourette*, Eveux, France, 1953–1960. The *canons à lumière* (skylights) of the crypt: on the left the original solution; in the center the fixtures added by the ACMH Mortamet during the first restoration, on the right the fixtures after the last intervention. © FLC/ADAGP; left: FLC, centre: Carolina Di Biase; Right: Roberto Grignolo.

Xenakis' precision and visual music had been totally lost, especially when considering the statement attributed to Le Corbusier that "*l'architecture est une question de millimètres*" ("architecture is a question of millimeters").

Hence, during the second stage of the restoration work, an attempt was made to improve the translucent west facade joints, by painting them anthracite. Furthermore, a new solution was developed for the *barlotières* of the south and east facades: the metal ones were manufactured in brass coloured anodised aluminium and the foam ones were custom-made in light grey opaque silicone, allegedly the same colour as the original joints. They were designed with an H section to improve the stability of the glass panes, but with the external dimensions of the originals.

Another modification was devised following a visit by one of the FLC representatives, according to whom the facsimile aluminium solution betrayed the designer's intentions with respect to the use of materials. In the final solution the metal *barlotières* were made to match the original in brass, using a custom-designed manufacturing process (Figure 11). Initially this possibility had been rejected because of its high cost, but it was subsequently authorised following criticism from the scientific community.

The brass *barlotières*, produced with a section identical to the original ones, were positioned in the *conduits* (walkways), but in other areas one still finds the solutions that had been devised during the restoration site work and then improved upon. Thus today diverse restoration solutions for the *pans de verre* co-exist. It consequently becomes essential that interventions be recorded, to avoid that in the future it be mistakenly believed that today's differences are indeed original ones.

The identical restoration of the *pans de verre* has re-established the crucial play of light and shadow in the walkways. One might, however, lament that no part of the original facade was preserved. In this case, such diligence would have allowed us to appreciate the characteristics of the

original glass panes, which were totally different to the ones available today in terms of colour, thickness, smoothness, reflectance, aging, etc. This loss means that today's observers no longer have any way to make comparisons, an essential element in furthering advances in this discipline.

***Canons à Lumière* Fixtures:**

the Repeated Correction of a Flawed Detail

Lastly, the conical skylight fixtures were modified, since they had been a source of leaks ever since the inauguration of the complex. Originally, water drainage only occurred through five small cannulas (tubes) placed at the base of the sloping windows, causing leak marks and stains on the interior plaster. In a similar manner to the *pans ondulatoires*, Le Corbusier's intention was to achieve direct contact between different materials, without any window fixture: glass panes were positioned on the upper concrete edges of the skylights, with no more than a strip of mastic in between — an experimental detail that proved to be flawed. Over time, several interventions attempted to solve the problem: initially an edged metal sheet was created to collect and drain water from the lower part of each skylight; then, during Mortamet's restoration campaign, continuous vertical flashing, almost 10 cm high, was installed all around the perimeter of the skylights, totally distorting the original detail. Finally, during the most recent intervention, the ACMH positioned the perimeter flashing on the same plane as the glazing. Thanks to the material that was chosen — grey, brushed steel — the flashing merges with the upper concrete edge of the *canons*. From a distance the new detail appears thus similar to the original one (Figure 14).

Interior Polychromy:

from a Visual Approach to Stratigraphic Tests

Another issue that should be mentioned is interior polychromy as related to the skylights and to the church, and so crucial to the Master's project. The FLC's involvement, while

work was in progress on the project, led to stratigraphic tests being performed on the colours of the church interiors in 2011. The tests revealed how they had originally been applied using a single colored layer on a layer of white paint to achieve greater brightness. In addition, while some of the surfaces still bore traces of the original paint, in other areas it had been covered and changed. The ACMH thus restored the original colours according to the findings of the stratigraphic tests; in some cases the surfaces were simply cleaned, in others a new layer of paint was applied.

Towards Cooperation between the Fondation Le Corbusier and Conservation Architects?

The resumption of contact related to the above issues with the FLC and the positive outcome of the collaborative work developed together, inspires hope for the future. It remains desirable that a cooperation protocol be drafted between the Ministry of Culture (which holds legal responsibility for the protection of architectural works) and the FLC (as heir to the architect's moral rights) that will ensure these stakeholders work in synergy and leverage their respective fields of competence. The FLC can capitalize on the ACMHs' experience on the ground; the latter should be encouraged to dialogue with the FLC and especially with the *comité d'experts*, which comprises experts in the fields of the history and conservation of 20th century architecture. If constructive dialogue develops while a project is in progress — instead of once it has been completed — such a collective tool, with its yet unrealised potential, will at last fully achieve its purpose. ■

Notes

- 1 Fondation Le Corbusier, Paris (FLC); Direction Régionale des Affaires Culturelles, Lyon (DRAC); Archives Départementales du Rhône, Lyon (ADR); Archives du Couvent de La Tourette, Eveux-sur-l'Arbresle (ACT); Médiathèque du Patrimoine, Paris (MP).
- 2 "Reuse and restoration of 20th Century Heritage" course, a.a. 2013–2014. During a full semester students compared documents from several archival sources, they surveyed parts of the building, mapped interventions, debated with the architects in charge, and lastly produced a wealth of documentation related to the transformations of the Convent from the date of its inauguration in 1960, to the present day. I would like to thank the students of the course and especially those whose "theoretical papers" pursued further research into archival material: Veronica Ghislanzoni, Elena Guerra, Lucrezia Rapillo and Alessandra Aponi. I also wish to thank the *Architecte en Chef des Monuments Historiques* Didier Repellin and his team who generously provided students with drawings, documentation and field expertise.
- 3 Sergio Ferro, Chérif Kebbal, Philippe Potié, Cyrille Simonnet, *Le Corbusier, Le Couvent de La Tourette*, Marseille, Editions Parenthèses, 1987, p. 12.
- 4 Le Corbusier on the Charterhouse of Ema, in Galluzzo (Tuscany), in William J.R. Curtis, *Le Corbusier: Ideas and Forms*, Oxford, Phaidon, 1986, p. 181.
- 5 Conversation of Le Corbusier with the Dominican community, October 1960, in "Le Couvent Sainte-Marie de La Tourette construit par Le Corbusier", *L'Art Sacré*, n. 7–8, mars-avril 1960.
- 6 Nouritza Matossian, *Iannis Xenakis*, Paris, Fayard-Fondation Sacem, 1981, p. 78–79.
- 7 Iannis Xenakis, *Note Relative aux Pans de Verre Dénommés "Ondulatoires"*, 12 July 1955 [FLC T2–7–253].
- 8 The vertical concrete mullions are set at varying distances along the facade suggesting the frequency waves on an oscilloscope screen so they do not literally "undulate" but suggest the movement of electron-ic waves (editor's note).

- 9 E.g. the *Maison du Brésil* at the Cité Universitaire in Paris (1953–59), the *Maison de la Culture* in Firminy (1961–65) and the Carpenter Center in Cambridge (1961–63).
- 10 Le Corbusier, *Brevet ou Modèle déposé pour les Pans de Verre Fénomés "Ondulatoires"*, 12 July 1955 [FLC T2–7–251]; Iannis Xenakis, *Note Relative aux Pans de Verre Dénommés "Ondulatoires"*, 12 July 1955 [FLC T2–7–253].
- 11 *Note pour Wogensky dictée par L–C*, 8 juin 1955 [FLC T2–7–250]; *Note pour Xenakis dictée par L–C*, 6 octobre 1955 [FLC K3–7–781].
- 12 Willy Boesiger, *Le Corbusier et Son Atelier Rue de Sèvres 35, Oeuvre Complète 1957–1965*, Zurich, Girsberger, 1965, p. 32.
- 13 Letter from Fernand Gardien (for André Wogensky) to M. Quignon (Etanchéité sols, murs), 18 January 1957 [FLC K3–2–183–002].
- 14 The terraces started to leak even before the Convent was inaugurated in October 1958. Letter from Fernand Gardien and Georges Marc Présenté to the Etablissements Quignon, 14 October 1958 [FLC K3–2–212].
- 15 Letter from M. Plaisantin (Sud-Est Travaux & Constructions) to Fernand Gardien, 22 August 1963 [FLC K3–12–53].
- 16 As early as February 1960, the construction company Sud-Est Travaux & Constructions, was contracted for initial repairs to the cracks in the parapets, applying Seelastik or a similar product. Letter from M. Quignon to the Atelier Le Corbusier, 25 February 1960 [FLC K3–2–227].
- 17 Letter from J. Liling (Polystrat Company) to M. Plaisantin (Sud-Est Travaux), 14 December 1962 [FLC K3–12–129]. *Polyjoint* and *Polyfilm* were produced by the Polystrat Firm (today disappeared), whose production was located in Joinville-le-Pont.
- 18 Letter from Father Genuyt to Fernand Gardien, 4 October 1963 [FLC K3–15–502].
- 19 *Idem*.
- 20 Letter from Fernand Gardien to Father Genuyt, 9 October 1963 [FLC K3–15–504].
- 21 Letter from M. Plaisantin (Sud-Est Travaux) to Fernand Gardien, 20 October 1964 [FLC K3–12–76].
- 22 According to the ACMH Mortamet, repairs on the parapet cracks with *bandes plastiques* were carried out in 1974–75 (*Archives Départementales du Rhône, Archives de J.-G. Mortamet, Rhône hors Lyon, Eveux*, 103 J 66).
- 23 See the paper by François Goven, "Le Corbusier et le Monument Moderne: la Patrimonialisation de l'Architecture du xxe siècle en France (d') après Le Corbusier", at the recent conference *Le Corbusier: l'Oeuvre à l'Épreuve de sa Restauration*, XIX^e Rencontre de la Fondation Le Corbusier, Fondation Le Corbusier-Institut National d'Histoire de l'Art, Paris, 16–18 April 2015.
- 24 At the time, the position was held by Lieutenant-Colonel Jean-Paul Spiess.
- 25 Willy Boesiger, *op. cit.*, p. 40 and p. 44.

References

- Archives de la Direction Régionale des Affaires Culturelles, Lyon (DRAC).
Archives de la Fondation Le Corbusier, Paris (FLC).
Archives Départementales du Rhône, Lyon (ADR).
Archives du Couvent de La Tourette, Eveux (ACT).
BOESIGER, Willy, *Le Corbusier et Son Atelier Rue de Sèvres 35, Œuvre Complète 1957–1965*, Zurich, Girsberger, 1965.
FERRO, Sergio; KEBBAL, Chérif; POTIÉ, Philippe; SIMONNET, Cyrille, *Le Corbusier, Le Couvent de La Tourette*, Marseille, Editions Parenthèses, 1987.
Médiathèque du Patrimoine, Paris (MP).
PETIT, Jean, *Un Couvent de Le Corbusier*, Paris, Les Editions de Minuit, 1961.
POTIÉ, Philippe *Le Corbusier: Le Couvent Sainte Marie de La Tourette/The Monastery of Sainte Marie de La Tourette*, Basel, Birkhäuser, 2001.
REPELLIN, Didier, "La restauration du Couvent Sainte-Marie de La Tourette, Eveux, Rhône-Alpes. Le chantier de restauration", *Monumental*, 2013, Semester II, p. 100–102.

Roberta Grignolo

Assistant Professor of Restoration and Reuse of 20th Century Architecture at the *Accademia di Architettura in Mendrisio, Università della Svizzera italiana* (USI), since 2009. She was co-leader of the research project *Critical Encyclopaedia for Restoration and Reuse of 20th Century Architecture*, a partnership between USI, EPFL, ETHZ and SUPSI (2009–2012).



Le Corbusier, National Museum of Western Art, Tokyo, Japan, 1959. © NMWA, 2007.

National Museum of Western Art as Important Cultural Property of Japan: its Evolution and Historical Value

BY YOSHIYUKI YAMANA AND KYO FUKUDA

Starting with the conception of the World Museum as part of the 1929 Mundaneum project, Le Corbusier continued to develop and refine that concept. The main building of the National Museum of Western Art completed in 1959, was also designed as a Museum of Unlimited Expansion prototype. NMWA has undergone conservation work and seismic base isolation work a number of times, and is therefore in generally good condition. The principal conservation works to the main building since its completion is summarized in this essay, along with other construction, extension and maintenance work carried out on the grounds.

The National Museum of Western Art (NMWA), in Tokyo, was constructed in April 1959 in order to house and display the Matsukata Collection, after its repatriation to Japan as a gift of the French government.

The Matsukata Collection originated as a collection of works of European painting and sculpture, assembled and purchased between 1916 and 1923 by MATSUKATA Kojiro, first president of the Kawasaki Dockyard Company, using his private fortune. A significant portion of the collection remained in France through World War II, at the end of which it was confiscated by the French government as property of an enemy national and, with the signing of the San Francisco Peace Treaty in 1951, it officially became the national property of France. After eight years of negotiations, the French government decided to donate the collection to Japan as a symbol of the restoration of friendly relations between the two countries, on the condition that a museum was built to house the artworks. Ueno Park in Tokyo was selected as the site for the new museum, and the architect, Le Corbusier, was chosen to design it.

Detailed construction plans and project management were undertaken by Kunio Mayekawa, Junzo Sakakura, and Takamasa Yoshizaka, Japanese architects who had worked in Le Corbusier's *Atelier Rue de Sevres* 35. The building was completed in 1959, and has welcomed many visitors over the past 56 years.

The main building of the NMWA is prized as the sole example of the work of Le Corbusier surviving in Japan, and in recognition of both its historical and architectural value, it was designated as an Important Cultural Property on December 21, 2007. The forecourt garden and adjacent areas of the site reflect Le Corbusier's design theories and the landscape connecting the garden with Ueno Park maintains the scenic beauty of its original conception;

because of this, the museum site were officially listed as a Registered Monument/Place of Scenic Beauty on July 23, 2009.

The main building of the NMWA is a realization of such elements of Le Corbusier's *Five Points of a New Architecture* as the use of *pilotis*, a roof garden, and a free plan. Employing Le Corbusier's signature *Modulor* approach to proportions throughout its design, the building is also one of only three extant prototypes of the architect's concept for a Museum of Unlimited Growth. For all of these reasons, it has received much international attention and acclaim.

The NMWA hopes to use the present plan as a basis for more faithfully preserving the spatial conception of Le Corbusier's Museum of Unlimited Growth and highlighting the architectural beauty of the museum's main building¹.

National Museum of Western Art as a Prototype for a Museum of Unlimited Growth

Amongst various prototypes of that nature, the model Le Corbusier conceived for museums was the Museum of Unlimited Expansion (MUE). Starting with the conception of the World Museum as part of the 1929 *Mundaneum* project, Le Corbusier continued to develop and refine that concept. The main building of the NMWA completed in 1959, was also designed as a MUE prototype.

The Mundaneum Project

Le Corbusier produced the *Mundaneum* project in 1928 on land adjacent to the League of Nations property in Geneva, after being commissioned by Paul Otlet, a Belgian jurist, documentalist and internationalist. 1928 was the year following Le Corbusier's bitter experience of initially having his competition proposal for the Palace of the League of Nations (1927) selected, only for it to be rejected following opposition by old-guard architects.

One significant aspect of the *Mundaneum* project by Le Corbusier and Otlé was that it was an attempt to increase international cooperation through mutual cultural appreciation at a time when political ax grinding by the various countries in the League of Nations was making such cooperation difficult. The immense World Museum formed the nucleus of this project.

The World Museum had a pyramidal cross-section with a large internal atrium and was composed so that visitors would enter from a forecourt or *parvis*, pass the *pilotis*, take a central elevator directly to the top of the building and then descend down from the top floor following a square spiral ramp comprising the exhibition hall. It was also designed so that each time visitors turned a corner of the square spiral exhibition hall they could enjoy the scenery outside. Subsequently, this World Museum developed into the MUE, Le Corbusier's museum prototype of choice, which formed the basis for other plans including the NMWA.

From Museum of Contemporary Art in Paris, to Museum of Unlimited Expansion, Philippeville, 1939

Between 1929 and 1930, Le Corbusier reworked the World Museum at his *atelier* in Sevres, Paris, into a composition of abstract geometry, and developed the idea of the square spiral museum, which is associated with the MUE. Le Corbusier's concept of the square spiral museum was first expressed explicitly in his letter to Christian Zervos, the editor-in-chief of *Cahiers d'Art*, a Paris-based magazine, in its February 19, 1930 issue. The idea of "unlimited expansion" not only addressed the problem at the time of how to deal with continuously expanding collections, but was also based on the assumption that groups of donors would contribute to the construction of museums. Coinciding with the period of the above developments, Kunio Mayekawa (1905–1986) was an apprentice in Le Corbusier's Paris *atelier* from 1928 to 1930. During his time at the *atelier*, Mayekawa witnessed activities relating to the Palace of the League of Nations scandals, the *Mundaneum* project and the Museum of Contemporary Art in Paris.

