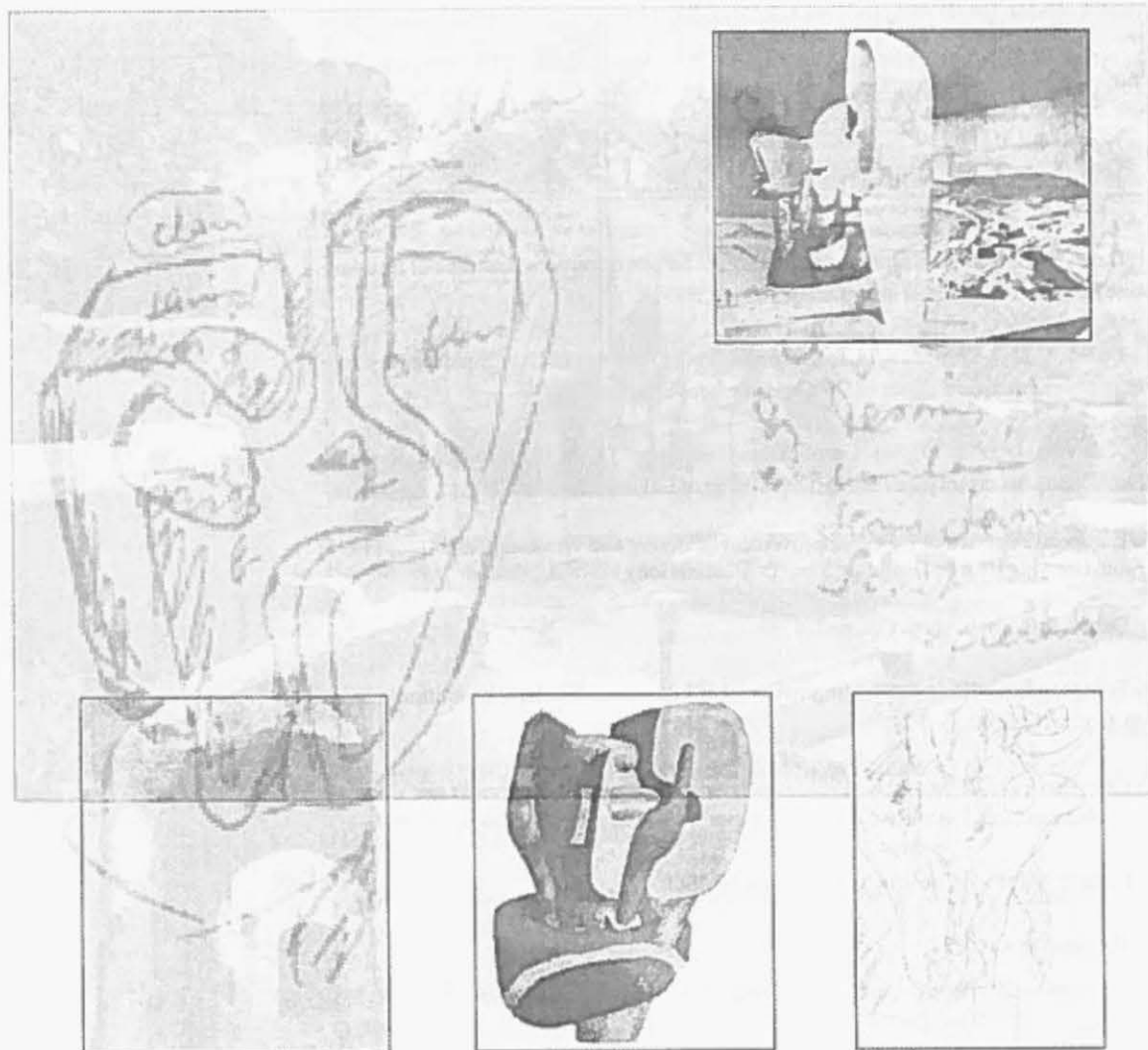


Le Corbusier's

Transformation of Travel Sketches

into architecture

in his Chapel at Ronchamp



Ming-Kang Liang

Ming-Kang Liang graduated with a BA from TamKang University in Taiwan in 1980. In 1990 he received a Master of Architecture from the University of Pennsylvania, U.S.A. He began studying for a PhD at the Department of Architecture, University of Edinburgh in 2000. His field of research is the interaction between painting and architecture, focusing on the work of Le Corbusier.

Le Corbusier's travel sketches are pictorial records of his observations and discoveries. They serve as key sources of motifs for his later work. The identification of a number of the characteristics of Le Corbusier's travel sketches will inform our understanding of how these pictorial images were reinterpreted in his later architecture. One way of reinterpretation is the transformation of elements during his sketching process. These elements were abridged, sometimes geometrised and further developed. The other is the transformation of forms and ideas from his sketches to embodiment in his architecture, either literally or metaphorically.

