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Realization of the standard cabinet as "equipment" by Le Corbusier: the transformation of the "wall"

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Abstract

This paper clarifies Le Corbusier's (1887-1965) spatial composition of standard cabinets as "equipment," and it discusses the notion of "decor" in the 20th century. In his private house projects, Le Corbusier experimented with the standard cabinet as a partition separated from walls. However, he also examined cabinets incorporated into walls. Le Corbusier's realization of standard cabinets as expanded to both poles created a new notion of a "wall" and this was continued as methodology in the decorative arts.

Keywords
equipment, Le Corbusier, mobility, standard cabinet, wall

1. Introduction

This paper clarifies Le Corbusier's (1887-1965) method for making the standard cabinet "equipment" in the interior space and discusses "decoration" in the 20th century [Note 1].

In our last paper, using texts written by Le Corbusier, we analyzed the changing process of the concept of "equipment" proposed as a countermeasure against the "furniture" of the "decorative arts" [Note 2]. The notion of "equipment" by Le Corbusier has expanded over the years, and finally changed from "furniture" attached to building, to the question of a "wall" itself as the device controlling the outer, natural environment. However, Le Corbusier's general discourse was not necessarily clear. He did not explain the methodology of "equipment" for the realization of his projects.

Conversely, Le Corbusier developed houses over the years [Note 3]. Many of these projects have been carefully examined considering "equipment." If Le Corbusier merely adapted the universal theoretical notion of "equipment" derived from mass-produced housing research into a specific solution of a private house, it should have been an automatic creation process. However, his drawings show the changes in its concept and design method. That is why we can argue that Le Corbusier's "equipment" in the interior space was not an automatic application of established methodology, but instead evolved or changed over time.

Considering "equipment," Le Corbusier summarized the problems of chairs, desks, and cabinets. Among these problems, the most important architectural element was the cabinet: that is, the "standard cabinet" enabling various combinations to be produced [Note 4]. Therefore, at first, we extract Le Corbusier's discourse explaining cabinets in the context of a housing project, and derive his methodology for realizing cabinets as space [Note 5] (Chapter 2). Then, using the architectural drawings of Le Corbusier's house projects, we classify his ideal methodology for the interior space using cabinets [Note 6] (Chapter 3). Based on these analyses, we clarify the transition of his practical method (Chapter 4). Finally, we discuss the reasons for those changes and their historical meanings (Chapter 5).

Previous studies treat furniture in Le Corbusier's architectural works as peripheral things, or some mention the modernity of the furniture itself (in particular chairs, desks, or artificial lighting). Since both are based on the dualism of frame structure/furniture and do not analyze "equipment" as a component of the architectural space [Note 7]. In this paper, we examine the standard cabinet as something that can be movable and immovable, and we try to obtain new knowledge for space theory on the theme of architectural history in the 20th century.

2. The methodology of the "cabinet": its relationship with the wall

Le Corbusier directly or indirectly discussed the idea of "equipment" from 1920 to his later years; however, there are few cases in which he explained the practical methods of "equipment" in specific projects.

His initial discourse was on the "Pavillon de l'Esprit Nouveau" (1925), which was the first work to present the concept of "equipment." Le Corbusier merely briefly mentioned its installation method.

"Established in series, these standards juxtaposed in multiple combinations can be sold at the Bazaar of the Hôtel-de-Ville or Avenue des Champs-Élysées; they are put against the wall at any height, or constitute the wall" [Note 8].

According to Le Corbusier, a standard cabinet replacing a stylized cabinet can be combined in various ways, corresponding to temporal needs, and they can be installed to eliminate any waste of space. The standard cabinet can be moved in any way; in principle, the installation method should be infinite. The cabinet "against the wall" itself is certainly the most normal placement for the "furniture" of the pre-modern "decorative arts," but the standard cabinet can be floated in the air by the legs as presented in the "Pavillon de l'Esprit Nouveau."

Furthermore, according to Le Corbusier, the cabinet may be piled up from the floor to the ceiling like a wall. However, cabinets reaching the ceiling were not displayed in the "Pavillon de l'Esprit Nouveau." The photos of the interior view of this pavilion published in the *Almanac of Modern Architecture* (1926) exemplify the separation of rooms by cabinets, but they are not completely closed like walls (Figure 1). Even in the discourse of Le Corbusier, the distinction of "put[ting the cabinet] against the wall at any height" and "constitute[ing] the wall" is ambiguous.

Cabinets that reached the ceiling were displayed in an apartment at the Salon d'Automne in 1929. The main objective was


Pavillon de l'*Esprit Nouveau*. L'épine de casiers standards dans la chambre à coucher 4 penderies; 2 armoires à linge; 1 casier à chapeaux; 1 casier à chaussures; une coiffeuse.

UN SEUL CORPS DE MÉTIER

(Paru dans *Les Arts de la Maison*, Morancé, Automne 1925).

Avant le ciment armé, tous les corps de métier sur place, pour faire une maison. Après vingt ans d'application du ciment armé, on peut rêver : un seul corps de métier sur place : le maçon.