From June 1931, following publication of the museum concept in *Cahiers d'Art*, Le Corbusier presented a specific proposal — *Musée des Artistes Vivants* — using a site in Nesle-la-Vallée, the eastern suburbs of Paris. In that project, Le Corbusier determined modular dimensions under which, for example, one spatial unit is shown as seven meters square by 8 meters high and the central hall is 14 meters square, the size of 4 spatial units.

Following that project, while Le Corbusier incorporated the idea of a MUE as the nucleus of urban culture into his urban design proposals, in his urban design projects such as the *Pan Macia* in Barcelona, Spain (1933) and the *Rive Gauche de l'Escaut* in Antwerp, Belgium, Le Corbusier adopted a pyramidal form similar to the World Museum in the *Mundaneum* project. Whereas, in his design for the Center for Contemporary Art in Paris for the Paris Exposition 1937, an expandable museum based on his proposal for the 1931 Museum of Contemporary Art in Paris, Le Corbusier

made detailed studies into potential materials and construction methods. For example, in removable industrialized dry construction methods, such materials as asbestos panels, galvanized steel sheet panels and copper sheet panels were widely used for the external walls, and materials like bricks and glass-blocks were used for the *pilotis* at ground level.

The thinking behind this approach can also be seen in the construction methods of numerous other pavilions at the Paris Exposition 1937. This was probably influenced by the strong interest that the French construction industry had in dry construction methods at the time.

After the *Mundaneum* project, Le Corbusier continued to produce square spiral ramp museum designs. For the Philippeville City Museum project proposal in Algeria, Le Corbusier gave the following explanation:

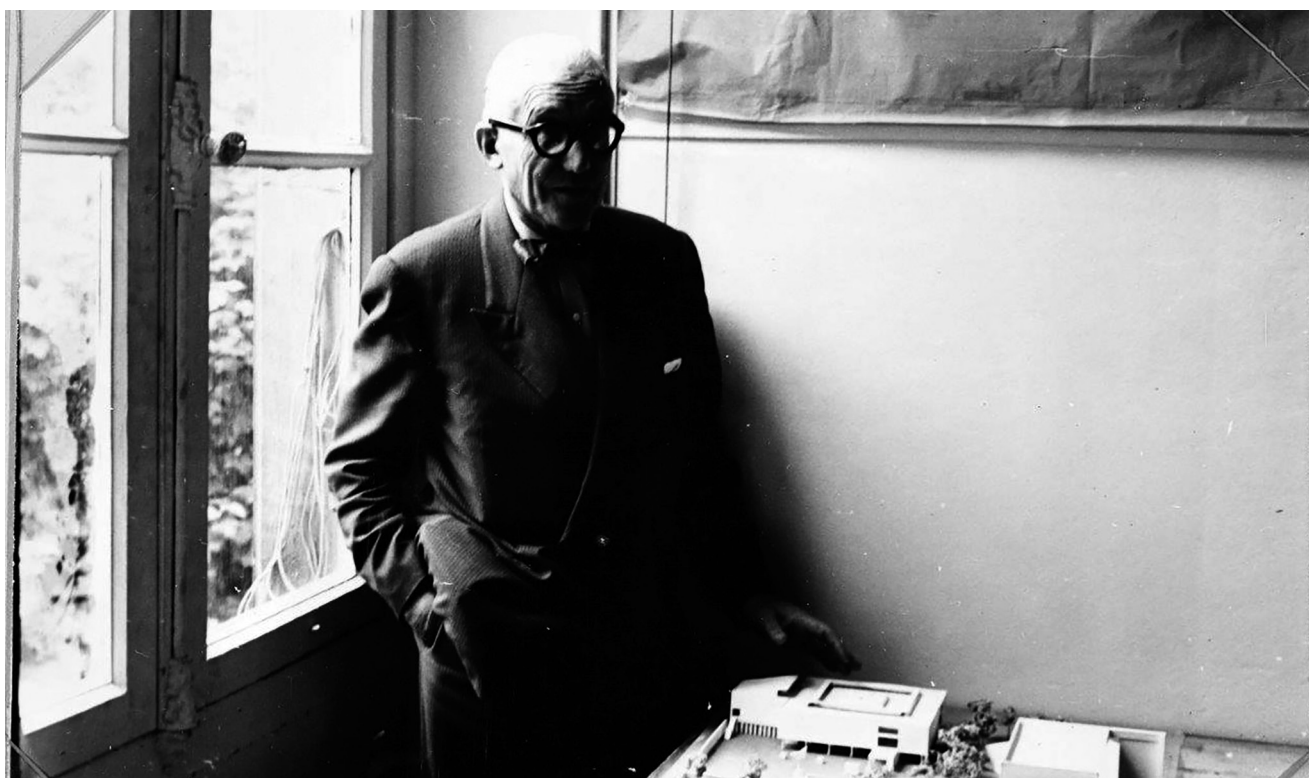
The problem of extension of buildings is a task of our time, for which, until now, no solution has been found. A series of studies over a period of ten years has led to a notable result: complete standardization of the structural elements: the totality is laid out according to the Golden Section and permits an unlimited number of harmonious combinations. The fundamental principle of this Museum is that it is built on columns, the entrance at ground level is in the center of the building hall of honor, destined to house several masterpieces.

Junzo Sakakura was present in Le Corbusier's *atelier* from 1931 to 1936, coinciding with the period leading up to completion of this prototype. Sakakura, who played a central role as an assistant designer for the NMWA project, was indeed present during the exact period that research was being conducted into the MUE, so he would have been able to observe Le Corbusier and his process leading up to completion of the prototype first hand.

Comparisons can be drawn between the architectural composition and use of materials in the above-mentioned Museum of Contemporary Art in Paris and Sakakura's representative work, the Kanagawa Prefectural Museum of Modern Art, Kamakura (1951). Sakakura's Museum was completed before any of Le Corbusier's MUE projects. When Le Corbusier came to Japan to inspect the site of the National Museum of Western Art in 1954, he made his way to Kamakura and visited the completed museum. At that time he presumably noted the size of the external courtyard. In any case, the central hall of the MUE, which had previously been an internal hall, was subsequently designed as an external courtyard in the Sanskar Kendra City Museum, which was designed starting from 1951.

Le Modulor

In the first section of *Le Modulor* published in 1948, Le Corbusier touches on the beginnings of his research into the *Modulor*. When discussing its "mathematical calculation", he gives the MUE as the third example, and cites the use of three standardized elements based on the golden section — standard columns, standard beams and standard ceiling lighting (for day and for night) — as an application of *Modulor* dimensions achieving a sense of organic unity. In *Modulor 2* in 1955,



01 Le Corbusier and model of NMWA, Atelier Rue de Sèvres 35. © NMWA, 1956.

one bay size of the grid in the Sanskar Kendra City Museum is given as seven meters square, and the same dimensions are given in Le Corbusier's *Œuvre Complete* (Complete Works). However, one bay size of the grid in the Sanskar Kendra City Museum, as built, is actually 6.35 meters square and the same dimension is applied in the NMWA. The 7 meters square bay size of the grid was realized only in the Chandigarh Museum and Art Gallery, completed posthumously, and it somehow gives a sluggishly stretched impression.

Takamasa Yoshizaka (1917–1980) was present in Le Corbusier's atelier from 1950 to 1952, during the period that the *Modulor* was being developed. Amongst other works, he was responsible for the *Unité d'Habitation* projects in Marseilles and Nantes, which were designed using the *Modulor*, therefore, he had a direct experience of putting the *Modulor* into practice with Le Corbusier himself. In 1953, after his return to Japan, Yoshizaka translated and published *Le Modulor*, and subsequently contributed to preparing the design details and working drawings for the construction of the NMWA while teaching at Waseda University.

National Museum of Western Art: A Realized Museum of Unlimited Expansion

To what extent were the prototype ideas, such as *pilotis*, the swastika form and expansion in a spiral, put into practice in the three museums based on the MUE prototype realized after the war?

First, with regard to *pilotis*, as a feature in each of the museums, visitors “enter between *pilotis*, directly access the main central hall in the building, climb the ramp in the main central hall's atrium space and arrive at the second floor exhibition gallery space”. On the other hand, in relation to

the statement “the second floor has a square plan, with the exhibition gallery spaces arranged in a spiral around the periphery of the main central hall. The exhibition gallery space is arranged in a swastika configuration within the overall square plan forming a *mezzanine* floor in the two story atrium”, the basic spatial composition is in place, but the “lighting from above arranged in a *swastika*” was what Le Corbusier placed the most importance on, in which “lighting facilities (natural and artificial) are arranged in a swastika configuration on part of the third floor” was achieved only in the NMWA.

How about the possible expansion in a spiral form? For each of the three museums, even though the concept that “each time the number of artifacts increases, the exhibition hall can be extended in a spiral shape and grow unlimitedly. Constructed with standardized and industrialized architectural components and designed so that the building maintained the same aesthetic of industrialization” was considered at the stage of the original spatial composition, the site conditions and other factors became stumbling blocks and to this day nothing has been realized exactly as conceived in the prototype.

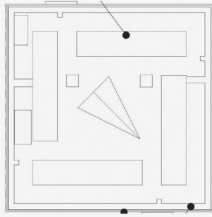
At the same time, all of the museums have, nevertheless, implemented the “aesthetic of industrialization” that Le Corbusier sought and have been built in a form that applies the *Modulor* dimensioning system and so on. With regard to the application of the *Modulor* dimensioning to the NMWA, the *Modulor* was applied to the height of the exhibition gallery space, the rhythmic louvers around the circumference of the first floor enclosure, the external wall panels, the forecourt pavement, and various other parts of the museum.

	0 1959	1 1961–71	2 1972–84
Roof/ exteriorwalls		1964 Light fixtures in internally cured concrete lattice added. 1965 Flowerbed removed.	New wing completed; 1980 Lighting foundations removed 1977 Exterior wall maintained 1982 New exterior eaves added
3rd. Floor		1964 Light fixtures added. 1966 Tableau hanging system removed.	New storage facility built. New connecting passageway built. Exterior wall removed.
2nd. Floor		1973 Dehumidified exhibition area created.	Wooden walls fireproofed. Louvers removed
1st. Floor		1967 Insect screening removed. 1964 Light fixtures added.	Wooden walls fireproofed. Some pilotis incorporated into interior.
B1F		1965 Extension to tea room built	1979 Conservation and maintenance work carried out on main building
Scope of conservation works and function after changes Exhibition Management of works Management Visitor Services Scope of conservation work (not entailing changes in functions)			

02 Table 1 Evolution of the Main Building of the NMWA. "0. When first built (1959)" and "5.1988 to Present (2013)" show functions then and now.

3 1985-93

1988 New interior electric curtains installed



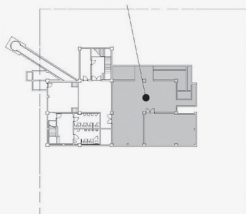
1986 Exterior walls surveyed

1988 Horizontal ducts upgraded



1985 Conservation work carried out on Main Building's interior walls along other work

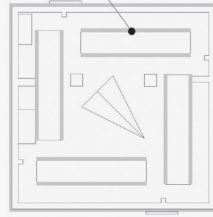
Air conditioners upgraded



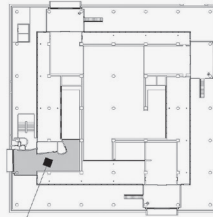
4 1994-97

New Special Exhibition Wing completed

1977 Corrugated glass coated



1994 Preservation work carried out on main building's exterior walls along with other work



Partitions, etc. removed



2001 Glass division created

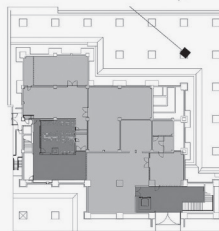
Partition, etc. altered



Staircase 2: removal and installation work

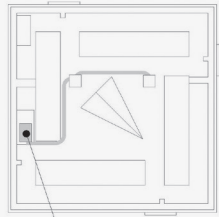
Staircase 1: removal and installation work

New base isolation system installed



1988 Seismic strengthening work carried out on main building along with other work

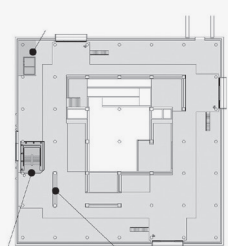
5 1998 to present



Elevated water tank upgraded

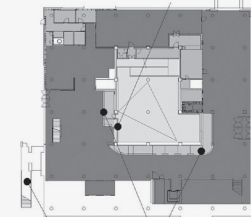


Walls installed



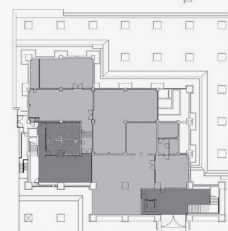
2009 Walls installed

2001 Glass division created

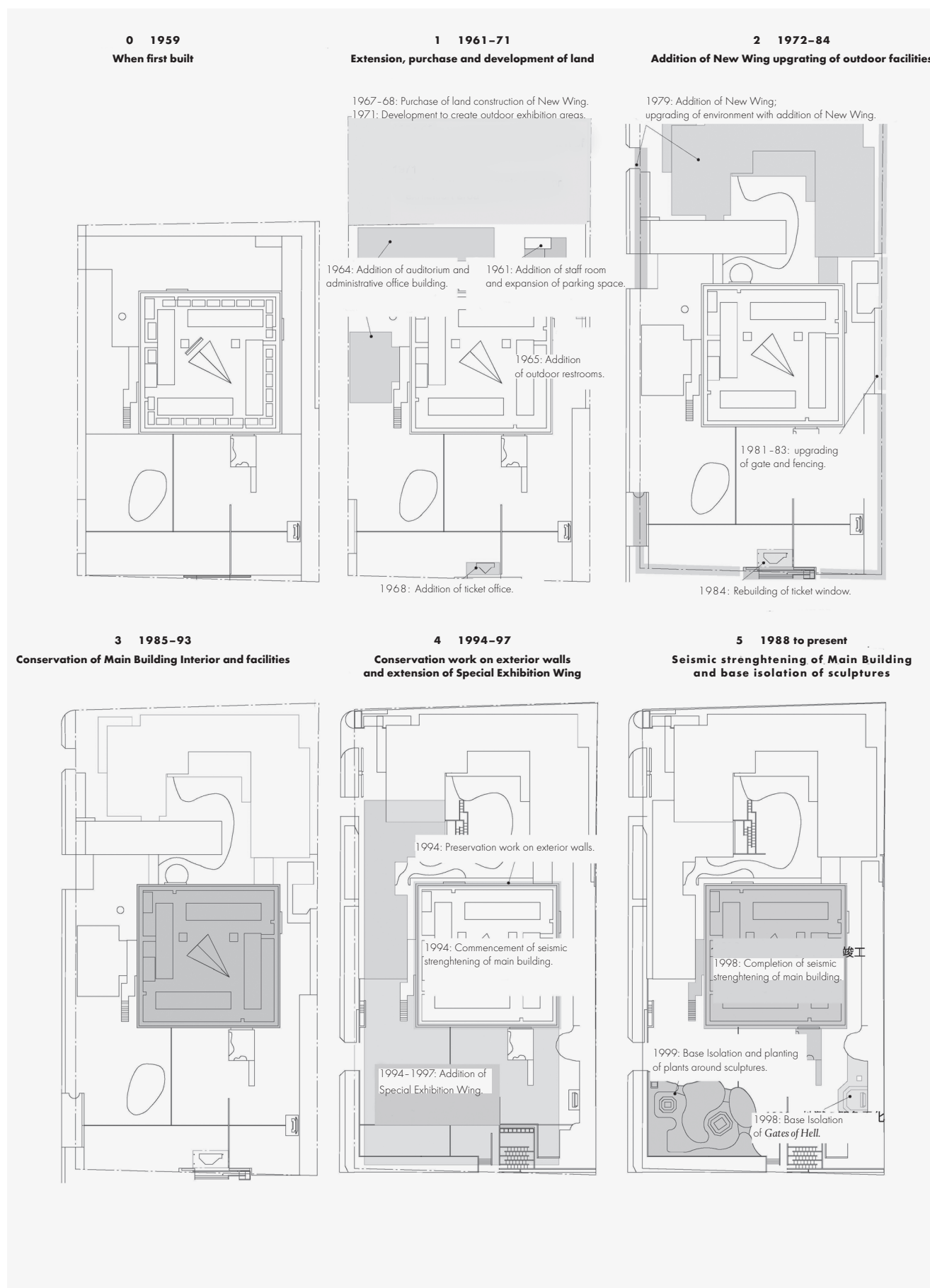


2003 New storage facility built

2009 New partitioning wall erected



Present



03 Table 2. Changes to constituents of grounds of the NMWA.

According to the explanation of the MUE prototype, the initial form of the museum prior to expansion requires a square plan with a size of seven spans east to west and seven spans north to south. Of the three realized museums, the plans of the two built in India, the Sanskar Kendra City Museum and Chandigarh Museum and Art Gallery were built with a grid of 7 bays by 7 bays, but the museum built in Japan, the NMWA consists of a grid of only 6 bays by 6 bays.