Le Corbusier was in a habit of carrying a small notebook (*carnet*) with him at all times, in which he jotted down thoughts and sketches. He sketched on aeroplanes and trains, in ships and hotels during his journeys. These sketchbooks turned into a diary or a record of discovery. Basically, his sketches fall into three major categories: general observations and records of things that interested him, the development of designs and drawings, and various business messages, such as the notes for construction sites. These sketches were Le Corbusier's primary working tools. After he died, 73 notebooks, dated from 1914 to 1964,¹ were found carefully numbered and arranged in an old leather suitcase in his apartment at rue Nungesser-et-Coli. Many other travel sketches and drawings were not included in this system, such as those dated in his formative years and his 'Journey to the East'. In addition to his travel sketches, drawings were created in his studio as preliminaries for developing designs and other art works.

To Le Corbusier, the sketch is a vehicle of recollection, discovery and inspiration:

'When one travels and works with visual things architecture, painting, and sculpture one uses one's eyes and draws, so as to fix deep down in one's experience what is seen. Once the impression has been recorded by the pencil, it stays for good, entered, registered, inscribed.... To draw oneself, to trace the lines, handle the volumes, organize the surface...all this means first to look, and then to observe and finally perhaps to discover...and it is then that inspiration may come.'²

Painting also functions as means to experimentation from which he developed a rich and plastic language of forms that characterize his works.³ He said: 'Through the channel of my painting I arrived at my architecture'.⁴ His travel sketches facilitated his later work and fulfilled a similar role to the *objets à réaction poétique* as a source of creativity in his studio.

During the journey, Le Corbusier 'chose to draw what struck him and what he wanted to remember most. This example (sketches of villa Adrina at Tivoli, Fig. 3.10) shows that drawing served in a real sense as a "memory" for the architecture'.⁵ Those referential and working sketches became 'a metaphorical base which may be copied, transformed, or otherwise engaged in a later composition'.⁶ These recurring memories revealed either in consciousness, such as his descriptions of a specific design, or in subconscious, to which he did not give any description, are still meaningful in his creativity.

Le Corbusier's memories were recorded in his sketchbooks categorised by places, years, travel sequences, forms, colours, and other issues that interested him. These sketches served as his personal 'pictorial library' in the form of drawing and annotation. He sometimes opened the sketchbooks; read through them and then redeveloped their contents into new creations.

Being a part of Le Corbusier's design process, 'displacement of concepts'⁷ was often employed as a vehicle of reinterpretation. This is exemplified by the transformation of an ocean liner into the Unité d'Habitation. The change in the arrangement and interpretation of existing elements found in Le Corbusier's work 'takes several forms'⁸ in the development of his new schemes.

This reinterpretation was presented not only in his architecture but also in his paintings. Sometimes the paintings were transformed into sculptures (after 1946) or architecture. The sculpture could then be applied to another element of future architecture. These three visual arts interacted and inspired one another as the process of designing *La Chapelle de Ronchamp*. Le Corbusier said:

'A life devoted to art, and especially to search after harmony, has enabled me, in my term, to observe the same phenomenon through the practice of three arts: architecture, sculpture and painting' 'the movement of time and events now unquestionably leads them toward a synthesis'.⁹

II. Some characteristics of Le Corbusier's travel sketches

Most of Le Corbusier's travel sketches in his *carnet*, in the period of 1914-1964, generally seem concise and not realistic. If one looks at Le Corbusier's earlier drawing of 'The Doge's Palace, Venice' in 1907 (Fig. 2.1), he made a beautiful, precise, detailed and realistic drawing at that time. Increasingly, his drawings became much more expressive than realistic. At the same time his design presentation drawings remained precise and accurate. There are several possible reasons for this change.

Firstly, during his formative years Le Corbusier studied many of the writings of John Ruskin and Owen Jones.¹⁰ During this period, his technique is toward "increasingly disciplined and abstract forms that eventually are controlled by an underlying unit system (circles, triangles, etc.)".¹¹ Whilst travelling, his way of recording his observations using drawings and annotations is similar to Ruskin's worksheets and notebooks.¹² After years at the Ecole d'art at La Chaux-de-Fonds, Le Corbusier started to be exposed to different cultures and he was interested in new presentations of art during his journey to the East. He was influenced by many artists such as the Impressionist Paul Signac (Fig. 2.2) in Istanbul, Cuno Amiet, Henry Matisse and Ozenfant in Paris.¹³ His drawings were then getting more free and expressive (Fig. 2.3).

Secondly, when Le Corbusier drew landscape, women and other objects, he preferred focusing on impressions, thoughts behind images and possibilities of transformation, rather than on realistic ways of representation. Following his sharp observations, Le Corbusier recorded their abridged forms in drawing, and wrote down his thoughts in text about experiences, characters, colours etc. at the same time. He usually carried out this process within a short period of time in his journey.

His vision about architecture and painting affects the way of observing and drawing.