Figure 1. Cabinets of the Pavillion L'Esprit Nouveau (1925). Le Corbusier, *Almanach d'architecture moderne*, Les Éditions G. Crès et Cie, Paris, 1926, p. 109[8]

to display "cabinets," "desks," and "chairs" made of steel tubes through collaboration with the female designer, Charlotte Perriand. Le Corbusier explained the cabinets installed in the interior space, in *Precision* (1930):

"One will arrange the cabinets against the walls of his rooms, or with them will form new partitions at full height or at half height (see Pavillon de l'Esprit Nouveau, 1925); the other will build its walls by incorporating the cabinets in the masonry" [Note 9].

The method of placing cabinets is more subdivided than in the "Pavillon de l'Esprit Nouveau." Putting cabinets "against the wall" is not their only function but they can also stand against walls independently "as partition[s]." Moreover, they can "become a wall" by incorporating cabinets into walls that structurally support the building.

Thus, Le Corbusier established 3 methods of installing cabinets in the discourse concerning the following: to "incorporate" into the wall, to "put" against the wall, and to "separate" from the wall [Note 10].

However, the spatial composition of cabinets in Salon d'Automne did not exemplify all 3 approaches. Indeed, as with the "Pavilion L'Esprit Nouveau," the cabinets functioned as a partition separating the space, and the cabinets that reached the ceiling (not realized in the "Pavillon de l'Esprit Nouveau") were set along the kitchen in front and behind. These cabinets were not incorporated into the wall, and the cabinets that reached the ceiling were apparently like a wall (Figure 2).

The inconsistency between theory and practice concerning the installation method of cabinets is not only applicable to the exhibition space like the Pavilion or the Salon but also the realization project of a house. Le Corbusier explained "incorporating the cabinet into the wall" in *Precision* (1930), citing "a large book cabinet with a luxurious house" as an example (Figure 3).

The reduction in the furniture by the casiers as the wall itself on occasion can be obtained also by rudimentary methods of construction in reinforced cement:

"I draw the ceiling and the floor: I divide the height into four sectors for example, by means of three boards of reinforced concrete, a few centimeters thick, going from one wall to another or stopping at midterm. I sometimes build on one edge of my concrete planks, sometimes on the other, as needed.... Here are some beautiful wall-cabinets into which the 'interior equipment' that I have already mentioned (106)" [Note 11].

Figure 105 and 106, which Le Corbusier explained in *Precision*, was the equipment of the Palais du Centrosoyus (1929) for Moscow's Ministry of Light Industry. He did not mention the exact name of "a luxurious house" in Figure 107, but it is the Villa Church (1929). According to him, it constitutes the inner "wall" when seen from the inside space [Note 12].

However, the cabinets of Villa Church, whether or not immovable, reached the ceiling by "putting" them against the wall, as was also done in a display at Salon d'Automne. Structurally, the difference between the 2 is not obvious. Nevertheless, it is certain that the visual representation of the "incorporating" cabinets that reached both sides in Villa Church is more persuasive [Note 13].

In this way, adapting the practical knowledge of Villa Church, Le Corbusier could explain with figures 98 and 99 in *Precision*, as follows (Figure 4).

"I draw the plan and the cross-section of the new era: Windows, partition, and cabinets. I gained a considerable place; we can travel at ease; the gestures will be fast and accurate;