In comparison to the two museums in India, where plentiful space can be secured, the NMWA has a very spacious forecourt, but both sides of the main building are narrow and the future extension planned the concept of the MUE would become difficult to achieve due to site restrictions. In addition to the number of spans in the grid being reduced by one in each direction to a grid of 6 by 6 spans, the size of each span is also reduced from 7 to 6.35 meters as with the Sanskar Kendra City Museum in Ahmedabad, making the museum small overall. Also, as a result of having one less span, the ramp in the central hall going from the first floor to the second floor lies under the skylights arranged in a swastika pattern, thus light floods into the main hall directly from the skylights. Also, because of the ramp, the width of the northern side of the exhibition gallery space becomes one span wide, giving a different plan composition from the other museums.

Evolution of the Main Building of the National Museum of Western Art

The main building has undergone conservation work and seismic base isolation work a number of times, and is therefore in generally good condition. The principal conservation works to the main building since its completion are summarized below, along with other construction, extension, and maintenance work carried out on the grounds. The areas of conservation made to the main building are shown in Table 2.

- 1959: Completion.
- 1961–71: Extension, purchase and development of land. Staff rooms and garage space were expanded in 1961 and outdoor restrooms were added in 1965. Also in 1965, the rooftop flowerbed was removed. Land for construction of a new building on the north side of the site was purchased in two phases in 1967 and 1968. In 1968, a new ticket office was built in the south of the site.
- 1972–84: Construction and extension of new building, upgrading of the exterior. Construction of a new wing commenced in 1977 and was completed in 1979. Some of the main building's *pilotis* were, at the same time, incorporated into the interior. Between 1981 and 1983, upgrading work was carried out on the exterior, including around the gates and fencing work.
- 1985–93: Work on main building interior and facilities. Maintenance work was carried out on interior walls and other parts of the interior.
- 1994–97: Preservation work on exterior walls and addition of special exhibition wing. The main building's outer walls underwent preservation work in 1994. The special exhibition wing was commenced in 1994 and completed in 1997.
- 1998 to present: Seismic strengthening of main building

and base isolation of sculptures. Seismic strengthening was carried out around the time that the special exhibition wing was added, and base isolation of the main building was completed in 1998. (Table 1: Evolution of the Main Building of the NMWA).

The grounds of the NMWA were registered under the name "Grounds of the NMWA" as an officially Registered Monument of Japan in the "Place of Scenic Beauty" category in July 2009. The NMWA consists of a main building, new wing, and special exhibition wing. The 7,079.8 m² south side of the site, on which stands the main building (Important Cultural Property in the "Building" category), is owned by the Tokyo Metropolitan Government, and is leased from Tokyo by the Independent Administrative Institution National Museum of Art. The 2,207 square-meter north side of the site consists of land that was purchased in 1967 and 1968 by the then Ministry of Education for construction of the New Wing.

Work in the grounds as well as on the buildings of the NMWA has been overseen and completed jointly by Junzo Sakakura, Kunio Mayekawa, and Takamasa Yoshizaka. Design and supervision of modifications such as conservation and extension work carried out since completion of the museum has also been carried out either by Sakakura's or Mayekawa's design offices. Major modifications are listed below and shown in Table 2.

- 1964: Addition of auditorium on west side and administrative office building on north side of main building (Sakakura Associates, Inc.).
- 1968: Addition of ticket office at south gate to grounds (Sakakura Associates, Inc.).
- 1979: Addition of new wing on north side of main building and construction of connecting passage way to main building (Mayekawa Associates, Architects and Engineer).
- 1984: Ticket window added at south gate to grounds (Sakakura Associates, Inc.).
- 1997: Removal of auditorium, administrative office building, and ticket window, construction of special exhibition room beneath forecourt, and addition of special exhibition wing on west side of Main Building. Forecourt finishing and two staircases in forecourt removed due to base isolation beneath forecourt, and later restored (Mayekawa Associates, Architects and Engineer).
- 1998: Base isolation work on sculptures (The Gates of Hell) in forecourt (NMWA).
- 1999: Plants planted around sculptures in southwest corner of forecourt (NMWA).

Seismic Retrofitting for the Main Building

Due to regular advancements in seismology and earthquake engineering, seismic design codes for buildings are continuously under revision; in particular, the level of earthquake resistance required for buildings was significantly increased in 1981. As a consequence of these changes, the seismic performance of buildings constructed after 1981 has greatly improved, but there were unsettled concerns that some seismically unsafe structures existed amongst those built before that time.



04 Le Corbusier, National Museum of Western Art, Tokyo, Japan, 1959. Main building. © NMWA, 1959.



05 Le Corbusier, National Museum of Western Art, Tokyo, Japan, 1959. Main building. © NMWA, 1959.



06 Le Corbusier, National Museum of Western Art, Tokyo, Japan, 1959. Seismic Isolation Retrofit © NMWA, 2007.



07 Le Corbusier, National Museum of Western Art, Tokyo, Japan, 1959. Main building. © NMWA, 1959.

Little progress was made through these efforts; however, since a majority of buildings damaged in the Great Hanshin/Awaji Earthquake Disaster of January 1995 were observed to be those built before 1981, consequently, in 1995, measures to seismically upgrade all structures built prior to 1981 were swiftly adopted including the legislative enactment of related policies, such as the Act for Promotion of Seismic Retrofit of Buildings by the Ministry of Land, Infrastructure, Transport.

Under such circumstances, an evaluation of seismic capacity was conducted for the NMWA that had been built in 1959, and although the building satisfied Seismic design codes at the time of its construction, it was determined that it would suffer substantial damage in the event of a strong earthquake. In addition to a regular attendance by crowds of visitors and its storage of the museum's valuable collection, it is a work of architecture by world-renowned master architect Le Corbusier; thus, it was critical to secure earthquake safety without further delay.

Toward this objective, the NMWA renovation committee was established in July 1995. Through this committee, the architectural value of the museum was examined, and determining that, as it is representative of Le Corbusier's museum archi-

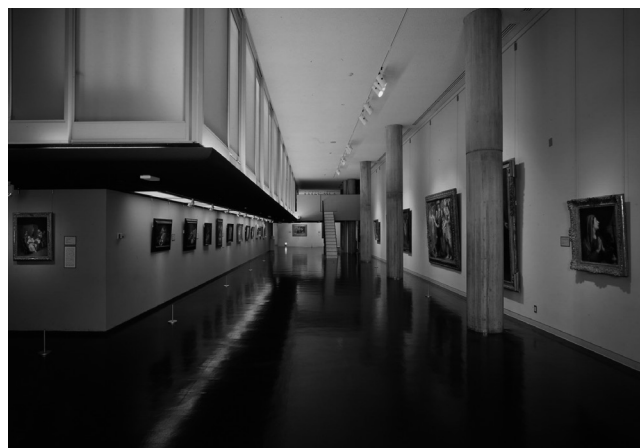
tecture, and is the sole work of the modern maestro in Japan, we should investigate methods for seismic strengthening that would best preserve the original architecture, both on the exterior and interior.

The most conventional means of strengthening for this type of structure is through increasing the amount of earthquake resistant walls and/or enlarging its columns and beams to enhance its seismic capacity. A number of schemes employing these methods were examined for this building; however, while each of these proposals would have ensured earthquake resistance, they would have produced an ungraceful effect on the original structure with visually undesirable alterations or additions.

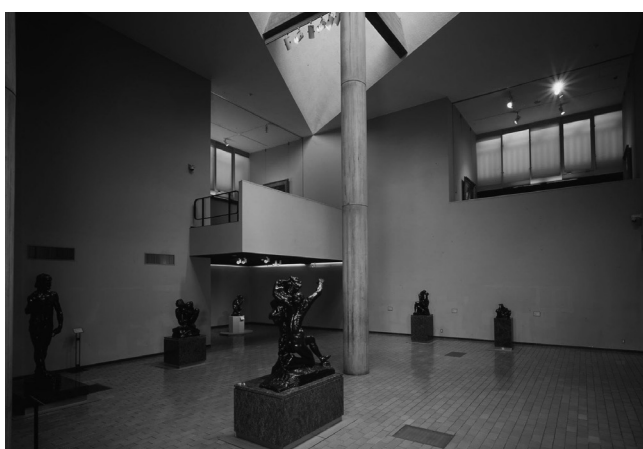
As shown in the above and also Table 2, the NMWA has never extended like an idea of a prototype "Museum of Unlimited Expansion (MUE)" by Le Corbusier. Architects who took charge of extensions of the NMWA, such as Junzo Sakkura and Kunio Mayekawa, couldn't change the original state, because the main building is regarded as a monument of Le Corbusier. ■



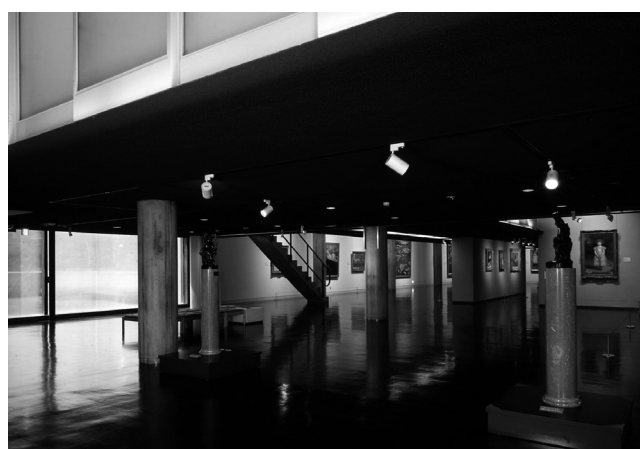
08 Le Corbusier, National Museum of Western Art, Tokyo, Japan, 1959.
© NMWA, 2007.



09 Le Corbusier, National Museum of Western Art, Tokyo, Japan, 1959.
© NMWA, 2007.



10 Le Corbusier, National Museum of Western Art, Tokyo, Japan, 1959.
© NMWA, 2007.



11 Le Corbusier, National Museum of Western Art, Tokyo, Japan, 1959.
© NMWA, 2007.

Notes

- 1 Akiko Mabuchi, Introduction for "Preservation and Utilization Plan for the Main Building of the National Museum of Western Art (Important Cultural Property/Building) and the Grounds of the National Museum of Western Art" (Registered Monument/Place of Scenic Beauty), September 2013.
- 2 One column one beam one ceiling element one illumination element for the day one illumination element for the night.
- 3 Max Bill (ed.), *Le Corbusier - Oeuvre complète*: Volume 3: 1934-1938 (French, English and German Edition), Editions H. Girsberger, Zurich, Switzerland, 1939, p. 238.

References

- FUKUDA, Kyo, SHIMAZAKI, Eri, KUMAGAI, Ryouhei, YAMANA, Yoshiyuki, "A Study about the Realization of "Musee a Spirale Carree" in the National Museum of Western Art: Through the Analysis of the Design Change by the Cooperation of Atelier Le Corbusier and the Japanese Architects", 2010-07-20, p. 913-914, NAID: 110008113812.
- FUKUDA, Kyo, YAMANA, Yoshiyuki, KUMAGAI, Ryouhei, "A Study on the Facilities Renovation History of the National Museum of Western Art Main Building", 2012-09-12, p. 209-210, NAID: 110009649743.
- FUKUDA, Kyo, YAMANA, Yoshiyuki, KUMAGAI, Ryouhei, "A Study on the Archiving of the Architecture's Documents on The National Museum of Western Art", 2011-07-20, p. 875-876, NAID: 110009523542.
- KATO, Masahisa, FUKUDA, Kyo, YAMANA, Yoshiyuki, "The Historically Valuable Materials of Main Building of the National Museum of Western Art" 2011, 2011-07-20, p. 865-866, NAID: 110009523537.
- Le Corbusier and the National Museum of Western Art, Tokyo (in

commemoration of the 50th Anniversary of the National Museum of Western Art), Tokyo, The National Museum of Western Art, 2009.

The National Museum of Western Art, Tokyo, National Museum of Art (Independent Administrative Institution), "Preservation and Utilization Plan for the Main Building of the National Museum of Western Art (Important Cultural Property/Building) and the Grounds of the National Museum of Western Art" (Registered Monument/Place of Scenic Beauty), Introduction by a director (Akiko Mabuchi) is included. September 2013.

YAMANA, Yoshiyuki, "The National Museum of Western Art as a Prototype for a Museum of Unlimited Growth", in Ana Tostões, Jong Soung Kimm and Tae-Woo Kim (ed.), *Proceedings of the 13th docomomo International Conference Seoul - Expansion & Conflict*, docomomo Korea, 2014, p. 24-27.

Yoshiyuki Yamana

(b. Tokyo, 1971). Architecte DPLG., PhD on Art History. Professor at Tokyo University of Science. Head curator of National Archives of Modern Architecture/Japan. Visiting Fellow of National Museum of Western Art. Vice President of docomomo Japan. International Expert committee Member of the project of "Architectural Work of Le Corbusier — An Outstanding Contribution to the Modern Movement" for UNESCO World Heritage. Japan ICOMOS National Committee Member, ICOMOS ISC20C Member.

Kyo Fukuda

(b. Tokyo, 1971). Master of Engineering, Tokyo University of Science. National Museum of Western Art Curatorial Division Assistant Researcher, 2011. National Museum of Western Art General Affairs Division Specialist (Architecture), 2014.



Capitol Complex at Chandigarh Faces Development Challenges

Le Corbusier's vision for the Capitol Complex as the crown of Chandigarh city nestled in the backdrop of the Himalayas responded well to the aspirations of a modern and independent India in 1948. As recorded by several researchers of modern architecture, the Capitol Complex was strategically designed by Le Corbusier to share an intended visual transparency with its natural setting of the hills and forests in the backdrop. While Chandigarh has expanded to the south-west with the initial designed sectors now giving way to large scale housing structures on the outskirts, the original sectors and the Capitol Complex have, to a large extent, retained their authenticity well in terms of form, colour, location and setting.

However, the physical and administrative juxtaposition of Chandigarh with the two adjoining states of Punjab and Haryana have recently resulted in a land parcel that seems to allow controversial development projects such as the contested Tata Camelot Housing near Sukhna Lake just beyond the Capitol Complex. This multi-storied housing project, that was conceived in 2006 near the Sukhna

Lake on a land piece owned by the Punjab Government, is being contested by Chandigarh's residents and the Forest Department through the judicial court to save the city's green areas and its modern legacy. Even though the project was given an initial clearance by the environment department of the Punjab State government, there was strong resistance from Chandigarh residents who filed a writ petition in 2013 against the project in the judicial court. In October 2013, the Supreme Court asked for the status quo with a clear directive that "even a brick should not be laid in the area", and referred the case to the Delhi High Court. The Delhi High Court is expected to hear the case on July 15, 2015. The residents and administration of Chandigarh are absolutely confident that these multi-storied towers will never be built, thus retaining the authenticity and visual integrity of the Capitol Complex which is now nominated for World Heritage as part of a serial transnational nomination in 2015.