Fig. 2.1, Details of Façade, Doges Palace, Venice, 1907, FLC2176

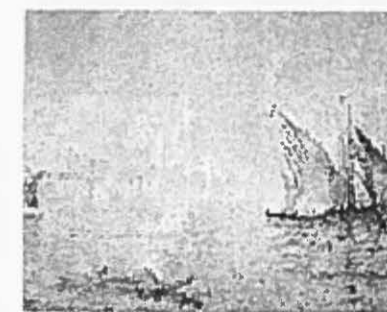


Fig. 2.2, Paul Signac, Constantinople, Izni Djani, 1909



Fig. 2.3, Charles E. Jeanneret: Seraillet set fra, Bosphorus, 1911



Fig. 2.4. Le Piquey, Spain 1932(No.487), sketchbook B8

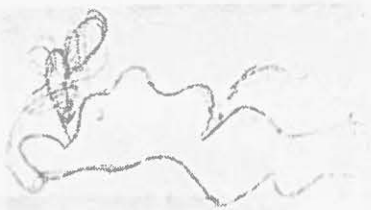


Fig. 2.5. Le Piquey, Spain 1932(No.489), sketchbook B8



Fig. 2.6. Le Piquey, Spain 1932(No.488), sketchbook B8

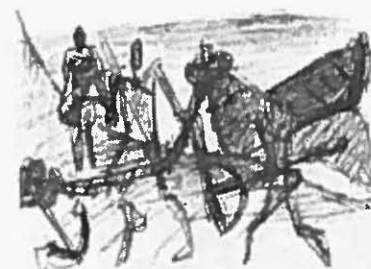


Fig. 2.7. Le Piquey, Spain 1932(No.491), sketchbook B8

To Le Corbusier, architecture is a phenomenon of the emotions. He often lived 'ineffable space, the consummation of plastic emotion'.¹⁴ Therefore to him drawing and observation is a matter of spirit, harmony or inner force:

'I would like an architect not just students to pick up a pencil and draw a plant, a leaf, the spirit of a tree, the harmony of a seashell, formations of clouds, the complex play of waves spreading out on a beach, so as to discover different expressions of an inner force. I would like their hands and minds to become passionately involved in this kind of intimate investigation.'¹⁵

Le Corbusier also warned us of the pitfalls of excessively slick drawings as he said to the students of architecture:

'I should like to give you, ... the hatred of rendering... Architecture is in space, in extent, in depth, in height: it is volumes and circulation. The sheet of paper is useful only to fix the design, to transmit it to one's client and one's contractor.'¹⁶

Transformation: to geometrize and to dissolve into background

As he looked at an object, Le Corbusier may always have thought of developing the possibilities of transforming it into new works. One way he did so is to convert things into geometric forms. For example, in his sketchbook B8, he sketched a female nude on the beach (Fig. 2.4). Two pages later, he redrew the same woman (Fig. 2.5), but this time her head was transformed into a group of winding, flowing lines harmonized with other parts of her body. In the same sketchbook, he drew and transformed a nude dissolved into a trunk (Fig. 2.6), or geometric elements (Fig. 2.7).

Orthogonal projection from an image and *mariage des contours*

Another method of transformation was to use orthogonal projection from an image of a normal object into a new three-dimensional object, such as a sketch of a foot (Fig. 2.8) shown in the same sketchbook. He projected the outline of a foot into a curved surface by means of orthogonal projection. This way of projection is meaningful in generating new and fresh three-dimensional elements from banal daily objects around us.

We may better comprehend how much potential these travel sketches provided if we look at one of Le Corbusier's drawings (Fig. 2.9). In this drawing, he made the orthogonal projections of still lifes, such as a violin, bottle and coffee pot. To him, an orthogonal projection is more orderly and purer than many of the Cubist images!¹⁷ It is also a common medium for architects to read, draw and present three-dimensional architectural objects. He juxtaposed the plans, elevations and sections of those still lifes in the same picture plane as a way of synonym (for example, the circle at the upper right-hand side of this drawing is the plan of a bottle and at the same time the plan of the pot). As seen from several orthogonal angles simultaneously, it is as if a fourth

the dimension of time, had been added and frozen to the traditional image.¹⁸

This approach to interpret plan as an elevation or section was emphasized in his writing, *Towards a New Architecture* at the same period: 'the floor...is really a horizontal wall'.¹⁹ This has been discussed further by Colin Rowe: 'If walls become floors, then sections become plans; and, as the building becomes a die to be thrown on the table, then all the rest results'.²⁰ The small die with images of multiple viewpoints in the middle bottom of this drawing (Fig. 2.9) empowered this vision.