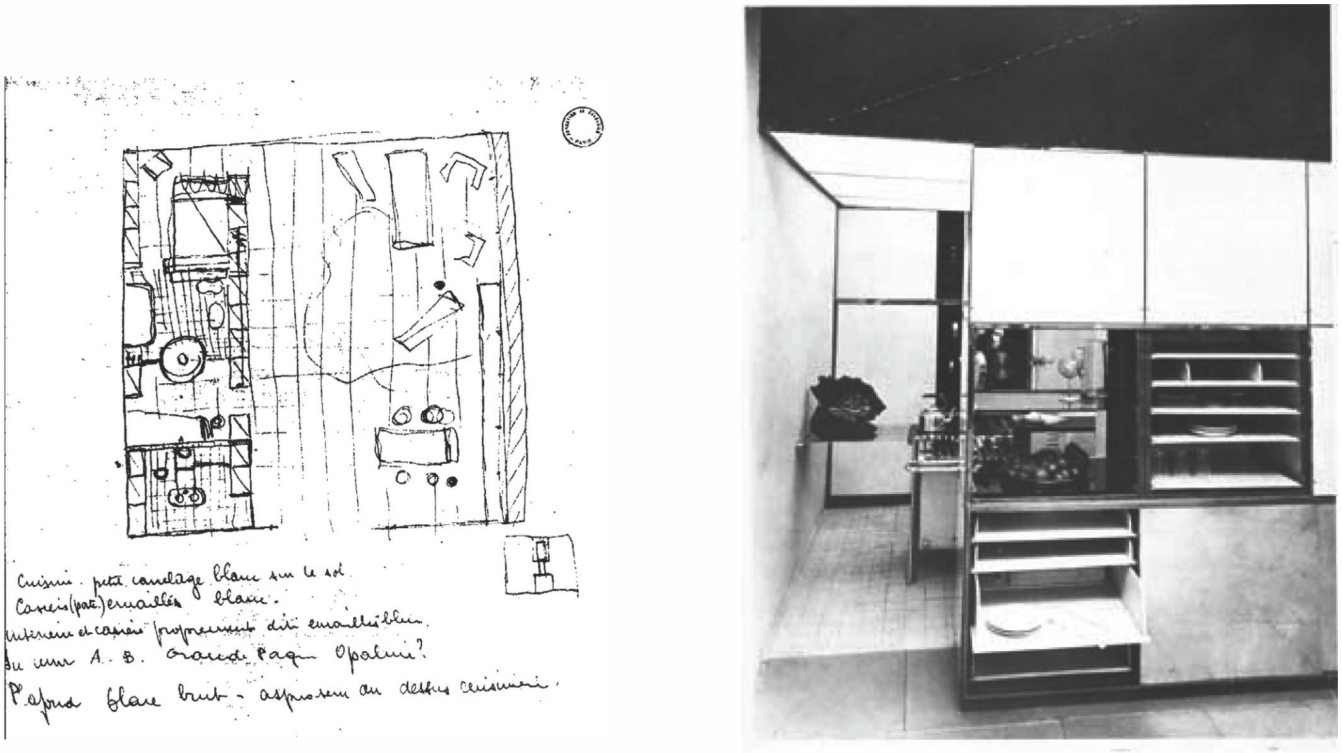


Figure 2. Sketch of the interior of Salon d'Automne (1929) by Charlotte Perriand (left) and its cabinets (right). AFLC, F1-3-78[5]; AFC, L1-20-15.[5] The cabinets that reach the ceiling like a partition before the kitchen are "separated" from the wall. They are like a wall in the back of the kitchen reaching to the ceiling and are not "incorporated" into the wall, but "put" against it

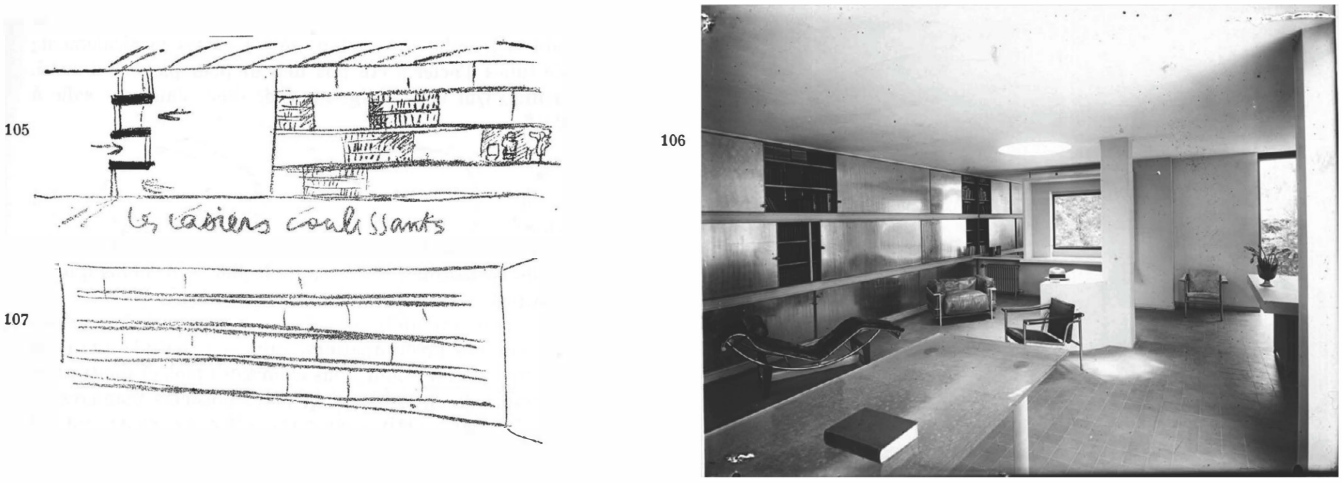


Figure 3. Sketch of the incorporated cabinets (left) and the interior of Villa Church (1929) (right) by Le Corbusier. Le Corbusier, *Précision sur un état présent de l'architecture et de l'urbanisme*, G. Crès et Cie, Paris, 1930, p. 117[10]; AFLC, Archives Villa Church[5]

automatic arrangement. *These are minutes earned each day*; precious minutes (99)" [Note 14].

The contrast between the modern reinforced concrete housing of figure 99 and the conventional masonry house of figure 98 in *Precision* is a routine presentation by Le Corbusier showing the importance of the reinforced concrete. Considering Le Corbusier's reinforced concrete houses with pillars and slabs ("Domino"), no load-bearing wall exists, and it should be impossible to set cabinets into a wall. Despite this, following his logic, a cabinet integrated with the spandrel wall under the strip window of a reinforced concrete house was "incorporated" into the wall [Note 15]. In any case, the boundary between being "incorporated" into the wall and "put" against the wall greatly depends on awareness of the "wall," the details of the installation, and so on.

We do not know whether Le Corbusier noticed this contradiction. Indeed, Le Corbusier never explained his methodological theory of cabinets as arrangements of an interior in subsequent writings.