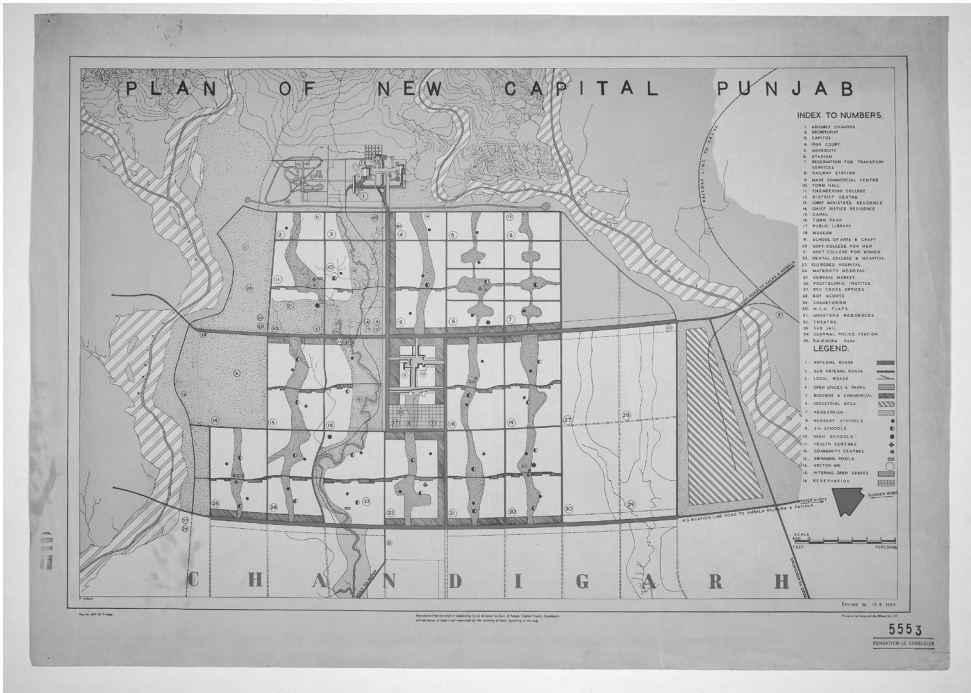
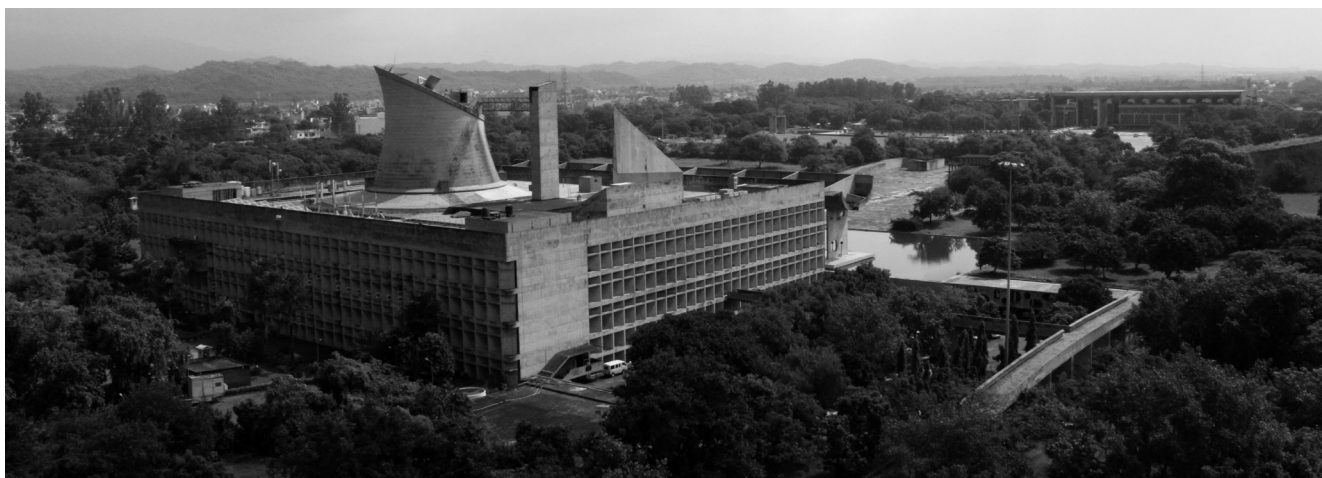
In a country like India, where cities face great pressures of social demands and urban expansion becomes a necessity, it is difficult to argue for the retention of large open rural-urban pockets vis-à-vis needs of the city. Clearly, there are diverse views that are

pitching heritage against development to justify such constructions. In the case of Chandigarh, the location of the proposed Tata Camelot Housing will be a visual eyesore from the Capitol Complex and also have a strong environmental impact as it is proposed to be built on a water catchment area near the eco-sensitive area of Sukhna Lake. Moreover, the Capitol Complex at Chandigarh, with its assemblage of the Assembly Building, the High Court and the Secretariat along with the Open Hand, is not only an internationally recognized masterpiece of modern architecture but also a national legend of independent India. This relic of 20th century architecture by Le Corbusier needs to be safeguarded in its natural setting for posterity and the will of Chandigarh residents will help in this realization. ■

Shikha Jain

Sign the petition to stop the construction of Tata Camelot Housing at

http://petitions.moveon.org/sign/save-le-corbusiers-capitol?source=c.em.cp&rb_y=12525062



04 Le Corbusier, Plan of New Capital Punjab, Chandigarh, India, 1950-1965. © FLC/SPA, 1953.

On Collective Form

BY FUMIHIKO MAKI

The following article is an edited version of the keynote address presented at the *13th International docomomo Conference* that took place in Seoul, Korea, in September 2014. In this essay, Fumihiko Maki's urban design theory and practice are traced through nearly 60 years of written and built work. Extensive travel and observations of village formations (under the auspices of the Graham Foundation) in 1958, research and writing "Investigations in Collective Form" at Washington University in St. Louis, and associations with the Metabolist Group and Team X are elements which Maki has stitched together to form his understanding of urban architectural group form strategies. These strategies have been tested in a variety of projects throughout Japan and elsewhere; together with his texts, they form a continuing body of work that exhibit how successful, quality urban environments are created.

Introduction

The summer of 1958 was to prove the most memorable period of my life as an architect. I was teaching in the School of Architecture at Washington University when I received word that I had been selected as a Fellow by the Graham Foundation, which has its headquarters in Chicago. The Graham Foundation fellowship, established principally to support young artists including architects in pursuing research of their own choosing, was perhaps the most generous fellowship in the world at the time.

I decided to spend most of the following two years traveling in South-East Asia and the Middle East, regions I had not visited before, as well as Northern and Southern Europe. It was for me a journey to the West.

Of the many cities and villages I visited on two extended trips in those two years, the ones that made the greatest impression on me were communities of houses, built with walls of sun-dried brick and tiled roofs, of the kind that are scattered all along the Mediterranean in countless numbers. The sight of those houses — their features thrown into sharp relief by deep shadows — linked and piled on top of each other on the hillside under the strong sun and against the background of a deep blue sky was by itself remarkable, but what was even more striking was the fact that the community, that is, the collective form, was composed of quite simple spatial elements such as rooms arranged around a small courtyard.

At the time, architects and historians in Japan had not yet begun to undertake surveys of villages. I saw in those collective forms an expression of regional culture, that is, a body of wisdom accumulated over a period of many years.

The impressions gathered on that journey are behind the proposal entitled "Group Form" which I presented in 1960 with my friend, the architect Masato Otaka. That was a time when the development of land to the West of Shinjuku

Station, formerly occupied by a water purification plant, was starting to become a widely discussed topic. This joint proposal was intended to be not so much an actual scheme for that area as a demonstration of the idea of group form.

However, the proposal was not meant to confirm what I had discovered with respect to forms of dwelling in villages on my journey. At the time I was interested in the notion of an urban order based on a collection of elements and believed it offered an alternative to the order, based on enormous structures built on the scale of civil engineering works, that architects and utopians had been proposing since the start of the 20th century.

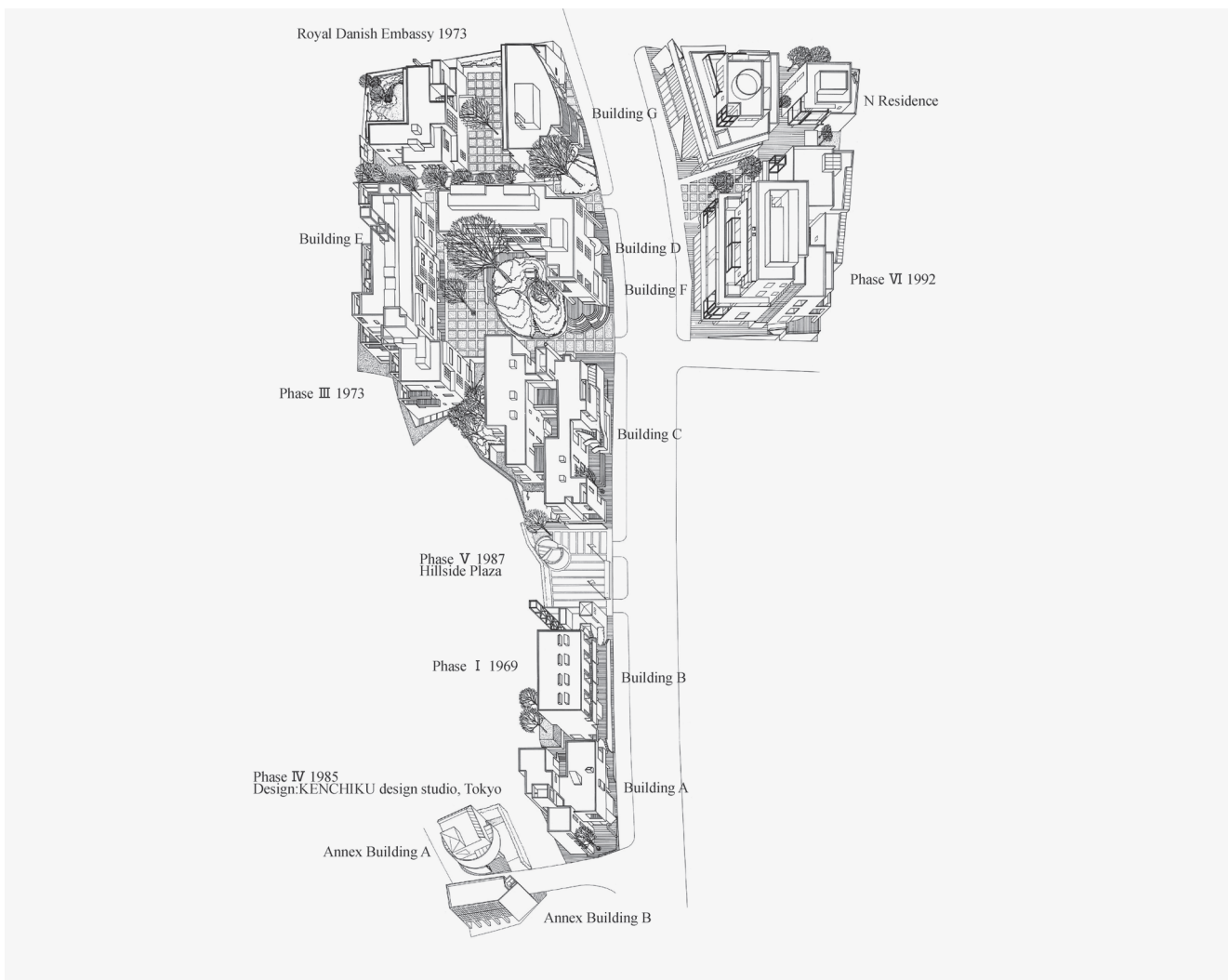
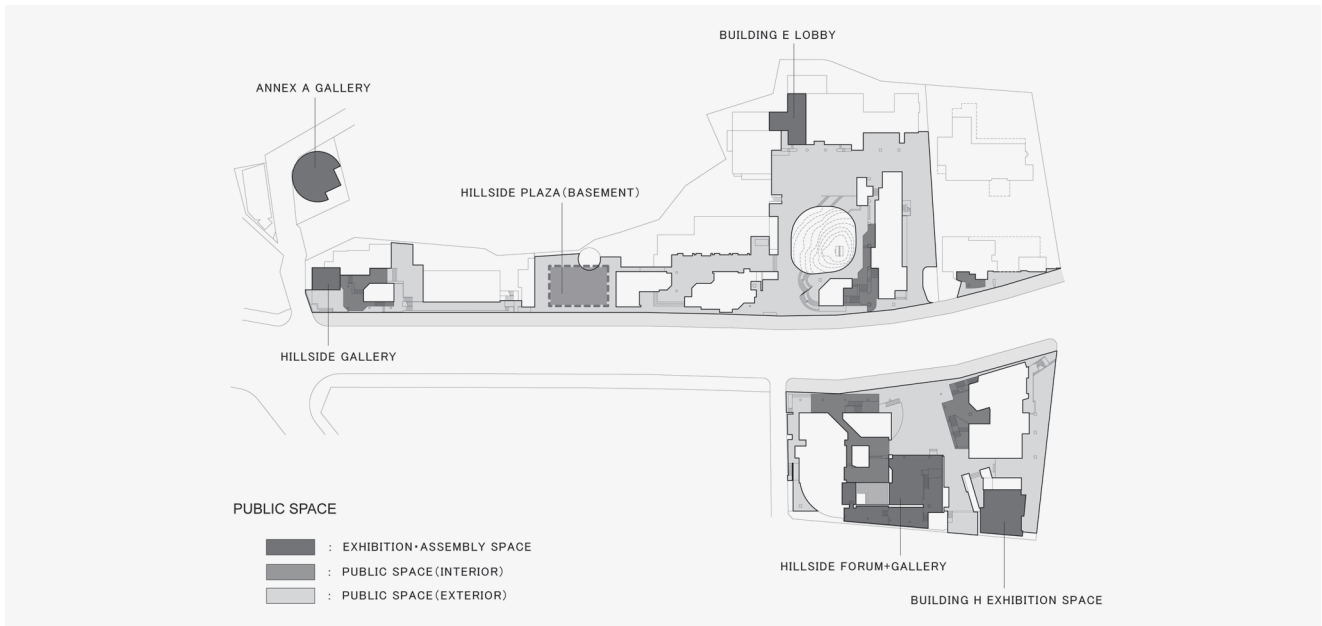
The notion of starting with individual elements to arrive at a whole was not only elaborated in the idea of collective form but subsequently became a basic theme for my own architectural aesthetic and logic.

This two-year journey was valuable in that, it gave me an intuitive knowledge of the fact that ultimately, in an organic form such as a city, the urban order can only be maintained if the autonomy of individual buildings and districts is assured.

The early 1960s were a time when the architectural world was still exploring various issues of modern architecture that had been developed before the war. At the same time, doubts were starting to be expressed about the validity of the ideas of modern architecture with respect to the city, and new investigations were being initiated. The megastructure can be seen in the context of the time as an attempt, based on a faith in technology, to expand the realm of architectural possibility.

In summer of 1960 I participated in a Team X conference in Southern France. Although members continued to take a humanistic, regionalistic approach and to reject megastructures, they were troubled by "the issue of great numbers", that is, the effectiveness of architects in dealing with the problem of housing large numbers of human beings.

- 01 Fumihiko Maki + Maki and Associates, Hillside Terrace, Tokyo, Japan, 1969 - 1992. Diagram showing various types of public spaces in the Hillside Terrace complex. © Maki and Associates.



- 02 Fumihiko Maki + Maki and Associates, Hillside Terrace, Tokyo, Japan, 1969 - 1992. Axonometric drawing of the Hillside Terrace complex showing Phases I - VI. © Maki and Associates.



03 Fumihiko Maki + Maki and Associates, Hillside Terrace, Tokyo, Japan, 1969 - 1992. Aerial view of the Hillside Terrace complex. © ASPI, n/d.



04 Fumihiko Maki + Maki and Associates, Keio University, Shonan Fujisawa Campus, Fujisawa, Japan, 1990 - 1994. Entrance façade of the Shonan Fujisawa Campus. © Toshiharu Kitajima, 1992.

In 1961 I returned to teaching at Washington University and, using notes I had previously made, I wrote over the course of a year a paper describing the three paradigms of collective form that would subsequently become the first chapter of “Investigations in Collective Form”. I still remember typing the original sheets from which mimeographs were made. I sent copies of this “underground” publication to the members of Team X, American architects and urban designers with whom I had recently become acquainted. I received an unexpectedly large number of responses. People like Walter Gropius, Kevin Lynch and Jacob Bakema took the time to send letters with their comments. One reason my paper met with such a response was that, as I have already mentioned, the early 1960s were a time when new explorations were at last being undertaken into architecture’s place in the city and the relationship between the city and architecture. In addition, my approach, which was to study the relationship between architecture and the city from the perspective of collections of buildings and quasi-buildings, was different.