After collage, the objects with the same outlines in common were further overlapped, or using Le Corbusier's term "married" together, which provoke greater interpretation. For example, in the above drawing, the image of the single die is composed of projections of the die from three orthogonal viewpoints and from one oblique viewpoint. Those projections are put together in a strict rectangular form. This composition may then be interpreted as: an unfolding box; a frozen image of a series of rolling dice; three separate cubes; or an L shaped figure. This "marriage"²¹ of objects provoking alternative interpretations is also seen both in the bottle with a wine glass inside, and in the phallus-like spout of the coffee pot emerging above the fluted pattern inside another wine glass the visual union suggests either that the spout is congruent with the fluted glass pattern or that the two objects have become entwined together.

Line rather than shading

One drawing technique adopted in Le Corbusier's sketches is using lines rather than shading. It was most handy for him to use a pen or pencil to swiftly catch an idea. Moreover, the architectural drawings, especially working drawings, are usually presented by precise lines instead of by shading. It is much faster and easier to use several lines to illustrate a form in a plan, elevation and perspective than to render the whole object, particularly while travelling.

Transference of previous experience

Le Corbusier's travel sketches were transformed and embodied into his architecture in various ways. One was to develop current experiences into a newly designed architectural space. In Fig. 2-11, when Le Corbusier worked on the project of Algiers, he sketched aboard on his return journey from Algiers. This sketch shows a corridor of a liner. Some of its features were adopted in the housing projects in Algiers. He annotated the drawing: *application for Algiers / floating blinds / full / 3m. / 4m / find steamship's sections for sea view data for height.*²² Being a professional architect, Le Corbusier always thought in terms of architecture and kept exploring new designs. The transformation of his travel sketches for the Chapel of Ronchamp is a good example of this process.



Fig. 2.8. sketch, Le Piquey, Spain 1932(No.495), sketchbook B8

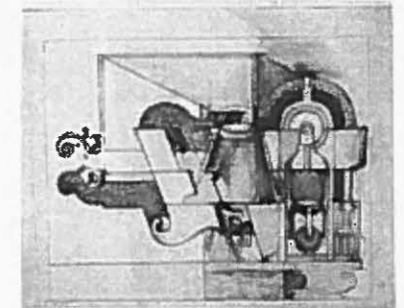


Fig. 2.9 Study of Purist still life with violin, coffee pot and bottle. 1922

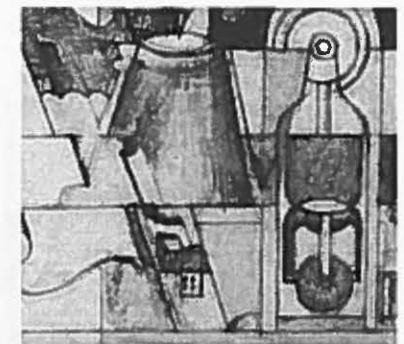


Fig. 2.10, Enlarged part of Fig 2.9 image, Study of Purist still life with violin, coffee pot and bottle. 1922

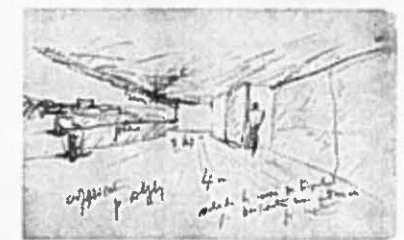


Fig. 2.11 Algiers 1933, (No.671), sketchbook C10

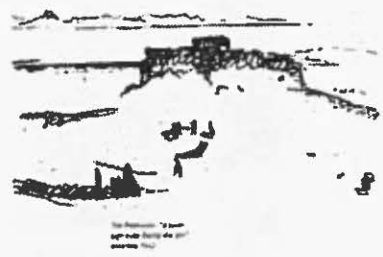


Fig. 3.1, The Parthenon, Journey to the east, Pp.211, and also in 'Towards a New Architecture'



Fig. 3.2, No.272, sketchbook D17 20-May-1950



Fig. 3.3, Site photo from south east, 'Le Corbusier 1911-1960', Pp.240



Fig. 3.4, sketch of women at Rio de Janeiro, 1936 (No.728) sketchbook C12.



Fig. 3.5, Alma Rio 36, 1949 sketchbook C12.

III. Transformation and incarnation of travel sketches applied for La Chapelle de Ronchamp

The Chapel of Ronchamp is one of Le Corbusier's most organic, powerful and mysterious projects. Several sources of design ideas can be traced from his earlier experiences, travel sketches and their developments. One point is the affinity between the high and holy places: the Parthenon, and the chapel of Ronchamp. In 1911, Le Corbusier travelled to Greece and stayed in Athens for almost three weeks.²³ He made many sketches on the Acropolis (Fig. 3.1), which to him, was a place which was 'like a repository of a sacred standard' and 'everything here is resolved in accordance with an unsurpassable formula.'²⁴ After forty years, a similar sentiment appeared in the chapel of Ronchamp. Le Corbusier saw the site of the chapel as: 'a high place in both senses: morally and physically'.²⁵

If one compares the two sketches, Fig. 3.1 and 3.2, one can see that Le Corbusier's attention focused on the top of the hill, where the temple and chapel stand out against the sky. The city below is intentionally ignored and left undefined. The temple and chapel are emphasized in both drawings. The façades of this white and high architecture are radiant, luminous, pure and especially sacred above the city scape because of their dominant location on the south side of the hill. The processional paths moving upward toward the Parthenon and the chapel have similar forms.