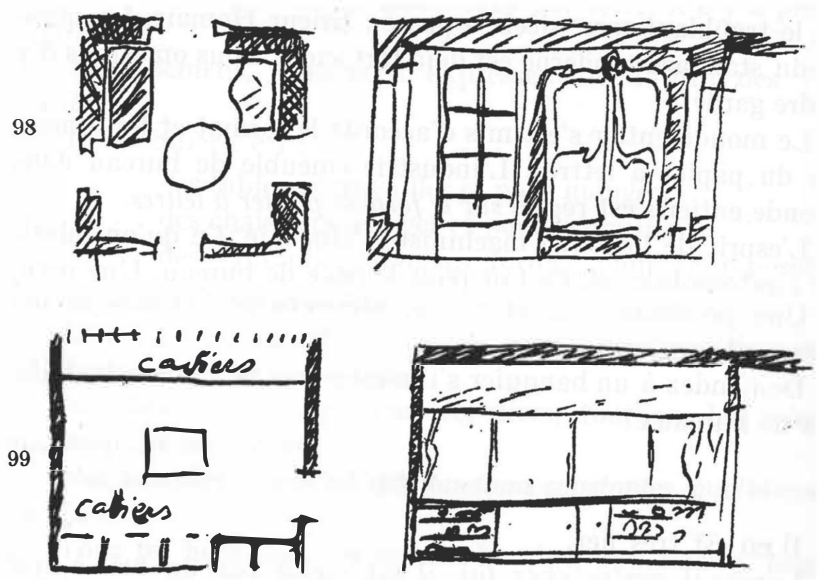


Figure 4. Sketch of the plans and the sections of a conventional house (above) and a modern house (below) by Le Corbusier. Le Corbusier, *Précision sur un état présent de l'architecture et de l'urbanisme*, G. Crès et Cie, Paris, 1930, p. 110[10]

3. Types of "cabinets" in the projects

From the discourse on the spatial composition of cabinets by Le Corbusier, the methodology can be arranged as follows in relation to the "wall":

- cabinet (dis): "separate" (disposer) from the walls: cabinet with legs floated in the air or cabinets that do not reach the ceiling (dis-1), cabinets reaching the ceiling (dis-2), and others. They function as a partition isolating an interior space independent of the structural wall.
- cabinet (app): "put" (appuyer) against the wall: cabinets hanging on the wall or that do not reach the ceiling. They isolate an interior space but partially contact the wall. They are common concerning the arrangement with "furniture" in pre-modern "decorative art" [Note 16].
- cabinet (in): "incorporate[d]" (incorporer) in the wall: theoretically integrated with the wall to make the wall an interior space (in-p); like a wall, the cabinet reaches the side wall, and the ceiling (in-a).

Based on the definition of the above 3 types, analyzing the installation of cabinets in Le Corbusier's house projects, the following transition process is obtained (Table 1).

4. The practice of "decoration"

4.1 Disorganization of the "decorative arts"

Le Corbusier began to realize a new concept of "equipment" in practice before and after a full-scale construction project in Paris in the 1920s.

Regarding the house construction and renovation projects in his home town, in La Chaux-de-Fonds (Switzerland), his clients were local businessmen, relatives, or friends. He handled all the interior decoration including various furniture, wallpaper, curtains, carpets, lighting equipment, and so on. For furniture, he even bought and chose furniture after the Louis XVI style according to client tastes [Note 17]. Concerning Villa Schwob (1916), which was first reviewed in the magazine *L'Esprit Nouveau* [Note 18], he was involved in its interior decoration after its completion [Note 19]. Contrasting modern space by the reinforced concrete structure of this villa, its furniture was placed against the wall and, considering the space arrangement, it exhibited the technique of pre-modern decorative art [Note 20], [Note 21].

Conversely, Le Corbusier conceived a modern villa in Paris, the Villa Poiret (1916), for the dress designer Paul Poiret (Figure 5). It was a reinforced concrete structure like Villa Schwob, but the interior space under the vault roof was quite different from contemporary housing concepts. Although the details are obscure because of the scant drawings, there was no pre-modern furniture. The rooms, such as the dining room, study, workplace, entertainment room, and so on, were divided by geometrical box cabinets [Note 22]. Le Corbusier defined this kind of cabinet, which became a standard cabinet, as a "light partition" [Note 23]: the cabinet was an equivalent mechanism to the partition.

A cabinet (dis-1) separated from the wall like a partition, and is independent of the structural wall, was studied later in the mass-produced houses of Maison "Citrohan" (1920) and Maison d'artiste (1922). Such an idea was also partially applied to Maison Ternisien (1923), Maison de week-end à Rambouillet (1923), and so on as private houses [Note 24].

Following the Villa Poiret project, the Villa Berque (1921) renovation project was one of the first realizations in Paris in which Le Corbusier began to collaborate with his cousin Pierre Jeannret. Consequently, fittings and furniture were attached to the existing skeletal structure. The cabinets in the interior space of this house were like the cabinets (app) put against the wall in Villa Schwob, but the height-reduced cabinets were placed perpendicularly to the wall, softly dividing the space [Note 25] (Figure 6). This method was also frequently used as an example, like the Villa "Le Lac," made for his parents (1923).