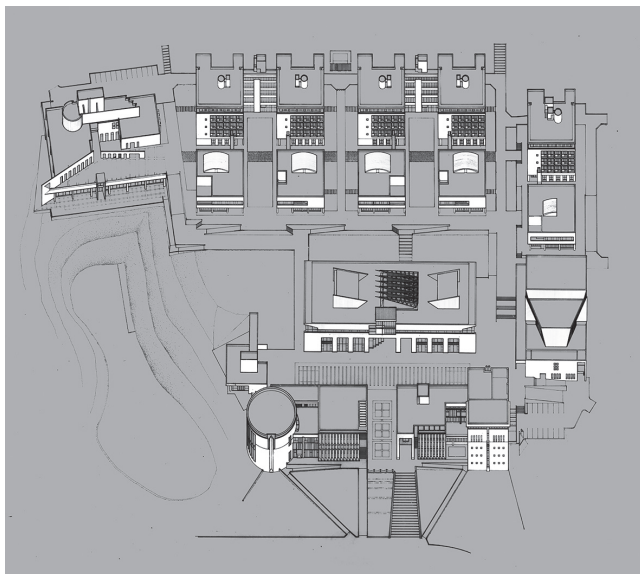
“Investigations in Collective Form” was published in 1964. The second chapter, which I wrote with Jerry Goldberg, at the time a research student at Washington University, was an essay on collections of elements from the perspective of linkage. The question of linkage is discussed on various levels. If each building, that is, each structural unit of the city, has its own lifespan, then different elements are apt to be replaced at different times. The relationship that ought to be created between elements of different ages is dealt with here as an issue of organic linkage between elements. The city thus can be seen as the sum total of countless events being generated simultaneously. When the architect or planner introduces something new under such circumstances, that act fits into certain operational categories. An attempt is made to discover the stance of the designer with respect to the city in the process and meth-

od of the particular operation. To put it another way, the historical context each individual carries with him is made apparent by such operations.

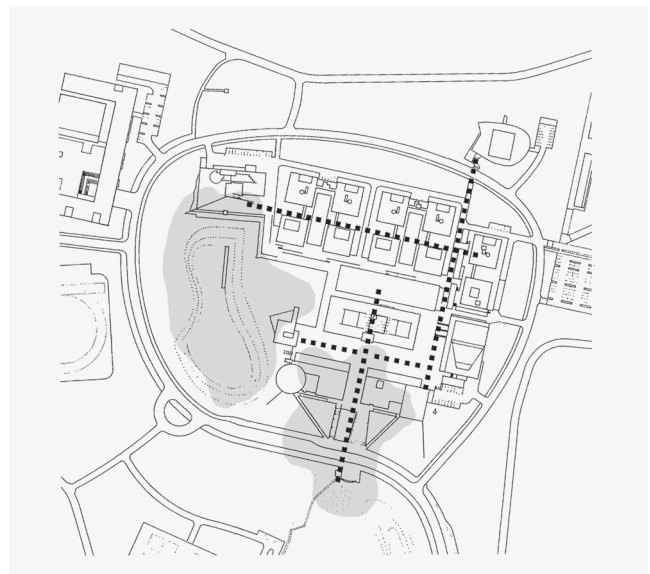
As I have already stated, such a position recognizes that the city as a physical place and social system depends on the autonomy of individual elements and seeks ways in which each individual element may participate in the whole.

The first chapter appears at first glance to present the three paradigms of collective form — “compositional form”, “group form” and “mega form” — as opposing, antagonistic patterns, but as stated at the end, the three patterns or modes are not mutually exclusive but can coexist in one configuration. They define the three basic relationships that always exist between individual elements and the whole. Lack of experience in actually designing buildings may account for an oversight. I neglected to consider the existence of space as a medium, in either collective form or linkage. It was a premise of my argument that the elements of compositional form are architecturally more self-sufficient than those of either group form or mega form, but I ought to have undertaken a more extended analysis of modes of exterior space and the interstices between elements within the composition. It was only later, in planning projects such as Hillside Terrace, Rissho University, and the Fujisawa campus of Keio University, that I gradually gained experience and learned that collective forms can depend on how such exterior spaces are created.

Through experience I also discovered a more subtle technique. By emphasizing the autonomy of individual architectural elements and deliberately creating weak linkages between them, one enables those elements to become more distinct indices of time and place. I learned that opposition and its antithesis, harmony, in fact characterize relationships on many different levels and that their cumulative effect determines our actual image of the city.



05 Fumihiko Maki + Maki and Associates, Keio University, Shonan Fujisawa Campus, Fujisawa, Japan, 1990–1994. Drawing of Keio University, Shonan Fujisawa Campus. © Maki and Associates.



06 Fumihiko Maki + Maki and Associates, Keio University, Shonan Fujisawa Campus, Fujisawa, Japan, 1990–1994. Campus master plan diagram showing the N–S and E–W axes. © Maki and Associates.

Time and Landscape: Hillside Terrace

The Hillside Terrace project took exactly 25 years, or a quarter of a century, from the first plan (in 1967) to the completion of the sixth phase (in 1992) (Figures 02 and 03). The flow of time can be gauged by the transformation of Tokyo, including the district of Daikanyama in that interval. Time is also to be measured by shifts in my own consciousness, and changes in architectural character effected from phase to phase in the project reflect the passage of time.

Public Space

The landscape of Hillside Terrace lasting for over two decades is centered on public spaces, including the sidewalk in front of the site (Figure 01). Ever since the first phase, various small public spaces have been provided. Both outdoor and indoor public spaces are made open to the outside world. It may not be appropriate in today's city to have a building open directly onto the urban environment. Here, each building is a largely self-sufficient world, opening itself only to an outdoor space that is itself cut off in part from the city. Each building affords view of others, and it is through the mutual exchange of views that a collective form comes into being. The views are limited to eye-level and have a sense of scale. There have been various public spaces in the history of cities. Spatial character usually determines what is public in the city. A metropolis can provide overwhelming spaces unavailable in small cities or villages. However, public spaces in cities do not exist just for crowds or communities. They are also places that allow people to enjoy solitude. Our urban spaces become much richer when there are many different layers of public spaces and meanings. In Japan, *niwa*, historically played a role in providing a public space in urban society, not unlike that of the plaza or square. Yet at the same time it retained a private dimension.

In a metropolis, people take strolls, just as people in the countryside go to mountains or rivers. In that way they are able to establish a special, spatial relationship between themselves and portions of the city. The extent to which streets suitable for walks and public spaces are provided can be considered an effective index in determining the quality of urbanity in a city. Sadly, the contemporary city is being gradually divested of such public character.

Such themes having to do with public character have been on my mind constantly throughout the 25 years I have worked on Hillside Terrace.

Space is not the only element at Hillside Terrace that has a public character. In the course of 25 years, programs too have been gradually developed. The owners felt strongly that the project should not be limited to commercial and residential use. For the last 10 years, various cultural events such as the annual SD Review and musical performances have been held here. The fifth-phase underground space called Hillside Plaza provided a place for such activities. In the sixth phase, a new multipurpose space was located facing the ground-level plaza. It is intended primarily for artistic exhibitions and gatherings and has a corner where refreshments are served. The space is like the first floor area in SPIRAL where various informal events are held.

I have enjoyed creating this unusual combination. In summary, Hillside Terrace not only marks a period of my own life but is my homage to Tokyo of the late Showa and early Heisei eras.

Campus in a Pastoral Setting

Periphery and Center

Keio University decided to establish a new campus centered around two new faculties as well as middle and high schools in the Shonan district of Fujisawa City, approx-

imately 30 kilometers from Tokyo. There are at present about 4,000 undergraduates and 200 graduate students. One of the main objectives of this university is to develop a new approach to education adapted to the growth of information and communication industries in recent years. This campus was constructed in four stages beginning in 1990 and was completed in 1994 (Figure 05).

A campus in a pastoral setting is a special educational environment. Here, I would like to re-examine how we went about creating that environment, beginning with the preparation of the master plan. The project offers a case study in the development of a collective form.

The 30-hectare site is in a hilly area typical of the western part of the Tokyo Metropolitan Region. There are a number of gently sloping hills on the site. Beautiful evergreens still grow here and there around the site, but within the project area the land was largely covered with *susuki* (Japanese pampas grass) and undergrowth. On clear days Mt. Fuji is visible beyond the woods on top of the hill to the west. The topography gave us relatively little to go by, so we decided to begin by forming two domains: a center and a periphery. This was a way of giving the collection of buildings an identity. At the same time, this enabled the campus to merge with the surrounding pastoral environment in a natural way. We began by building a loop road, thus dividing the site into a central domain within the loop and a peripheral domain without. There are two gates to the campus, one at the northern end and the other at the southern, and by connecting the approaches from those gates to the loop road a network for pedestrian and vehicular circulation was created.

Another important step we took was to carefully plot the loop road, taking into account differences in ground level and geographical features, so that the land within the loop would be visibly higher than the rest of the site.

Layering of Axes and Spaces

Within the loop are arranged the classroom, research and administration facilities that form the core of the campus. The loop measures 250 meters east to west and 330 meters north to south. Approximately a third of this enclosed area was occupied by an existing pond and woods on the south side. It was decided to locate the facilities on the remaining two-thirds, thus preserving the trees and the pond. We decided to divide the whole into small domains of equal size by creating a number of approaches along east-west and north-south axes (Figure 06). This master plan was also a response to a request by the university that the facilities be dispersed like houses in a village as much as possible. By siting buildings along north-south and east-west axes, we were able to create exterior spaces that are each different in character, scale and view. The individual architectural spaces were adapted to these exterior spaces.

The campus has a "face". So do individual buildings. It is the face that determines the identity of both the campus and individual buildings. When people perceive the face of a building in the same way, that building becomes a mnemonic device for society. It was decided to create a face for

the Fujisawa campus at that point where, having passed through the front gate and climbed a gently sloping road, one comes to the hill (Figure 04).

Another distinctive exterior space is the axial space created by the cluster of research and classroom buildings that extends north to south. At the south end of this exterior space is the terrace on top of the student center. Beyond the terrace is a tall stair tower of the middle and high schools. In the short intervals between lectures, this space becomes crowded with students and is the most heavily trafficked area on the campus.

A pastoral landscape also follows the logic of collective form at the Fujisawa campus.

Republic Polytechnic Campus Singapore

High Density Campus

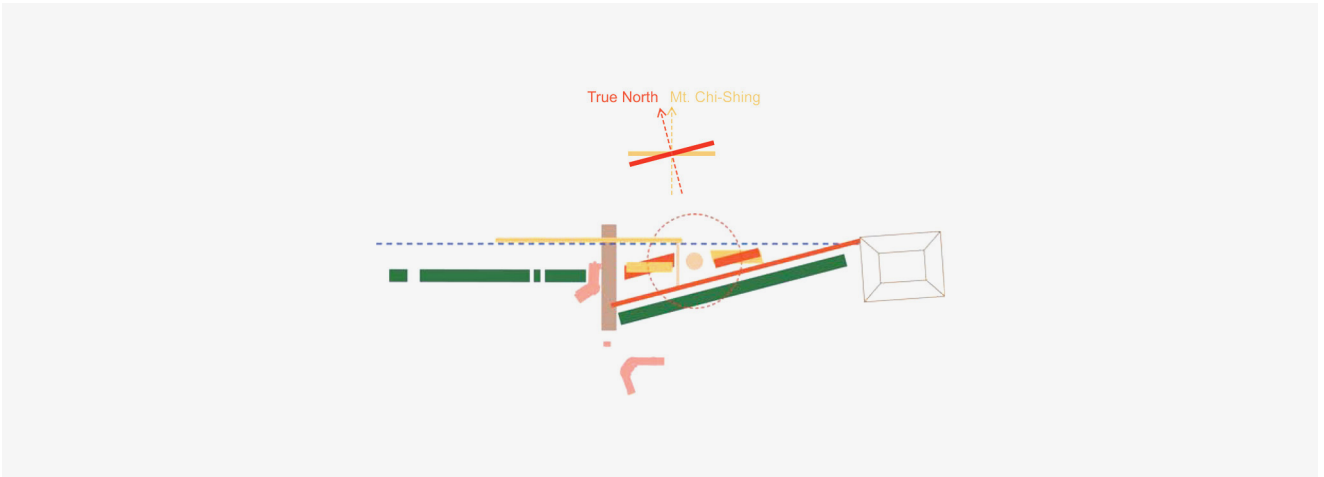
The site is located in Woodlands in the northern part of Singapore and consists of 20 hectares with a total building floor area of 240,000 m² (Figures 07 and 10). The campus services over 13,000 students and 4,000 faculty and staff members creates a relatively high density campus in a tight site. Consequently, a creative and efficient spatial strategy was devised that concentrates the main educational program within a central nucleus, termed the Learning Hub, and is surrounded by a series of satellite buildings that support the campus. The central Learning Hub consists of 11 medium rise classroom buildings, termed Learning Pods, with a large Agora space at the ground level with spaces for collective learning, including a large library, research labs, lecture halls, food courts, and other gathering spaces. Innovative spatial planning allowed sufficient open space to be preserved for outdoor courtyards, which enriches the entire campus with natural lighting and ventilation and provides extensive views.

Green Campus in a Tropical Region

Once occupied by an old British prison camp, the site of the new Republic Polytechnic is located on a gently sloping terrain and surrounded by a Regional Park and dense forest. The new campus preserves the green qualities of the original site and is integrated into the existing topography while also introducing new landscape elements that contrast with the natural wilderness. The existing slope of the site is maintained through a series of terracing ground floor levels with a sloping roof that is covered by a vast green space, termed the Lawn. Sunken courtyards cut into the Lawn level creating voids in the Agora roof and bring in natural light and provide views to nature. Covered walkways connect between the various buildings on the Lawn level, providing protection from the daily showers and strong sun in Singapore.

Students spend most of their day within the Learning Hub and/or the Agora focusing on their studies. Then, as evening sets in, the Lawn transforms into a kind of oasis for gathering and for casual activities to finish off the day. The new landscape of the campus strengthens the sense of place and ties the various buildings together as a whole.

07 Fumihiko Maki + Maki and Associates, Republic Polytechnic Campus, Woodland, Singapore, 2007. Aerial view of the Republic Polytechnic Campus.
© Maki and Associates, 2007.



08 Fumihiko Maki + Maki and Associates, Taipei Main Station redevelopment, Taipei, Taiwan, under construction. Taipei Main Station redevelopment model photograph.
Top left shows the concept of the dragon and phoenix symbols. © Maki and Associates.

The Republic Polytechnic has implemented a new educational system in Singapore known as PBL— Problem Based Learning. In contrast to the traditional classroom lecture method, the new teaching style requires multiple spaces, which are referred to as Learning Pods. At the beginning of each day, the Facilitator or Instructor will present a problem that the students have to solve by the end of the day. After receiving the problem, the students will disperse individually or in groups to the various learning centers throughout the Learning Hub (library, media center, workshops, dry labs / wet labs / clean rooms, etc) in pursuit of an answer. At the end of the day, the students then return to the Learning Pods to present their solution to the given problem.

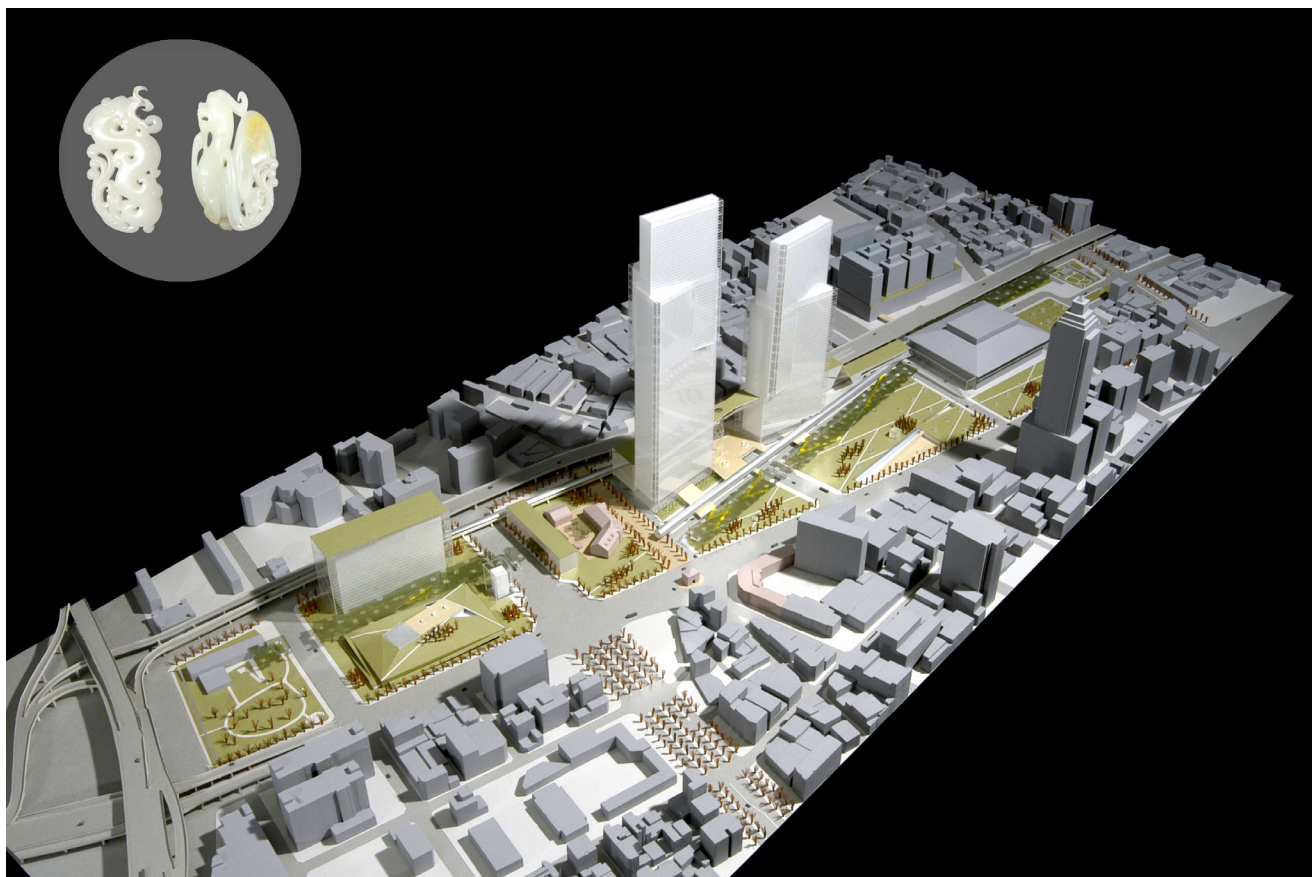
In response to this academic style, the concept of the Agora space was developed with the intentions of creating

a large mega-space to house all of the collective educational spaces together under one roof. In addition, communal spaces (food courts, student center, etc) are also interspersed within the Agora to provide places for informal study, eating, and social activities. This spatial strategy minimizes the student's travel distance and maximizes their ability to access information and conduct research.