Le Corbusier's first sketch for the project of Ronchamp which he drew during a train journey was about the site (Fig. 3.2). A few hasty strokes outlined the mass of the hill and the existing ruin of the former chapel. He noted: 'hill larger/ church smaller/ [seen] from the Paris Basel train'. He quickly examined the relationship between the chapel and the mound. The renaissance of this chapel was initiated at that moment. If we compare a photo taken after the project was completed (Fig. 3.3) with the first sketch (Fig. 3.2), there are strong similarities. The first sketch of the site is not only a record but also an expression of initial design ideas. It even revealed parts of the final solution.

Plastique event of women at Rio, Alma Rio 36 and Ronchamp : Sketch, painting and architectural plan

Some of Le Corbusier's travel sketches were later developed into paintings and also influenced his architectural design. Fig. 3.4 is a sketch of three women drawn in Rio de Janeiro in 1936.²⁶ This sketch was again developed into several important paintings by Le Corbusier, such as *Trois figures a l'écharpe multicolore* (1937), *Deux figures, Rio* 1943 and *Alma Rio* 1949²⁷ (Fig. 3-5). *Alma Rio*, meaning 'soul of Rio de Janeiro', which hung on the wall of Le Corbusier's apartment, was apparently significant to him (Fig. 3.6). This painting, originating from a rough sketch, is full of undulating, sinuous, organic elements, and rich colour. It is 'a symphonic rhythm of outlines and an interplay of depths and heights which seems to evoke memories of rivers, peninsulas, mountain ranges and hills'.²⁸ This painting²⁹ reveals his state of mind with respect to composition and metaphor, at the time of beginning to design the chapel at Ronchamp, early in 1950.

The chapel is one of the most plastic and organic works ever designed by Le Corbusier. He described this chapel as "an acoustic plastic work".³⁰ The site of the chapel is located on a hilltop, a somewhat solitary place. Instead of a traditional symmetrical cruciform layout, Le Corbusier's sensibility toward the hilly site led him to 'begin with the acoustic of the landscape...this design is conceived with these horizons, in acceptance of them', 'they are the hosts'³² and 'an acoustic phenomenon introduced into the realm of forms'.³³ The client's programme for the chapel was quite simple; Le Corbusier was fully authorized with a "free rein to create what you will".³⁴ He generated designs in a special way: "When giving an assignment, I have a habit of committing it to memory by not allowing myself to make any sketches for several months...then, one day, a spontaneous inner impulse triggers a reaction".³⁵ Furthermore, one of his aims was to express his *plastique* passion. Le Corbusier said in 1948: 'He who deals with architecture must be an impeccable master of plastic form and a live and active connoisseur of the arts'.³⁶ This scheme therefore drove naturally toward a plastic experiment and a free form. Le Corbusier described this chapel as 'not a matter of pillars but of plastic events...they are free and innumerable'.³⁷

In such a free spirit, Le Corbusier developed this design with few restrictions. In addition, as this chapel was designed in the next year after this painting was finished, subconsciously, the architect might be still devoted to a certain specific elements of the painting he saw every day. Consequently, they were reflected in this building more than his other projects in 1950. We can relate many components in 'Alma Rio 36' to the elements of Ronchamp. For example, in the centre of the painting, the breasts suggest fecundity and spiritual nourishment. This motif is repeated in the pair of small side chapels in Ronchamp, and again in the profile of the rainspout. Even the red part in the painting is similar to the interior red wall of the side chapel. The curve on the right-hand side of 'Alma Rio 36' foreshadows the west wall of Ronchamp and perhaps, the section of the concave roof of the chapel. Furthermore, on the left-hand side of this painting, the edge of slightly curved dark blue area resembles to the east wall of the chapel. Such an interpretation of both the painting and the architectural elements is based on the projection of architectural drawings and also his previous Purist paintings.

His architectural elements are influenced by, but not limited to a particular painting. For example, a drawing dated 1931, the view of Ghardaia, M'zab in North Africa, (fig. 3.8), shows a group of buildings in an organic, plastic composition with some openings. This mosque is in a region which Le Corbusier often visited and it gave him an inspiration for the perforated south concave wall of the chapel.³⁹

Crossing forty years: Hadrian's villa and three side chapels of Ronchamp

The major source of the three side chapels with lighting towers is the top lighting system in the Serapeum at Hadrian's villa, where Le Corbusier sketched in October 1911 (Fig. 3.9, 10). At Villa Adriana (Hadrian's villa), more than seven pages of sketches were devoted to the apse end of the Canopus. He redrew these sketches