In an atelier project for an artist, the different installation of cabinets was also studied. In Maison-Atelier du peintre Ozenfant (1922) and Lipschitz's Maison (1923) for the sculptor, cabinets were necessary for their creative works [Note 26]. Le

Table 1. Private house projects and cabinets by Le Corbusier[a]

Date	Name of the private house projects in Foundation Le Corbusier	Cabinet (in)	Cabinet (app)	Cabinet (dis)
1905	Villa Fallet		*	
1907	Villa Stotzer			
1907	Villa Jacquemet			
1912	Villa Favre - Jacot			
1912	Villa Jeanneret-Perret		*	
1916	Villa au bord de la mer (Villa Paul Poiret)		*	*
1916	Villa Schwob		**	
1917	*Maison ouvrière*		*	
1920	*Maison "Citrohan"*	*		*
1921	Aménagement de la villa Berque		**	
1922	*Maison d'artiste*			*
1922	Villa Besnus			**
1922	Maison-Atelier du peintre Ozenfant	**		**
1923	*Maison Ribot*		*	*
1923	Maison de week-end, Rambouillet		*	**
1923	Maisons La Roche-Jeanneret	**	**	**
1923	Villa "Le Lac" (Petite villa au bord du Lac Leman)		**	**
1923	Maisons Lipchitz-Miestchaninoff	**	**	**
1923	Maison Ternisien	**	**	
1924	Lotissement de Lège		*	
1924	Maison Canale		**	**
1924	Maison Casa Fuerte	**	**	**
1924	Maison du Tonkin			
1924	*Pavillon de l'Esprit Nouveau*		**	**
1924	Villa Planeix		**	**
1924	Galerie-Appartement Paul Guillaume		*	
1924	Villa Marcel		*	
1925	Villa - près de Bordeaux	*	*	*
1925	Villa Meyer	*	**	**
1925	Villa Mongermon		**	**
1926	Maison Cumenge			
1926	Villa Cook		**	**
1926	Maison Guiette		**	**
1926	*Maison "Minimum"*	**		**
1926	Villa Joseph et Hanau			
1926	Villa Princesse de Polignac			
1926	Maison Atelier Dutheil			
1926	Villa Stein-de Monzie "Les terrasses"			**
1927	*Deux maisons du Weissenhof àStuttgart*			**
1927	Villa Church	**		**
1928	Villa Baizeau		**	**
1928	Villa Ocampo		**	**
1928	Villa Savoye "Les Heures Claires"		**	**
1929	Appartement de M. Charles de Beistegui	**		**
1929	Maison J. Canneel		**	**
1929	*Maisons Loucheur*			**
1929	Ma Maison, Régidence-Atelier Le Corbusier			
1929	Villa Jacquin	**	**	**
1929	Villa Mme H. de Mandrot		**	**
1929	Villa Paul Prado			
1929	Un équipement intérieur d'une habitation (Salon d'automne)	**	**	**
1930	Maison Errazuriz		**	**
1930	Villa Goldenberg			
1930	Villa Harris			
1930	Villa Martinez de Hoz			**
1931	Immeuble Porte Molitor - Rue Nungesser & Coli			**
1933	*Petite maison, CMA*			
1934	Maison de week-end (Henfel)	**	**	
1934	Villa Heng			
1935	Villa "Le Sextant", Les Mathes		**	**
1936	*Voiture "Minimum"*			
1937	Maison de week-end Jaoul			
1938	*Maisons montées à sec : G.M. MAS*			
1939	Maisons montées à sec : MAS [Maison Clark Arundell]		**	
1949	Villa du Docteur Curutchet			**
1950	Maison du Professeur Fueter	**		**
1951	Maison du gardien, Ronchamp		**	
1951	Maisons Jaoul	**	**	**
1951	Villa de Mrs Manorama Sarabhai	**		
1951	Maison pour Mr. Chinubhai Chimanbhai			**
1951	Villa (Hutheesing) Shodhan	**		**
1951	Cabanon Le Corbusier			**
1961	Pavillon d'exposition ZHLC (Centre Le Corbusier)			**

N.B. prototype house (italic); ** modification; * simple adaptation.
[a]Made by the author. This list is based on the original drawings by Le Corbusier and does not necessarily match the conditions of the cabinets in the houses. The project year of the list in this table is set as the period when the project began according to Foundation Le Corbusier's inventory.

Corbusier put cabinets against the wall and made them appear like walls (in-a) (Figure 7). The installation of cabinets for galleries in Villa Raul La Roche (1923) for a collector of modern art was the same. This room was an exhibition space for Purism paintings including Le Corbusier's, and the wall functioned as a display space [Note 27].

As mentioned, after Villa Schwob, beginning with the construction of individual houses, the different methods from the conventional installation of decorative furniture on the wall were studied fragmentarily: such as the autonomic cabinet on the wall (dis), the cabinet placed perpendicularly to the wall (app), or the cabinet which looked like a wall (in-a).