The Development of Collective Form

In 1964, I published “Investigations in Collective Form” in which I describe and illustrate three approaches to collective form — “compositional form”, “group form”, and “mega-form”.

Some forty years later, the spatial and formal organization of the new Republic Polytechnic campus can be observed as a clear example of this concept (Figure 11). In response



09 Fumihiro Maki + Maki and Associates, Taipei Main Station redevelopment, Taipei, Taiwan, under construction. Master plan diagram showing the East-West spine and the shifting street grid axes. © Maki and Associates.

to the programmatic requirements for maximum flexibility, adaptability, and efficiency, 11 identical Learning Pods (40 meters × 40 meters) form a group of collective learning spaces whose combination or separation provide maximum flexibility (group form).

The Agora (240 meters × 160 meters) serves as a large space with a network of crisscrossing passageways that are effectively connected to the vertical movement systems of the 11 Learning Pods (mega-form).

Surrounding the central nucleus of the campus is a series of satellite buildings, including the main administration building, the cultural center, sports complex, parking garage, power plant, and staff housing. Each building takes its own unique form, but together, along with the buildings of the central Learning Hub, they are organized compositionally in relation to each other as well as to the campus as a whole (compositional form).

Taipei Main Station (TMS) Project

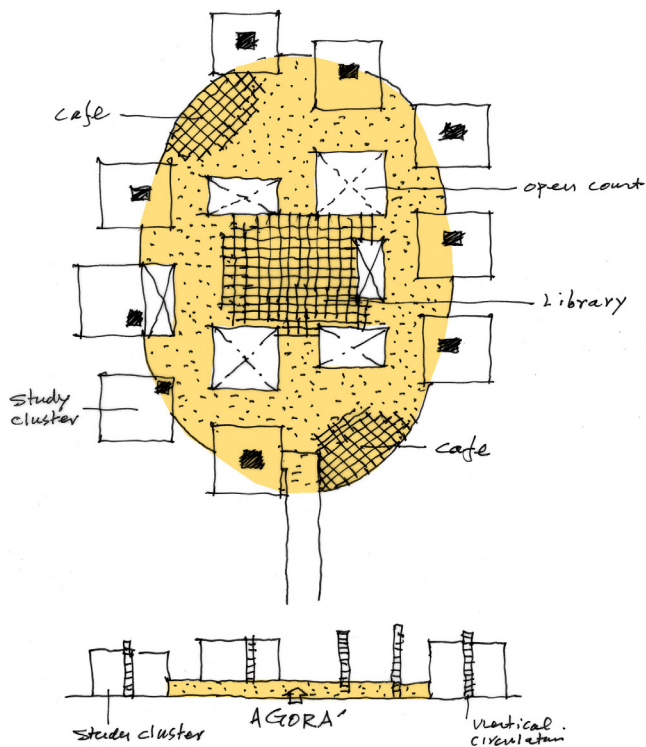
The Taipei Main Station (TMS) project site occupies an essential location in central Taipei, dotted by a number of important historical buildings and places (Figure 08). It forms part of an east-west spine that stretches from the Tansui River to Hua-Shang, and beyond to the Shing-Y sub-city center

district. The site is also situated at the junction of two shifting street grid systems. One aligns in accordance with true north, and the other derives from the position of the original city walls, which align with the axis to Mt. Chi-Shing.

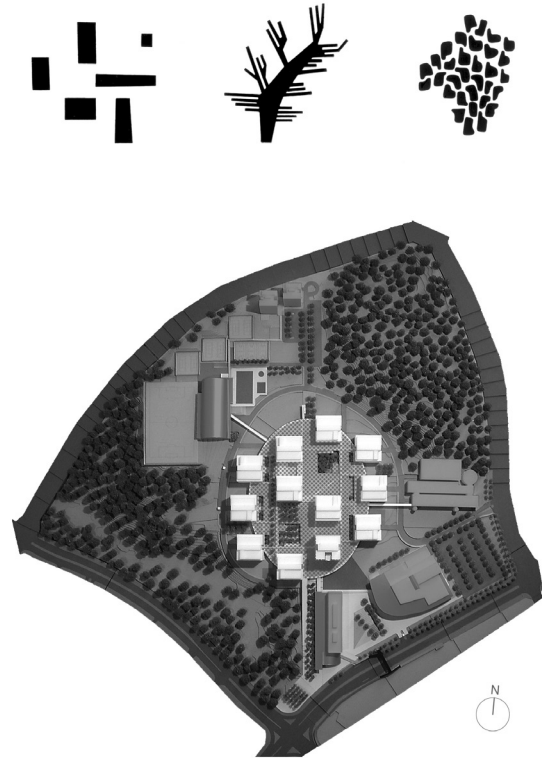
Urban Design Strategy 1: Substantiation of the Park System

Our urban design proposal re-organizes the site into five distinct districts: the Recreation Zone along the Tansui River; the Convention Zone (where we propose IT related facilities with a medium height office complex, and a half-submerged exhibition space whose surface is covered with greenery); and the Memory Zone which contains a cluster of preserved buildings as well as the new City History Museum. This zone is articulated by a long Memory Mall that concludes at the old North Gate.

The TMS Zone has also been redesigned to emphasize the continuity of green space. These green spaces and comprehensive movement systems link the five zones, each with a distinct character. This network of green space not only reinforces the city spine as a major public place in the city, but also provides a cool island that will mitigate the impact of heat from the surrounding city, particularly when new development increases the density in the area. The park system offers much needed open space in Taipei's central



10 Fumihiko Maki + Maki and Associates, Republic Polytechnic Campus, Woodland, Singapore, 2007. Campus plan diagram showing the Agora space (in orange) encompassing the various communal functions of the campus. © Maki and Associates.



11 Fumihiko Maki + Maki and Associates, Republic Polytechnic Campus, Woodland, Singapore, 2007. Top: Group form diagram - from left, group form; mega-form; compositional form. Bottom: Model photograph of campus. © Maki and Associates.

district and also provides space for both permanent and temporary art activities. 30-meter wide linear forests and the Taipei skyways, which run parallel to the linear forests, further articulate this park system.

Urban Design Strategy 2: Expression of Two Symbolic Axes
The most important urban design concept is to establish clear order for the exterior space (horizontal) and for the Gate Towers (vertical) by utilizing the two axes of true north and Mt. Chi-Shing (Figure 10). The micro-cosmos we attempted to create is a metaphor of Long-Feng (Dragon and Phoenix) a symbiotic relationship.

Urban Design Strategy 3:

The Creation of a Dynamic Landmark with the Gate Towers
The Gate Towers become prominent silhouettes in the Taipei skyline, constantly changing according to the distance and direction from which they are viewed, the weather, and the time of day. The two Gate Towers have two axes as explained in Urban Design Strategy 2 — one in accordance with the true north, and the other with the axis of Mt. Chi-Shing. The interconnected relationship between two towers symbolizes the Long-Feng metaphor. The towers also suggest the human figure — an angled head, shoulder, and

body — giving each a unique formal presence. These angled surfaces catch and reflect natural sunlight, dramatically offering ever-changing silhouettes.

Conclusion

Since the publication of the Group Form concept (in *Metabolism 1960* and later in *Investigations in Collective Form*), I have had been fortunate to realize a wide range of projects based on collective form over the last fifty years. This essay has examined four different projects — two in existing cities (a suburban area of Tokyo and a central district of Taipei) and two academic campuses (with very different physical setups, educational programs, and densities). Each project is illustrated with simple diagrams and images that outline their distinct approaches towards collective form. Just like the design of single buildings, the quality of collective form is determined by the capability and sensitivity of its architect. My conclusion is that there is no recipe that guarantees success. ■

Fumihiko Maki

(b. 1928, Tokyo). Architect (1954), University of Tokyo and Harvard University. Principal of Maki and Associates since 1965. Major projects: Hillside Terrace, SPIRAL, Makuhari Messe, MIT Media Lab, 4 WTC New York. Prizes: Wolf Prize (1988), Pritzker Prize (1993), UIA Gold Medal (1993), Prince of Wales Prize in Urban Design (1993), *Praemium Imperiale* (1999), AIA Gold Medal (2011).

Casablanca Chandigarh: Modern Planning

Exhibition at the Canadian
Centre for Architecture, Montreal

In the editorial of **docomomo** Journal 28, published in March 2003 and inaugurating her tenure — as editor-in-chief of the magazine, Maristella Casciato undertook to consider “modernism outside the West” and to encourage “new cultures and new histories”, whilst simultaneously enriching the **docomomo** International network. She brought this intellectual endeavor with her to the position as Associate Director, Research at the Canadian Centre for Architecture (CCA) in Montreal. Working alongside Tom Avermaete, she co-curated the exhibition: *How Architects, Experts, Politicians, International Agencies and Citizens Negotiate Modern Planning: Casablanca Chandigarh*, presented at CCA during the Winter 2013–2014 season. They also co-authored *Casablanca Chandigarh: A Report on Modernization*, the book published to coincide with the exhibition. A preamble to these projects lies in the CCA’s acquisition, in 2010, of architect Pierre Jeanneret’s personal archives, mainly pertaining to projects developed during the period from 1951 to 1965 when he renewed his association with his cousin, Le Corbusier, for the planning and construction of a new capital for the Indian Punjab following the Partition (1947).

Both the exhibition and the book scrutinize the history of the two cities that, in very different ways, experienced the weight of colonial rule in the 20th century: Casablanca, still under the French Protectorate, and Chandigarh, born from the ashes of the British Raj, at the end of colonization. Tom Avermaete examined French architect Michel Écochard’s plan for urban development of Morocco’s economic nerve center, which faced massive rural migration following World War 2. In 1946, the French government-appointed architect was appointed official in charge of the *Services d’Urbanisme* (urban planning) for the entire region. Maristella Casciato, meanwhile, retraced the creation of the Punjab’s new capital, whose urban and architectural planning was entrusted to Le Corbusier in December 1950 by Prime Minister, Jawaharlal Nehru.

All too often, whether in the eyes of the general public or in historical studies, big

names in architecture are given sole credit for their constructions, ignoring the fact that architecture is a collaborative endeavor. Here, both Casciato and Avermaete emphasized the teams Écochard and Le Corbusier surrounded themselves with, not only colleagues operating in metropolitan centers, but also local architects, engineers, and urban planners. Moreover, the exhibition’s curators highlighted the appreciation these designers showed for local and traditional builders.

Unwilling to leave his Paris *atelier* for an extended period, in 1951, Le Corbusier had three colleagues jointly appointed “senior architects” in residence. These were E. Maxwell Fry and Jane B. Drew, both British, in addition to his former partner, Pierre Jeanneret, who was to bear sole responsibility after the departure of Fry and Drew in 1954, until 1965. Together, the three assembled a group of twelve or so Indian professionals, each of whom was entrusted with a specific set of tasks. This strict, although not particularly hierarchical, division of labor was to take concrete shape in the plan distribution of the Architects’ Office, the Chandigarh headquarters of the ambitious Punjab Capital Project. Another singular feature of the exhibition lies in how the curators/authors situated the planning of these two cities within the new geopolitical context that emerged from World War 2. A strategic equilibrium had been redefined by the rise to power of the United States and the USSR, a situation from which a number of countries, fiercely jealous of their independence, sought to escape by forming the Non-Aligned Movement. India was one. Meanwhile, the League of Nations, that legacy of World War 1, which had failed to ensure peace in the world, was replaced in June 1945 by the United Nations (UN). The new international institution was much more than a platform for diplomacy. Many departments were created under its umbrella, including the Technical Assistance Administration (TAA), conceived to promote the economic development of newly independent nations by sending teams of experts to consult with their governments. Architects and urban planners from the North found

this context provided new, transnational opportunities to exercise their professions, and forums for the exchange of ideas.

This double transnational and disciplinary perspective structures both the book and the exhibition, albeit in different ways, as the limitations and opportunities of each medium afford. The core of the publication consists of the in-depth study of these urban projects, alternating between the two, and framed by an international perspective, both geopolitical and professional. In its pages, the planning process is examined in detail, alongside governance and the design of housing and service facilities for each of the cities as well as their deployment. The organization of the book’s content into fragmented segments makes it possible to read discontinuously. The exhibition began with a presentation of the new world order in the museum’s central gallery, which is surrounded by five other rooms, a restrictive arrangement of gallery space. However, Japanese architects *atelier* Bow-Bow successfully made creative use of the special environment in collaboration with FEED, a graphic design firm based in Montreal. Thanks to the design of ad hoc furniture, the color choices and the staging of certain exhibits, visitors could easily follow the twin threads of the exhibition, which appeared immediately in the second room of the show. Furthermore, the unusual framing of the documents showed off even the smallest and most technical objects to best effect, and harmonized the heterogeneous corpus made up of works in various sizes and media: original drawings, reproductions of blueprints, photographs, models, publications and reports. These materials were drawn from a number of archival sources, including the Fondation Le Corbusier in Paris, the Agha Khan Trust for Culture in Geneva, the gta Archives/ETH in Zurich, the School of Architecture in Rabat and the Government Museum and Art Gallery of Chandigarh.

On the walls of the central gallery, three large world maps illustrated the new transnational environment. The first of these summarized the syncopated dynamics of the decolonization that took place from 1945 to 1970. The second depicted the scope of activities conducted by international aid organizations from the Western and Soviet blocs, while the third presented the new amplitude and reach of certain urban planners and architects such as Michel Écochard, the American Jacob L. Crane, the German Otto H. Koenigsberger, Constantinos A. Doxiadis of Greece, and the British Mary Jaqueline Tyrwhitt. On a table in the center of the room, visitors



01 View of Gallery 1, "Transnational Urbanism". © Franco Panzini.



02 Le Corbusier, The Chandigarh family, © FLC/SPA, April 8, 1952.

could leaf through reports and publications from the many consulting missions in the "Third World". Through the two openings at the back of the room, visitors caught a first glimpse of two documents invested with tremendous display and historiographical value: The CIAM grids elaborated by the India and Morocco workgroups for CIAM's 9th Modern Architecture Congress (CIAM9) held in Aix-en-Provence during the summer of 1953.

These grids reveal very different approaches. The CIAM grid for Chandigarh, created by a group of young architects at the Architects' Office known as the Association of Indian Modernists (AIM), was reconstructed for the exhibition on the basis of snapshots, as the original document no longer exists. The grid adheres strictly to the format and categories established at the urging of Le Corbusier by ASCORAL, based on the Athens Charter. The grid produced by GAMMA, the Moroccan group, however, deviates from the model. It is more analytical than normative, more concrete than prospective. Photographs of the existing country and people outnumber sketches and plans. Its aim was to make sense of an anarchic built environment, the shanty towns that had sprung up in Casablanca's suburbs, and to explain the principles underlying organization of the new neighborhoods that were to replace them. This approach is a result of the methods adopted by the urban planning department, the *Services d'Urbanisme*, under the aegis of Écochard, who was

an architect, archeologist and urban planner rolled into one, attentive to the morphological, cultural, and technical dimensions of human settlements, be they antique or contemporary, monumental or haphazard. The photographs he took of both the ground and sky bear witness to his interest in local peculiarities, which a team of sociologists and ethnologists attached to the project, helped him to recognize.