Fig. 3.6, Le Corbusier, Father Couturier (Patron of the chapel Ronchamp) and Yvonne in the apartment at rue Nungesser-et-Coli (The painting on the wall is Alma Rio)

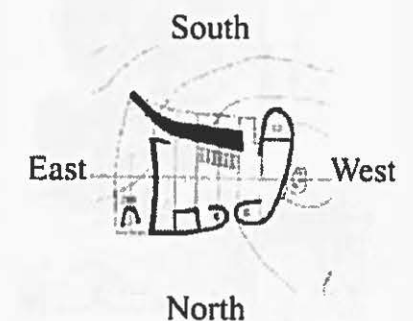


Fig. 3.7, plan of Ronchamp

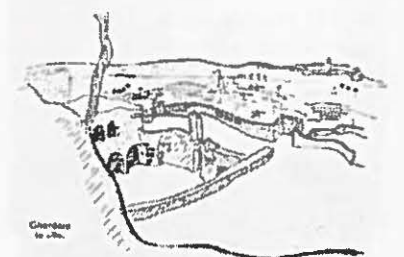


Fig. 3.8, View of Ghardaia, M'zab, North Africa, 1931 (from Plans)³⁸



Fig. 3.9, Tivoli, Hadrian's Villa, apses end of Canopus. Pencil sketch in Carnet 5, Pp. 68-69, October 1911⁴⁰



Fig. 3.10, Light effect. Tivoli, Hadrian's Villa. Pencil sketch in Carnet 5, P. 71, October 1911

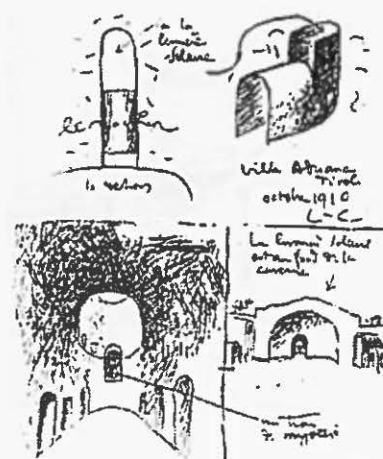


Fig. 3.11, This drawing, dated October 1910, which he redrew from the previous sketch and published as the idea-source for the chapel towers at Ronchamp.¹ *Oeuvre complete 1946-1952*, Pp.31.



Fig. 3.12, Scenic Triclinium, axial extension, interior, looking south.² Tivoli, Hadrian's Villa.



Fig. 3.13, Scenic Triclinium, interior, looking south-west.³ Tivoli, Hadrian's Villa. The excavation was carried out during 1950's.⁴

Baume as a source. Nevertheless, the date of 1910 shown on the sketches, is questionable. Later on, he transformed these sketches into the chapel towers at Ronchamp, where he combined and transformed two existing semi-circular tunnel-vaults and a half dome together into the small chapel light tower.

These two sets of drawings (Fig. 3.9, 10 and 11) gave different characters. The original one was a record drawn in pencil for the site of Hadrian's villa, annotated with "orientation (left, right, buried in a hill), darkness of the half vault, dimension of it and light quality (virtually this form and this appeal of light is beautiful)". The other drawing, dated 1910, was made later with sharp lines probably by ink for presentation. The annotation was much simpler and focussed on the sunlight (*lumière solaire*) but without any notes of measurement. Comparing the two photos of Scenic Triclinium of Hadrian's villa (Fig. 3.12,13) with that of his sketches, one can tell that in the sketches the rough texture of the ruin, the lighting from above, and the proportion of elements are all carefully observed. Another drawing (Fig. 3.14) made between 1928 and 1936 of a small country church has a rounded bell tower with a twin top opening and may also foreshadow the bell tower of Ronchamp.

Le Corbusier's sculpture also influenced the form of this lighting tower. A drawing (Fig. 3.15) relating to the sculpture "Ozon", 1947, was made in Ozon. It is a small village in the Pyrenees where there was an abandoned farm that Le Corbusier visited in 1940. The sculpture (Fig. 3.17) obviously anticipates these lighting towers (Fig. 3.18). Le Corbusier described this sculpture as a kind of acoustic sculpture; in other words, it projects its forms into the distance and in return receives the answering the pressure of the surrounding spaces. This character also echoes his description of the site of the chapel: acoustic phenomenon introduced into the realms of forms. Another drawing from sketchbook D16 (Fig. 3.16) was about the colour coding of this sculpture for J. Savina.

IV. Conclusion

Amongst all of Le Corbusier's sketches, his travel sketches are very significant to his design, as travelling was a valuable sources of inspiration for his later works. Sketching offered an important tool for observation, study and empathy via the pictorial image. His travel sketches also reveal characteristics in exploration and transformation that made them not only records but also pre-processed materials for his future designs.