4.2 Extension of the autonomous method from the wall

In many house projects in the 1920s and 1930s, where various conditions (requirements of the owner, site conditions,

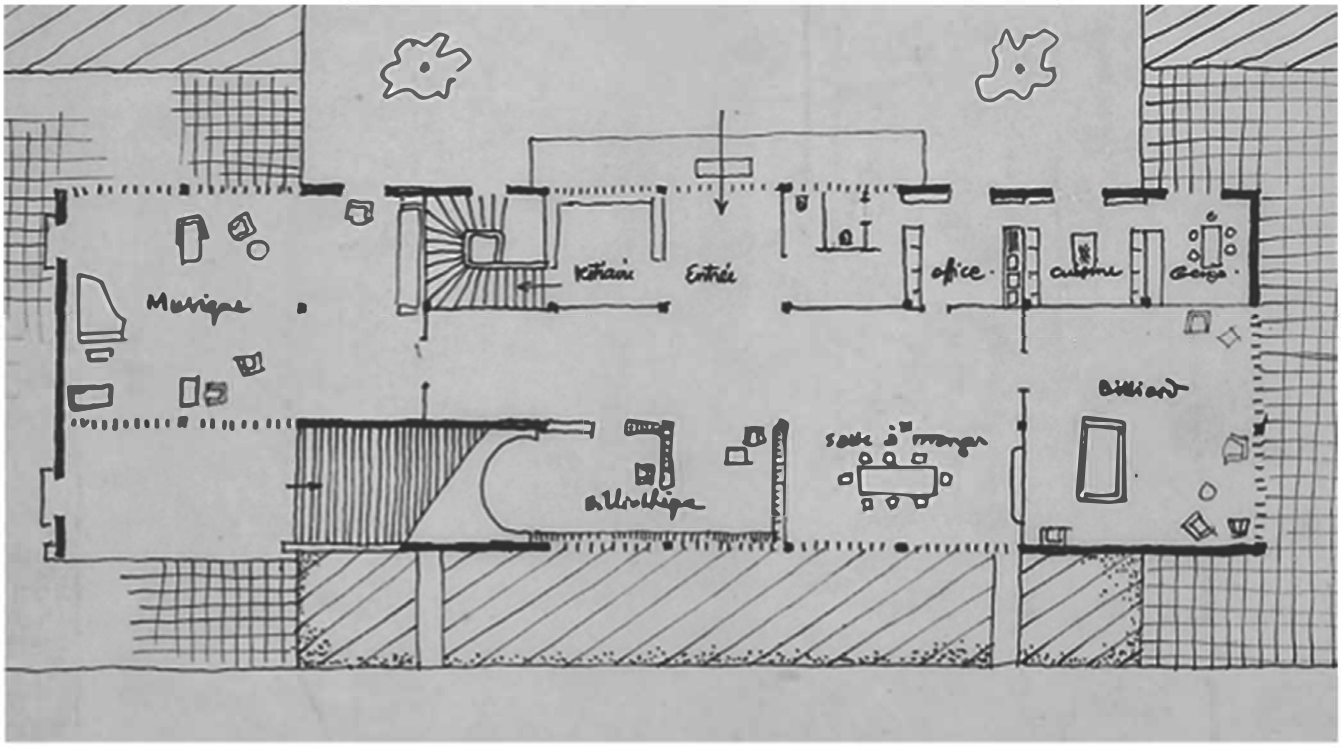


Figure 5. Plan of Villa Paul Poiret (1916). [Le Corbusier], FLC30281[6]

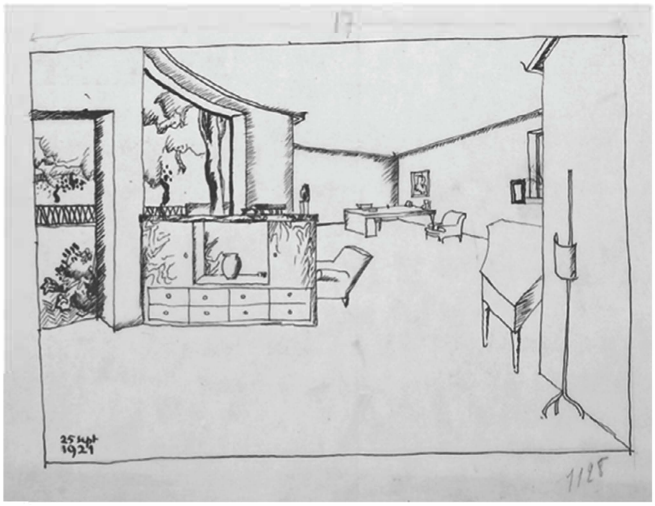


Figure 6. Perspective drawing of Villa Berque (1921). [Le Corbusier], FLC9316, 1921.9.25[6]

financial limitations, and so on) were imposed, most uses of the cabinets were the (dis) type, and this method has been continuously studied until the later years.

It was difficult to apply the cabinet (dis) as a partition of the interior space to private house projects which required specific solutions, as done in the "Pavillon de l'Esprit Nouveau." Only in Maison Guiette (1927) could Le Corbusier have realized the ideal cabinet (dis). For the owner, an avant-garde painter, Le Corbusier tried to place most cabinets from the walls autonomously. Some cabinets were put against the walls due to the elongated site, but lower cabinets (dis-1)—which did not reach the ceiling in the study and the lady's room and so on—created spatial openness and division simultaneously [Note 28].