The CIAM grids, striking for their large size, are each installed straddling two of the three galleries at the back of the museum space. Their narrative serves as referral into the rooms specifically dedicated to each associated city. Starting with the theme "Exploring", under which umbrella the various means used to apprehend unique site conditions were exhibited, the exhibition unfolds on to two additional themes, "Planning," and "Designing the Civic Fabric". The former offered an opportunity to get acquainted with the teams and urban development projects, whereas the latter presented specific plans for housing and facilities.

The exhibition offered a unique opportunity to appreciate, in its full-scale, the Chandigarh master plan, later reproduced in *l'Oeuvre Complète*. The plan was drawn up in Paris, shortly after Le Corbusier and Pierre Jeanneret's first stay of about two months in Chandigarh, during the winter of 1951. Several rough sketches made on-site were exhibited alongside the plan, as well as Le Corbusier's

Album Punjab (Punjab Sketch book), visible for the first time ever and complemented by a digital version. This sort of diary in the form of both writing and drawings contains observations, accounts of exchanges with administrative officials, passing thoughts and ideas. It allowed the architect to record his first impressions and trace the project's development during the first weeks of work on site. Le Corbusier, like Pierre Jeanneret, was struck by the beauty of the landscapes he encountered. Photographs taken by the latter capture the bucolic quality of the setting and rusticity of villages, lingering on scenes of daily life. The *Album Punjab* includes observations on the urban fabric of Bogota, where the concept of "sectors" was first implemented. But in Chandigarh, the plan has more green and is more organic; its conception embraces the natural landscape, a backbone following the verdant valley that cuts across the plains, and coming to a head at the Capitol Complex, designed to stand out against the foothills of the Himalayas.

Less visually compelling, but by no means less effective, the Master Plan for Casablanca also dates from 1951. A mosaic of blue prints, it depicts the old city, surrounded with the newly planned neighborhoods and their transportation infrastructure, all based on the renowned Écochard 8x8 meter grid. The grid provided both technical and functional integration, and its standardization determines both the shape of the city and that of



03 Detail of the GAMMA Grid of Casablanca. © Franco Panzini.



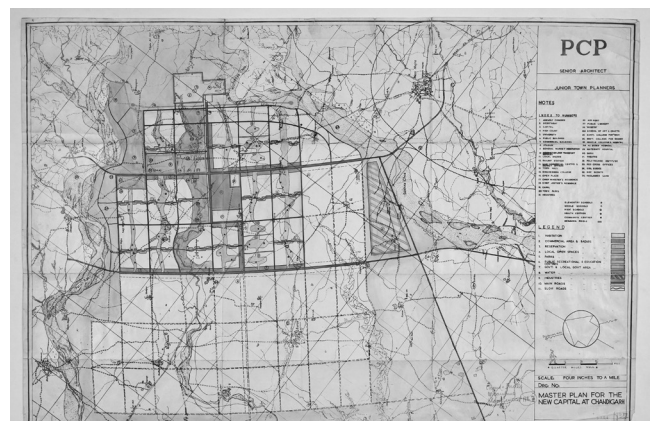
04 Detail of the Chandigarh Grid with the listing of the four key words of the Athens Charter. © Franco Panzini.



05 View of the Gallery 4, "Designing the Civic Fabric of the New Casablanca". In the centre of the room, the model of the "beehive building" in the *cité verticale* at *Carrières Centrales*, signed by Georges Candilis, Shadrach Woods and Vladimir Bodiansky. On the wall, photos by Yto Barrada. © Franco Panzini.



06 Aerial view of a neighborhood center in Casablanca, c. 1950. © Archive École Nationale d'Architecture, Robot.



07 Punjab Capital Project (PCP), Master plan for the new capital at Chandigarh after the design submitted by Le Corbusier, © FLC/SPA, April 1951



08 View of the Gallery 6, "Designing Chandigarh's Civic Fabric". In the center of the room, models of housing typologies designed by Pierre Jeanneret, Jane Drew, and Maxwell Fry. On the wall, photos by Takashi Homma. © Franco Panzini.

its buildings. The public spaces are defined by subtraction, while construction is achieved through addition, horizontal in the case of private houses, and vertical for the collective dwellings interspersed throughout the neighborhoods.

Particularly attractive exhibits include the original model for the "beehive building" in the *cit  verticale* (vertical city) at *Carri res Centrales*, signed by Georges Candilis, Shadrach Woods and Vladimir Bodiansky, and that for housing types in the *cit  verticale* at Sidi Othman, designed by Swiss architects Andr  Studer and Jean Hentsch.

Casablanca's suburbs were planned for "*le plus grand nombre*" (the greatest number), as largely similar neighborhood clusters. Chandigarh, on the other hand, carries the social hierarchy of an administrative center, and provides public facilities serving the entire state such as the university, the research hospital, and the bus station. Documentation on this aspect makes it possible to grasp for the first time in real detail the scope of Pierre Jeanneret's participation in building the city, which is much less famous than Le Corbusier's monumental contributions. To illustrate his achievement, specifically in designing residential premises, six models of various housing projects, from the home of the chief justice to the modest row houses of ordinary people, were displayed in gallery six. These models were constructed as part of a class taught at the University of Bologna in 2012.

The contemporary photographs shot on site by the French-Moroccan artist Yto Barrada in Casablanca and the Japanese photographer Takashi Homma in Chandigarh are an essential complement to both the book and the exhibition. Large-scale prints occupy one entire wall of the exhibition gallery, under the title "Designing Chandigarh's Civic Fabric". These views bring to light contrasting contemporary urban realities accentuated by the unique perspective of each artist. Homma's shots are more conventional, showcasing the architecture, its residential spaces and its details. Barrada, on the other hand, shows us an empty city, where human presence is hinted at by modifications added to the built environment. Her work shows us the ponderous public spaces with their planted beds, the facades of residential buildings in washed-out colors, rendered identical by the enclosure of their hanging courtyards and bristling with satellite dishes. She closes on the silhouette of *Carri res Centrales*, rising above the city.

As the last segment of the exhibition, these documents invited visitors to question the current cultural value of these modern neighborhoods, independent of the undeniable historical significance that Casciato and Avermaete successfully demonstrate. Preserving architectural integrity in Chandigarh, substantially altering the built environment in Casablanca, are these contrasting patterns of appropriation indicative of the success or failure of their models?

Are the differences, large or small, between these cities at completion and their contemporary shapes important to their standing as heritage sites? ■

France Vanlaethem
Chair of **docomomo** Qu bec

References

- CASCIATO, Maristella, AVERMAETE, Tom, *Casablanca Chandigarh. A Report on Modernization*, Montreal, CCA, Zurich, Park Books, 2014.
- CCA, Exhibitions: How architects, experts, politicians, international agencies and citizens negotiate modern planning: Casablanca Chandigarh, 26 November 2013 to 20 April 2014, Main galleries: <http://www.cca.qc.ca/en/exhibitions/1984-how-architects-experts-politicians-international-agencies>
- CCA, Public Programs education & events: Casablanca Chandigarh: <http://www.cca.qc.ca/en/education-events/2426-casablanca-chandigarh-public-programs>
- CCA, Research: "We're going to learn much more from Chandigarh". An interview with Rahul Mehrotra: <http://www.cca.qc.ca/en/study-centre/2325-we-re-going-to-learn-much-more-from-chandigarh>
- CCA, Collection: A first look at the Pierre Jeanneret archive: <http://www.cca.qc.ca/en/collection/1268-a-first-look-at-the-pierre-jeanneret-archive>

BOOK REVIEWS



Latin America in Construction: Architecture 1955 - 1980

Edited by Barry Bergdoll,
Carlos Eduardo Comas,
Jorge Francisco Liernur, Patricio del Real
Publisher: The Museum of Modern Art
(MoMA)
ISBN: 978-0-87070-963-0
Language: English
Year: 2015

A large-format, heavy, hard cover book with a well-known photograph by Guillermo Zamora of Enrique del Moral's Mercado de la Merced on its cover is the way the exhibition *Latin America in Construction: Architecture 1955 – 1980* gets shaped into a book. One could not expect different from the Museum of Modern Art, which is well known for having the same format catalogs with traditional design and pristine images. Next to its contemporaries (Henry Matisse; *The Cutouts, Design and Violence* and Björk), *Latin America in Construction's* physicality doesn't speak loud enough to stand out. It is a more modest, academic and introspective publication.

The catalog opens with *Portfolio* a contemporary photo-essay by the multi-published São Paulo-based architectural photographer Leonardo Finotti that separates an inch from his commercial work and captures good frames that serve as homage to the great modern photographers that are about to come to life in the next pages of the book. This editorial decision comes across as a bit strange. Why introduce a retrospective exhibition book with a photo-essay that, rather than speaking of the present, somehow mimics the technique, ambience and composition that the primary sources are about to deliver? One can start to tell, even from here, a more naïve introduction to the publication, Brazil will be pictured as one of the modern favorites.

Glenn D. Lowry in his brief but concise foreword doesn't miss mentioning MoMA's

influence in the construction of the modern architectonic discourse through the exhibitions *Latin American Architecture since 1945* (1955) and *Brazil Builds* (1943) setting the current exhibition at the same level of its predecessors, announcing the making of ongoing historiography: "An exhibition and publication that function as an ongoing laboratory for constructing new histories" (p. 15).

Barry Bergdoll's "Learning from Latin America: Public Space, Housing and Landscape" excels by far the other texts in the book. His last exhibition inside the institution had to amalgamate his academic DNA with the precise coordinating skills that require the heavy machinery of professional research teams in more than ten countries in Latin America. It is a grand-finale that sets the bar high in terms of ambition, inventiveness and an important conjuncture in a period that can unite nations under one nostalgic sense of progress and equality (later depicted as faux hopes of developmentalism, struggle and regime). It also gives us the answer we are all curious about: why 1955? Why 1980? Although the latter is not properly answered, starting in 1955 was a strategy to consider not only the first results being built, but rather them being debated. Stepping aside from the turmoil of conservatism and entering the conversation completely aware of the critique was a means to critique the critique too. Bergdoll has a couple of statements that make clear his conclusions i.e. "Latin America as the new sources of not only forms, but attitudes" a diplomatic strategy when one has to amalgamate a complete history of modern architecture in so many different nations and conditions. His text is an intense and rich journey from economic models, to political processes and even the evolution of technique making the reading interesting, not only to scholars of the topic, but to a general audience that can relate to a rapid-growth period that shaped most of the cities we live in. Leaving value judgments aside, Bergdoll manages to speak on a broad spectrum that provokes new readings when weaving all the pieces and examples together. Although loose ends remain towards a present day history and the void between 1980 to 2015, it seems like that can be a story for another exhibition, and another conceptual discourse.

After the curator's introduction, comes a loud voice that plants itself like a life-lesson. "For better or for worse, Brazilian Modern Architecture has a story of its own, and it's a long one", writes Carlos Eduardo Comas professional scholar of the discipline. Brazil was a modern beast, and it was fed by two schools:

The *Carioca* School and the *Paulista* School. Comas, guest curator to the exhibition, writes about the similarities and differences of the two groups of architects and planners that shaped Brazil into its modern suit. He intelligently analyzes them through architectural elements and purposes that lets the text disseminate and weave both schools inside the concepts. Foundation, rule, continuity, divergence, balance and extension are the methods to evolution within the time-frame of the life span of the modern architects and their buildings.

The last individual essay is by Jorge Francisco Liernur, also guest curator, who addresses a more contextual piece of writing. He searches for a correlation between architecture and new general conditions of modernization. He worries and disseminates on the city as the platform where architecture is planted and embodies deeper and greater problems that shape progress, critically concluding and thoroughly ambushing the utopian ideas of modernity with the rise of capitalism's pragmatism. Idea is dead.

Plates is the section of the book that can better translate the physical panorama of the exhibition to the support the editorial intent. It reincarnates a modern-day-editorial-World Fair where pages serve as pavilions to showcase the power of construction and how architecture shaped progress, cities and regions. The authors of the different plates are part of the modern research network, **docomomo's** usual suspects, great academic eminences from each country depicted in the exhibition that have devoted their lives to the study of modern architecture. In each one's own style, but tracing a common structure to context the illustrations, the authors set fly to a general state-of-the-art panorama on the characteristics of each nation that make them so special. Ordered alphabetically, Argentina heads the plates also chronologically, one of the few nations that showcases its historicist architecture, fruit of the European heritage in the region, a cosmopolitan Buenos Aires that shows glamour and economic progress in a more traditional and aesthetic way. The illustrations, although a very impressive gathering of material, lack "traditional" qualities looked for in modern material. The quality of the opening photograph of Ruth Verde Zein's *Brazil*, for example, differs a mile from the Argentinian imagery. Brazil is represented with by-the-book modern history, opens with *Brazil Builds*, stating just how important the nation is in this piece of research. The chapter shows a cohesive notion of modernism with its glorified giants like the Pilot Plan for



03-04 BERGDOLL, Barry, "Learning from Latin America: Public Space, Housing, and Landscape", in *Latin America in Construction: Architecture 1955-1980*, New York, MoMa, 2015.



05-06 COMAS, Carlos Eduardo, "The Poetics of Development: Notes on Two Brazilian Schools", in *Latin America in Construction: Architecture 1955-1980*, New York, MoMa, 2015.

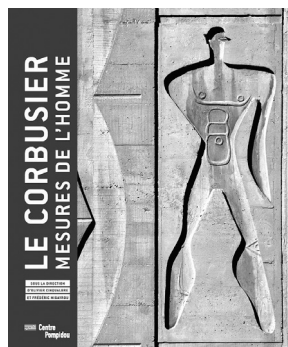
Brasilia by Lucio Costa (1957). Both schools are depicted in the panorama, referencing the previous essay by Carlos Eduardo Comas. Brazil is a brutal architecture of power and diplomacy that can only be compared to the number of spreads given to Mexico. Even though these two countries have a parallel emancipating progress in architecture, Mexico shows a completely different panorama than Brazil. Louise Noelle managed to showcase a broader spectrum of typologies, styles and experimentations showing how imbricate and autochthonous Mexican culture is and how strongly it is engaged with architecture. From State projects, to housing projects, skyscrapers, immigration, poetic Barragan, the cover picture by Guillermo Zamora, the 1968 Olympics and even stretching the research to experimental Agustín Hernández, the illustrations and their text paint an effervescent panorama of the country. The Caribbean region sadly misses out important research developed by scholars in the region including Gustavo Luis Moré and Alex Martínez Suárez. It would've been interesting to see this tropical smaller, but very valuable modernity, juxtaposing with the rest of the nations. It is difficult to detail all the research in the Plates section, and also unfair to do it isolated from the exhibition.

Authors: Argentina — Silvio Plotquín, Brazil — Ruth Verde Zein, Caribbean — Barry Bergdoll, Chile — Fernando Pérez Oyarzún, Colombia — Carlos Niño Murcia, Cuba — Eduardo Luis Rodríguez, México - Louise Noelle, Peru — Sharif Kahatt and Jean Pierre Crousse, Uruguay — Gustavo Scheps, Venezuela — Silvia Hernández de Lasala.

Alas the book ends with an authored bibliography that has a digital component to keep building the repository of research. Along with the boldness and value of the statement of putting together all these pieces of history, the project *Latin America in Construction* has a few, but very, contemporary intentions. The authored bibliography and the digital networked platform #archimoma keeps the contemporary discourse of a cutting-edge institution like the MoMA continuing.

The catalogue is, without a doubt, an important publication in recent architectural historiography and is a titanic effort that rarely could have been done without the powerful machinery of MoMA. It becomes a key bibliography in a new history of readings and is the stepping-stone towards constructing a more integral umbrella when studying Latin American modern architecture.

María García Holley



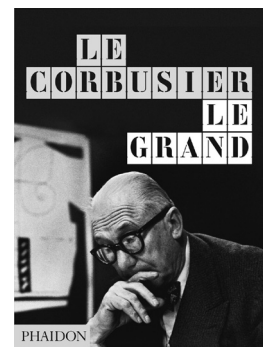
Le Corbusier. Mesures de L' Homme

Coordinated by Olivier Cinqualbre
and Frédéric Migayrou
Publisher: Centre Pompidou
ISBN: EAN: 9782844266996
Language: French
Year: 2015

Commemorating the fiftieth anniversary of Le Corbusier's death, the exhibition organized at the Centre Pompidou invites to a reread of his work through the prism of the humane figure, not only in its physicality, but also in the perceptive and spiritual dimensions. Conceived in 1943, the *Modulor* influences a whole generation of architects. Even though, such a reflexion about an essential and universal measure — “the series Man”, thinker and perceiver — is at the hearth of the multifaceted work of Le Corbusier, to date, there was no publication to apprehend such fundamental notions about the architect's work.