The progress from a sketch to built architecture reveals how he observed, developed, and then transformed his experiences into new creations. His early observations were often used later, as with his Tivoli sketches informing Ronchamp forty years later. The exact original form was not an issue in his design process. Most elements have been transformed and reinterpreted in his new works. The transfiguration of previous experiences became a crucial and meaningful key to Le Corbusier's creativity as normally, few sketches could be fully adopted for a final work.

The sketches do not only serve as a valuable medium but also function as an idea-exploration area, and his *carnet* undoubtedly, a dwelling of his muse.

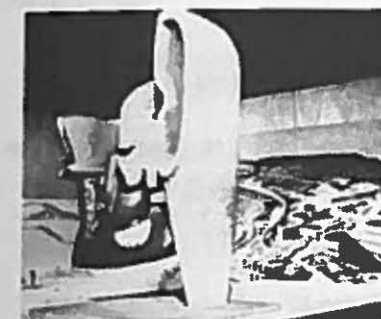


Fig. 3.17, Ozon, polychrome sculpture in wood, 1947 Joseph Savina and Le Corbusier,

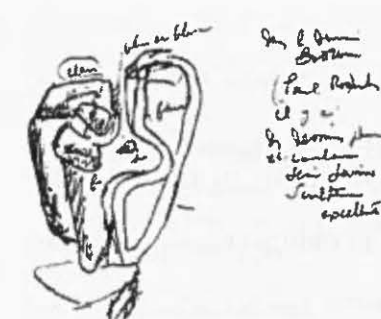


Fig. 3.16, acoustic sculpture, 1950 No. 245, sketchbook D16".



Fig. 3.15, Ozon in the Pyrenees, on an abandoned farm, 1940. This drawing relate to the sculpture Ozon, 1947

NOTES

¹ It must been about 1907, while on his earliest trip carrying a notebook but not on this group.

² LE CORBUSIER. *Le Corbusier My Work*, translated by James Palmes, London: The Architectural Press, 1960, p37.

³ ibid

⁴ *Le Corbusier, maler og arkitekt : Le Corbusier, painter and architect. Catalogue for exhibition at Nordjyllands Kunstmuseum, Aalborg, Denmark, September 30- December 10 1995*, Paris: Foundation Le Corbusier, p.6

⁵ PAULY, Daniele. *The Chapel of Ronchamp as an Example of Le Corbusier's Creative process* in Allen Brooks, *Le Corbusier: The Garland Essays*, New York: Garland Publishing, Inc., 1987, Pp. 129

⁶ GRAVES, Michael. Le Corbusier's Drawn References, in: *Le Corbusier selected drawings*, Academy Editions, 1981, p.8

⁷ COLQUHOUN, Alan. *Essays in Architectural Criticism*, MIT Press, 1985, p. 51.

⁸ ibid.

⁹ LE CORBUSIER. *New World of Space*, New York: Reynal & Hitchcock, 1948, pp.8-9

¹⁰ Jeaneret was familiar with an impressive number of Ruskin's works, see BROOKS, H. Allen. *Le Corbusier's Formative Years*, London: The University of Chicago Press, Ltd., 1997, Pp. 68.

¹¹ BROOKS, H. Allen. *Le Corbusier's Formative Years*, London: The University of Chicago Press Ltd. 1997. p. 63