Le Corbusier studied the same method for cabinet use (dis-1) in Maison Planeix (1927) where the project began at the same time as "Pavillon de l'Esprit Nouveau." Although the owner, a tombstone sculptor, had requested detailed forms with sketches [Note 29], Le Corbusier made his original cabinets partitions which reached the ceiling (dis-2). Also, in the living room and bedroom, he created partitions by stacking book cabinets (dis-2) to separate the rooms [Note 30]. Abandoning the visual continuity of rooms by the lower cabinet (dis-1) in the "Pavillon de l'Esprit Nouveau," he prioritized the independence of each room through cabinets (dis-1) reaching the ceiling. This had also been done in many house projects in the 1920s, such as at the Villa Stein-de Monzie (1927) or Villa Cook (1927) [Note 31]. For Le Corbusier, the cabinet was no longer "furniture" but a sort of partition dividing an interior space.

Later, Le Corbusier demanded that the new owner who bought Villa Stein-de Monzie maintain the interior space as follows:

"This house has been designed to present a complete unit of the exterior, interior layout, and furniture should be made to the unity. Please notice that this is a crucial point. I insist very much on this point that we would accept that you arrange the interior according to your wishes, but in the general spirit of the whole. It is truly a kind of necessity" [Note 32].

What Le Corbusier intended in a private residence is clear—to make "unity" in the interior space by making a cabinet (dis-2) equivalent to a wall, using a steel pipe which was a modern material for desks and chairs.

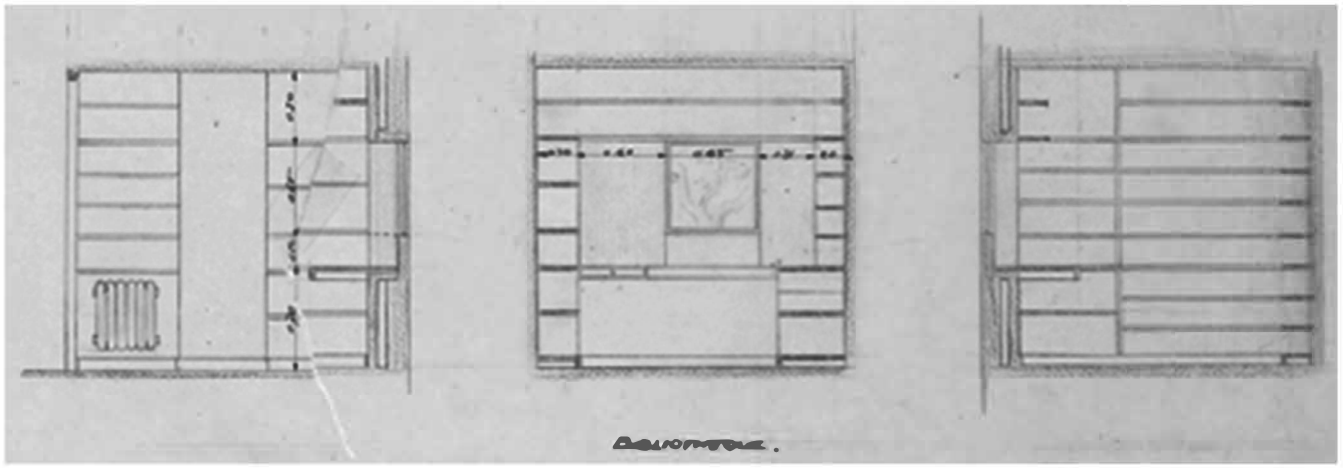


Figure 7. Cross section of the library of Atelier Ozenfant (1922). FLC7837[6]

Moreover, the method by which a cabinet (dis) autonomously separated from the wall and divided the space was expanded.

The cabinets in Villa Baizeau (1928) in North Africa, whose framed structure expressed the pure composition of the slab and pillars by "Dom-ino," were more autonomic. Even if Le Corbusier changed the interior arrangement with the autonomic cabinets according to Mrs. Baizeau's request, the building's facade did not change its appearance [Note 33]. This was also the case in the Villa Savoye (1931). The main floor of the square box pushed up by the pilotis was surrounded by the strip window around the 4 sides, which was a flexible response to Mrs. Savoye's instructions. The cabinets were placed against the wall in a "Dom-ino" skeleton (app), or they were separated from the wall (dis) [Note 34]. Also, at Le Corbusier's atelier (1933), on the top floor of the Immeuble Porte Molitor, the residential area was "made by Mrs. Le Corbusier's preference" [Note 35]. Various combinations of standard cabinets (dis) functioning to divide the rooms were devised, and these even had movable doors in cabinets (Figure 8) [Note 36].

Independent standard cabinets (dis) not only fulfilled the requirements of the owner but also guaranteed construction at a remote place like Villa Baizeau [Note 37]. In Villa Martinez de Hoz (1930) in Argentina, the bedroom and living room were divided by lower cabinets (dis-1), applying the method of display used in Salon d'Automne [Note 38]. After Villa Martinez de Hoz, Le Corbusier used the same method in projects at construction sites he could not visit easily. Villa Mme H. de Mandrot (1931), on the outskirts of Toulon, Maison Errazuriz in Chile (1930), or Villa "Le Sextant" at Les Matt (1935) was conceived as an application of Maisons Loucheur (1929) using local materials, and the cabinets (dis-1) were placed accurately [Note 39].