Expanded by the contributions of young researchers, the catalogue presents the Corbusean course in the light of this theme, from the Jurassic origins until the last days along the Mediterranean. It highlights the ubiquity of the human in its production, from elements of the painted works, achievements or architectural projects, furniture and writings, which testify/reflect the richness and complexity of his thought.

Translated publisher's notes.



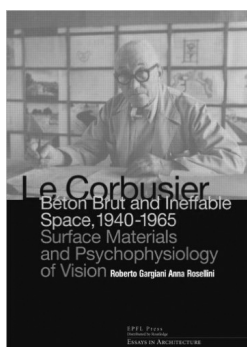
Le Corbusier Le Grand

Edited by Jean-Louis Cohen
and Tim Benton
Publisher: Phaidon
ISBN: 978-0-714-84668-2
Language: English
Year: 2008

Drawing on an array of archival material, including sketches, photographs, and correspondences, *Le Corbusier Le Grand* depicts in roughly chronological order not only the vast and varied output of Le Corbusier, but also the major events, people, and forces that shaped the life of an artist who continues to fascinate those in and outside the architectural world.

Le Corbusier (1887–1965) is one of the giants of twentieth-century architecture and design. Born Charles Edouard Jeanneret in La Chaux-de-Fonds, Switzerland, the self-named Le Corbusier was not only the creator of some of the most important and impressive buildings of the last century—Villa Savoye at Poissy, the Chapel of Notre Dame du Haut at Ronchamp, the Parliament Building in Chandigarh, India—he was also an accomplished painter, sculptor, furniture designer, urbanist, and author. His work and social theories continue to be a dominant force in the world of architecture and design, while his elegant bearing, typified by his round black eyeglasses, which are still today a signature look for architects around the world, helped cast him as an heroic figure out of Ayn Rand's novel *The Fountainhead*.

From the Publisher.



**Le Corbusier: Béton Brut
and Ineffable Space (1940 – 1965):
Surface Materials
and Psychophysiology of Vision
(Essays in Architecture)**

Edited by Roberto Gargiani
and Anna Rosellini
Publisher: EPFL Press
ISBN: 978-0-4156-8171-1
Language: English
Year: 2011

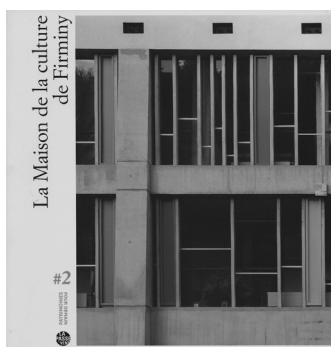
Béton brut and ineffable space: two concepts defined by Le Corbusier after World War II that speak about a stronger dialogue between materials and artistic vision of his work. Invented to designate his own particular use of exposed concrete, *béton brut* is analysed from different perspectives: its fabrication with a rigorous selection of its constituent materials; its textural imprint obtained by a refined assembly of formwork; and the treatment of its surface with special types of paint.

In the synthesis of his artistic vision, ineffable space is explained in all its forms and meanings, from the insertion of the tapestries and paint in the qualification of the spaces, to the way in which photography is used to study the unexpressed potentialities of architecture and painting.

The genesis of Le Corbusier's work, the quality of constructions materials and questions of optics, artistic vision and the psychophysiology of perception are analysed in relationship with the contemporary artistic phenomena such as the automatisms of Breton, the Art Brut of Dubuffet, the Concrete Music of Varèse, Klein's research on monochromes, Pop Art and the concept of transfer.

In this essay, a new vision is revealed about the last and fundamental works of Le Corbusier.

From the Publisher.



La Maison de la Culture de Firminy

Edited by Gilles Ragot, Sophie Omère,
Jean-Marie Refflé, Franck Sénant
and Michel Kneubühler
Publisher: Éditions la Passe du Vent
ISBN: 978-2-84562-230-2
Language: French
Year: 2013

At the end of 1966, the journal *L'Architecture d'Aujourd'hui* devoted a special issue to cultural buildings. The part devoted to French cultural centers was introduced by extracts from a report by Emile Biasini¹. The report concerned both the result of the first cultural centers open to the public and a prediction for the next phase of construction. The text clearly emphasized the program's flexibility as a main goal, which implied the awareness of the unpredictability of uses and architectural implications: "which activities to expect in a house of culture. The answer is all of them, even those that are not yet invented. If it is difficult to imagine the latter, you must hunt down all the constraints that architecture can impose on the course of a cultural activity (...). These technical requirements need to be solved taking into account not only the present but also the future"². In this journal issue, released only a year after Le Corbusier's death, the Firminy Cultural Center, recently completed, evidently functioned as a model, even if it was not a cultural center according to the definition of the leading cultural policy program launched by the Secretary of State of André Malraux in 1959.

The book *La Maison de la Culture de Firminy* is the second issue in a collection entitled *Patrimoines pour Demain*, which aims to inform the wider public about a restored building. So this is the ambition of this richly illustrated book, with several contributions and essays by Gilles Ragot, Sophie Omère and Michel Kneubühler.

Upon his election in 1953, the Mayor of Firminy, Eugène Claudius Petit, began to work on a new urban plan by calling former employees of the reconstruction department, to create the new district of Firminy Vert, on hilly terrain on the south of the old city. The

civic center of Firminy Vert was a commission to Le Corbusier in 1955 with a program consisting of a church, a stadium, a swimming pool and a "house of culture and youth". The first civic center is the product of a troubled genesis. A first project combined the cultural center with the stadium stands (1956–1958). The complex profile resulting from this dual function a single-slope roof and inclined facade over the playing field that protected the stadium stands. The second project presented in July 1958 was based on the separation of the two facilities, whilst keeping some essential characteristics from the original proposal. Even if Le Corbusier designed an open-air theatre and a "miracle box" to help ensure good theatrical performances, the program of the Firminy Cultural Center is that of a large youth center. A plan with a relatively narrow width (18 meters) and considerable length (112 meters) make the building function as a linear promenade punctuated by double-height activity spaces where it is necessary. The structural system of the roof, which is composed by autoclaved cellular concrete (ACC) boards and tensioned cables as well as the articulation of three floor levels with the topography, makes this building totally different from other cultural centers based on compact solutions. The 16 bays punctuated by wavy ceiling boards confirm the direct link to the *La Tourette* convent in which Iannis Xenakis had developed these harmonic timber partitions. Le Corbusier visited the site on the 21st of May 1965, and died in the same year before construction was fully completed. André Wogenscky finished the construction and Pierre Guariche designed the interiors and a large part of the furniture. The cultural center was inaugurated on the 15th October 1966.

Gilles Ragot essay "*Firminy Toute une Histoire*" evokes the friendly and intellectual ties that linked Eugène Claudius Petit, Minister of Reconstruction and Town Planning (MRU), to the architect Le Corbusier. He then describes the genesis of the Firminy urban project, conceived as an illustration of the *Athens Charter* principles, and the role of Firminy Youth House in the context of the Firminy Vert ensemble composed of housing, cultural and sports venues. In a precise and documented narrative, the author insists on the programmatic hesitations that would make the Firminy House something more than a youth center and something less than a house of culture, including the attention paid to the topography and landscape, the origin of certain technical decisions such as the roof or the vicissitudes of construction (1961–1969) detected in the archives. Sophie Omère considers the study of Firminy furniture as a significant testimony of 1950's and 1960's design. The design of specific furniture for working spaces and for the shows, as well as the provision of

furniture was ensured by Pierre Guariche in the period between 1966 and 1969, although it continued without him in the following period 1969–1972. The analysis of lighting fixtures that would probably require further studies or the furniture restoration are featured as captioned pictures. Jean-François Gange-Chavan, in an interview, reminds us that architects in charge of historical monuments are generalists but nonetheless highlights some peculiarities of the restoration and of the preservation of the “building’s identity”. Michel Kneubühler returns to the programmatic hesitations and what they disclose of French cultural policy: the houses of culture after 1959, the legacy of the People’s houses and the tensions between culture and popular education. The reproduction of a personal note from Eugene Claudius Petit, “*Éléments de Réflexions sur la Maison de la Culture de Firminy*” clarifies precisely the point of view of the main stakeholder, from the project management point of view, on hesitations, temptations to organize human activities, and attempts to reconcile popular education and cultural policy.

The book does not focus too much on the dark years of the House of Culture that became sadly known for neglect and property loss in the late 1980s. Thus the text quickly jumps from genesis to restoration and the recent process to make this house a key element of a heritage ensemble. The absence of some bibliographical sources and notable references about Houses of Culture as well as the sequence of the project’s contributions — which begin with urbanism and architecture, end with cultural policies and their resulting programs, inserting furniture in the middle — may astonish the informed reader who may however take advantage of the organization by jumping from section to section, according to his or her needs or curiosities, without fear of compromising a scholarly, organized publication.

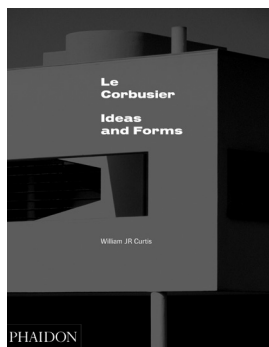
The tour guide, the last part of the book, is perhaps the one which gives us a better understanding of the building at several levels: those of the site and the urban structure as a whole, in its programmatic components, and interior design and detail. In a descriptive and educative manner, illustrated with contemporary images, this part reinforces the understanding of the turbulent history of the building but also the sequence of spaces and the Corbusean plasticity.

Richard Klein

docomomo France

Notes

- 1 “Les Maisons de la culture en France”, *L’Architecture d’Aujourd’hui*, 129, Décembre 1966 – Janvier 1967, p. 64–66.
- 2 *Idem*.



Le Corbusier Ideas and Forms

Edited by William J. R. Curtis
Publisher: Phaidon Press Limited

ISBN: 978-0-7148-6894-3

Language: English

Year: 2015

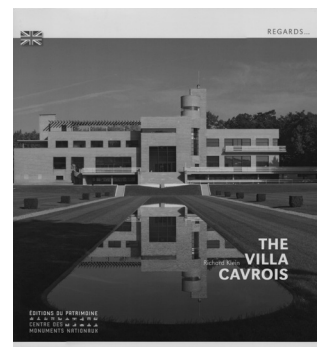
This book celebrates the genius of Le Corbusier and his oeuvre, and exposes the creative process that gave rise to his architecture. Not only a visionary architect, urban planner and theorist, but also a painter and sculptor, Le Corbusier made a thorough impact on the 20th century by dramatically changing architectural design and the way people lived in it. Today, over a quarter of a century since *Le Corbusier: Ideas and Forms* was first published, the relevance of the legacy left by Corbusier is not called into question.

This second edition preserves the structure and main core themes, although developed in the light of new knowledge, bearing in mind the temporal hiatus between the two publications. The previously existing chapters have been completed or changed in some way to accommodate a more profound analysis of buildings. The author documents individual projects in detail, contextualizing his ideals and the cultural predicaments of the time, but above all exploring the relationship between ideas and forms in Le Corbusier’s architecture: through concepts, drawings and paintings that register his train of thought. In fact, the wide range of drawings, present in the book, purport to clarify the architectural understanding of the architect, while representing highly condensed abstractions of his vision of the world. Therefore, great emphasis has been given to the visual and physical qualities of the works themselves,

Published in the year of the 50th anniversary of Le Corbusier’s death, the book aims to epitomise the genesis of Le Corbusier’s vast body of work, focusing on the physical and environmental context, by plunging into the architect’s rich universe of forms and concepts.

José Pedro Cardoso

docomomo International Collaborator



The Villa Cavrois

Edited by Richard Klein.

Publisher: Éditions du Patrimoine. Centre des Monuments Nationaux.

ISBN: 978-2-7577-0423-3 (French);

978-2-7577-0354-0 (English);

978-2-7577-0461-5 (Dutch)

Language: French, English and Dutch

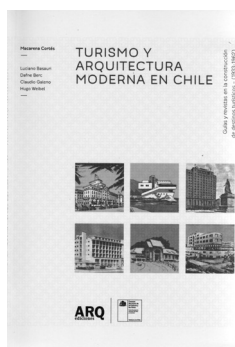
Year: 2015

A masterpiece of 20th century architecture designed by Robert Mallet-Stevens between 1929 and 1932, the Villa Cavrois had an eventful history before its restoration and opening to the public in 2015.

The man who commissioned it, Paul Cavrois, a well-established industrialist from northern France, wanted a residence large enough to house his family and servants. His meeting with Robert Mallet-Stevens was to make his project an object manifesto, an ocean liner rising on the heights of Roubaix, in a striking contrast to the neighboring traditional bourgeois houses. Mallet-Stevens mastered all aspects of the design: the silhouette and geometry of the villa: the simple, yet luxurious furniture, the material chosen specifically for each room — marble and precious woods in the reception areas and tiles in sober colors in the bathrooms and kitchen — the lighting fixtures, the heating and sound systems.

Occupied during the Second World War, sold by the heirs in the mid-1980s, abandoned and vandalized, the villa was purchased in 2001 by the French state, which decided to undertake its complete restoration. The work carried out — overseen by the *Centre des Monuments Nationaux* (Centre for National Monuments) since 2012 — had only one objective: to re-establish the villa’s original splendor. Now open to the public, the Villa Cavrois is one of Mallet-Stevens’ most beautiful creations, as well as a milestone in history of modern architecture.

Translated publisher’s notes.



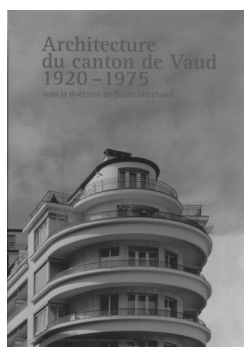
Turismo y Arquitectura Moderna en Chile
Guías y Revistas en la Construcción de Destinos Turísticos (1933–1962)

Edited by Macarena Cortés
 Publisher: Ediciones ARQ
 ISBN: 978-956-9571-02-2
 Language: Spanish
 Year: 2014

Turismo y Arquitectura Moderna en Chile. Guías y Revistas en la Construcción de Destinos Turísticos (1933–1962) by Macarena Cortés offers a particular look at the heritage of modern buildings that allowed Chile to become a tourist destination country from the mid-thirties. This examination is based on how these buildings were shown in publicity produced by the *Ferrocarriles del Estado de Chile* railway company that, for more than three decades, promoted tourism and knowledge of both the Chilean countryside cities.

Natural landscapes, architecture and cities are shown in the light of an aesthetic that aspired to a large audience and wanted to make them desirable “destinations”. The articles of Claudius Galen, Hugo Weibel, Luciano Basauri and Dafne Berc allow a deepening of this perspective from different points-of-view, ranging from local urban history to the consideration of international cases.

Translated publisher’s notes.



Architecture du Canton de Vaud 1920–1975

Edited by Bruno Marchand (Director) and Marielle Savoyat (Coordination).
 Publisher: PPUR. Presses polytechniques et universitaires romandes.
 ISBN: 978-2-88074-924-8
 Language: French
 Year: 2012

The Swiss Canton of Vaud has several well-known buildings such as Le Corbusier’s *Petite Maison* in Corseaux, Marc Piccard’s Bellerive baths in Lausanne, and Jean Tschumi’s Nestlé headquarters in Vevey. It also has different building complexes and less well-known architectural works, which are, nevertheless, also interesting and representative of a high quality of architecture. This book, through commentaries and illustrations, presents around 350 works, broken down by typologies, highlights the architecture of the Vaud Canton from 1920 to 1975. At the same time, it strives to raise public and professional awareness of the qualities of a heritage that is still often unrecognized and, until now, has never been the subject of such a comprehensive publication.

Translated publisher’s notes.



Cahiers Thématiques No. 12
Représentations de l’Architecture Contemporaine

Edited by Richard Klein and Éric Monin
 Publisher: Éditions de la Maison des sciences de l’homme
 ISBN: 978-2-905865-05-2
 Language: French/English
 Year: 2013

Devoted to representations of contemporary architecture, this twelfth issue of *Cahiers Thématiques* proposes a polymorphic vision of an art not restricted just to its built form. Dematerialized, architecture journeys at the whim of techniques and media. Seriously commented, scrupulously figured or released from its weight by impertinent artists, architecture gives way to new horizons that open up spontaneously in the public imagination. The building then passes to its secondary plan in favor of its media format. From the Corbusian declamations to the spontaneous impressions that cover advertising plastic bags, the contributions collected in this volume describe the field of architectural representations that ranges from the more structured discourse to more banal applications.

Translated publisher’s notes.