¹² HEWISON, Robert. *Ruskin and Venice*, Thames and Hudson, 1978, p.54

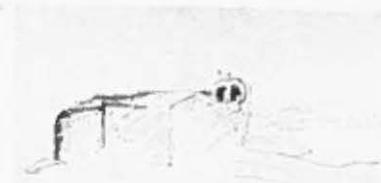


Fig. 3.14, A small country church. 1928-1936, No. 703, sketchbook C11

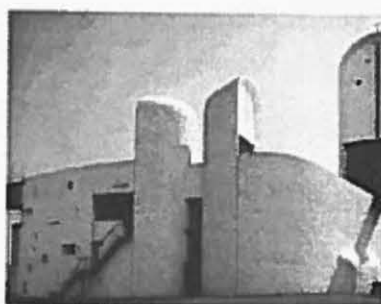


Fig. 3.18, North elevation

- ¹⁸ The ideas of a *fourth dimension* had influenced many of the avant-garde artists of Futurism, Suprematism, Cubism, and others who then challenged the old notions of space. Le Corbusier have been much inspired by the "fourth Dimension". See LE CORBUSIER. *New World of Space*, New York: Reynal & Hitchcock, 1948, p.8
- ¹⁹ LE CORBUSIER. *Towards a New Architecture*, Oxford: Architecture Press, 1989, p.186.
- ²⁰ Rowe, Colin. *The Provocative façade: frontality and contrapposto in Le Corbusier Architect of the Century*. London: Hayward Gallery, 5 March-June 1987, p.27.
- ²¹ *mariage des contours*: 'utilized a connecting arabesque of profile form "marriage of objects by the same contour in common," as they put the latter (Purist) in *La Penture moderne*.' See SOBY, James Thrail. *Le Corbusier the painter, in Le Corbusier, architect, painter, writer*. The Macmillan Company, 1948, p.118.
- ²² LE CORBUSIER. *Le Corbusier Sketchbooks Volume I, 1914-1948*, pp.27-29.
- ²³ He arrived Athens on September 12th, most of his sketch on Acropolis dated on September 1911, his sketch on Delphi is dated on Oct. 1st 1911.
- ²⁴ LE CORBUSIER. *Journey to the East*, The MIT Press, 1987, p.216
- ²⁵ PETIT, Jean. *Le Corbusier lui-meme*, Geneva: Forces Vives, Rousseau, 1970, p.184
- ²⁶ LE CORBUSIER. *Le Corbusier Sketchbooks, Volume I, 1914-1948*, sketchbook C12, No.728
- ²⁷ *ibid.* Sketch No.727 was mentioned in this introduction, but Sketch No.728 seems better fit these paintings.
- ²⁸ VON MOOS, Stanislaus. *Le Corbusier, Elements of a Synthesis*, MIT Press, 1985, p.288
- ²⁹ Between 1949 to 1950, Le Corbusier drew three major paintings: Alma Rio 36(1949), Le grand Ubu(1949) and A l'toile de mer règne l'amitié(1950). The last one presented realistically for his friends hosting a restaurant in Cap Martin, The other two are dominated mainly by a sinuous and organic composition, which is significant toward this organic architectural work 'La Chapelle de Ronchamp'
- ³⁰ File "Creation Ronchamp", FLC archives.
- ³¹ LE CORBUSIER. *Oeuvre complete 1938-1946*, Zurich: Les Editions d'Architecture, p.72.
- ³² PETIT, Jean. *texts and sketches for ronchamp* ", Association oeuvre de N.D. du Haut, Ronchamp, English Edition, 1989 (un-paginated)
- ³³ LE CORBUSIER. *Modular 2*, London: Faber and Faber Limited, 1955, English edition: 1958, p.253.
- ³⁴ PAULY, Daniele. *The Chapel at Ronchamp*, Paris: Foundation Le Corbusier, 1997, p.59
- ³⁵ GUITON, Jacques. *The ideas of Le Corbusier on Architecture and Urban Planning*, 1981, New York: George Braziller, Pp.45. This text is from the writing in the beginning of "*Textes et dessins Pour Ronchamp*", Jean Petit, 1965.
The time, "several months, is just a description of a long period of time. This project starting from the time of his first passing the site on 20/May/1950 till the first layout of plan and elevation around 9/June/1950 is around a month.
- ³⁶ LE CORBUSIER. *New World of Space*, New York: Reynal & Hitchcock, 1948, p.9
- ³⁷ LE CORBUSIER. *Modular 2*, London: Faber and Faber Limited, 1955, English edition: 1958, p.252.
- ³⁸ Stanislaus Von Moos, *Le Corbusier, Elements of a Synthesis*, MIT Press, 1985, p.140

³⁹ CURTIS, William J. *Le Corbusier: Ideas and Forms*, Phaidon Press Limited, 1986, p.180.

⁴⁰ BROOKS, H. Allen. *Le Corbusier's Formative Years*, The University of Chicago Press, 1997, p.300.

⁴¹ *Ibid.*, also see 'Texts and sketches for the ronchamp'

⁴² MACDONALD, William and PINTO, John A. *Hadrian's Villa and Its Legacy*, Yale University Press, 1995, p.114.

⁴³ *Ibid.*, p.112.

⁴⁴ Four Ionic order was not there before. See Henri Stierlin, *The Roman Empire, Volume I*, Taschen, 1996, p.165

⁴⁵ Most of the other data are in 1911, such as Daniele Pauly, *The Chapel of Ronchamp as an Example of Le Corbusier's Creative Process*, Pp.129, in: Allen Brooks, *Le Corbusier: The Garland Essays*, Garland Publishing, Inc., New York, 1987, or H. Allen Brooks, *Le Corbusier's Formative Years*, The University of Chicago Press, 1997, p.300

⁴⁶ This sketch is not dated, but the sketchbook C11 dated 1928-1936

⁴⁷ LE CORBUSIER. *New World of Space*, New York: Reynal & Hitchcock, 1948, p.108

⁴⁸ This sculpture was made in 1947. There is no clear date on this sketch, No.240. In the same carnet, several pages before, the annotating on No.240 is: 'over the years 1947-1950'; few pages after, No.254 annotated: 'Noguchi (New York) October 2, 1950 tell me that ...'. Therefore, this drawing, No.245 is very likely done in 1950. Probably there is a work of colour coding for this sculpture at this time.

⁴⁹ VON MOOS, Stanislaus. *Le Corbusier, Element of a Synthesis*, The MIT Press, 1985, p.315

⁵⁰ File "Creation Ronchamp", FLC archives, from Daniele Pauly, *The Chapel at Ronchamp*, Paris: Foundation Le Corbusier, 1997, p.110.