Le Corbusier's vacation cottage, Cabanon at Cap-Martin (1952), was also an "experiment" [Note 40]. It was a "prototype" [Note 41] for the construction of apartment houses using standard materials by mass-production. The frame structure, cabinets, desks, beds, and so on were unified according to the unique dimensions, the "Modulor" [Note 42] that Le Corbusier invented and, except for the desk integrated with one square window [Note 43], all furniture was equipped with wheeled cabinets (dis): "equipped cell" [Note 44].

The Le Corbusier Center (1964), which was the last project of a house-museum by Le Corbusier, also had autonomous

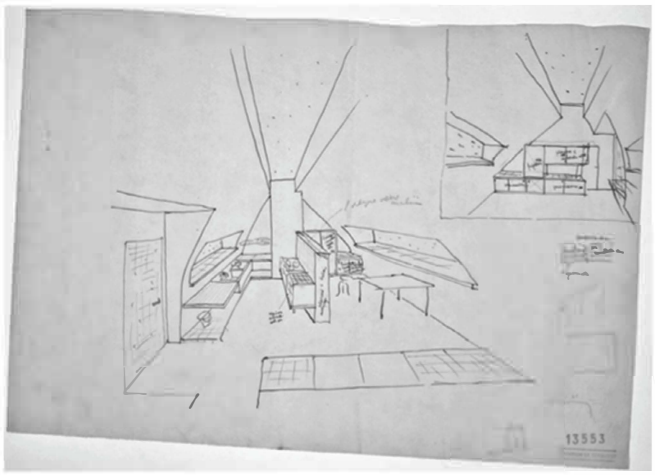


Figure 8. Perspective drawing of Residence-Atelier, Porte Molitor (1933) by Charlotte Perriand. [Charlotte Perriand], FLC13553[6]

furniture inserted into the skeleton of a steel-framed roof structure, or an "umbrella" [Note 45]. He gave the staff of the atelier the following instructions:

"I have asked you to study, during my absence, the cabinets that could be tested in Zurichhorn and, later, in all our residential buildings.

I spent very great efforts in 1925 in Pavillon de l'Esprit Nouveau that you know; in 1929, at the Salon d'Automne; later, during the Occupation (the plans were stolen).

I ask you to take again these ideas and to finalize them definitively because the new contacts with the industrialists (plastic material) make it possible to envisage a beginning of realization. That's what I have asked you to do, not to repeat the problem entirely. I do not forbid you to have your ideas, but in this problem, I want to realize today the things to which I have devoted a large part of my research" [Note 46].

Le Corbusier's "problem" was the standardization of cabinets (dis) by advanced industry from the first step. However, installing cabinets at "Pavillon de l'Esprit Nouveau" was only partially realized. Moreover, his cabinet system did not reach mass production [Note 47]. Nevertheless, he pursued the possibility

to the last. His conclusion at the final step was the "removable cabinet" [Note 48], which included the possibility of mobility.

4.3 The expansion of cabinets as a wall

While his method for arranging cabinets autonomously from the wall was refined, Le Corbusier continued to devise a cabinet to be incorporated in the walls (in-p) through several house projects.

The inception of this research was not only the cabinets (in-a) of atelier houses in the early 1920s but probably began with the problem of providing cabinets for women. In the Villa Meyer (1925) project, Mrs. Meyer primarily led a meeting with Le Corbusier [Note 49]. In the lady's boudoir and bedroom, the cabinets were arranged independently or placed against the wall (dis, app). They were used as a mechanism to divide the space. Furthermore, a cabinet (in-a) integrated with the spandrel wall under the strip window in Maison "Citrohan" (1920) was used and functioned as a dressing table for Mrs. Meyer (Figure 9 upper right) [Note 50].

The entire wall was covered with cabinets (in-a) at a restoration project in Villa Church (1929) [Note 51] (Figure 3). Le Corbusier hid the existing frame structure of the cabinets with sliding doors made of aluminum plate and integrated them with the wall. At that time aluminum was very expensive, but Le Corbusier explained to Mr. Church's trustee of the significance of "this big wall" as follows:

"1° The sliding door will be easier to handle because of the weight [Note 52].

2° We immediately have a clean way on which we will have no painting to do, on top of that we think that in the library, this big wall with whole aluminum will have a very good effect, it will be the only luxury of our decoration" [Note 53].

Meanwhile, from around 1930, Le Corbusier began to investigate other installation methods for cabinets under vault roofs called "Monol" types, and "Citrohan" flat roof types [Note 54].

In a weekend house with vault roofs (Maison Henfel) (1935), the cabinets were not the cabinets (in-a) hiding the wall like in Villa Church. Instead, the cabinets (in-p) were embodied in the wall with stone [Note 55]. Maison du Professeur Fueter (1950) also had the same style of cabinets (in-p) incorporated into the wall with brick [Note 56]. This method could express that "the construction is so simple, so easy" [Note 57] and, furthermore, "the roughness of the rough bricks" [Note 58].

In Maisons Jaoul (1953), the "furniture of separation" [Note 59] was set along the wall [Note 60]. Simultaneously, some were completely integrated with the wall (in-p) (Figure 10) [Note 61]. Based on the "Modulor" dimension system, the dualism of the wall/cabinet was integrated. According to Le

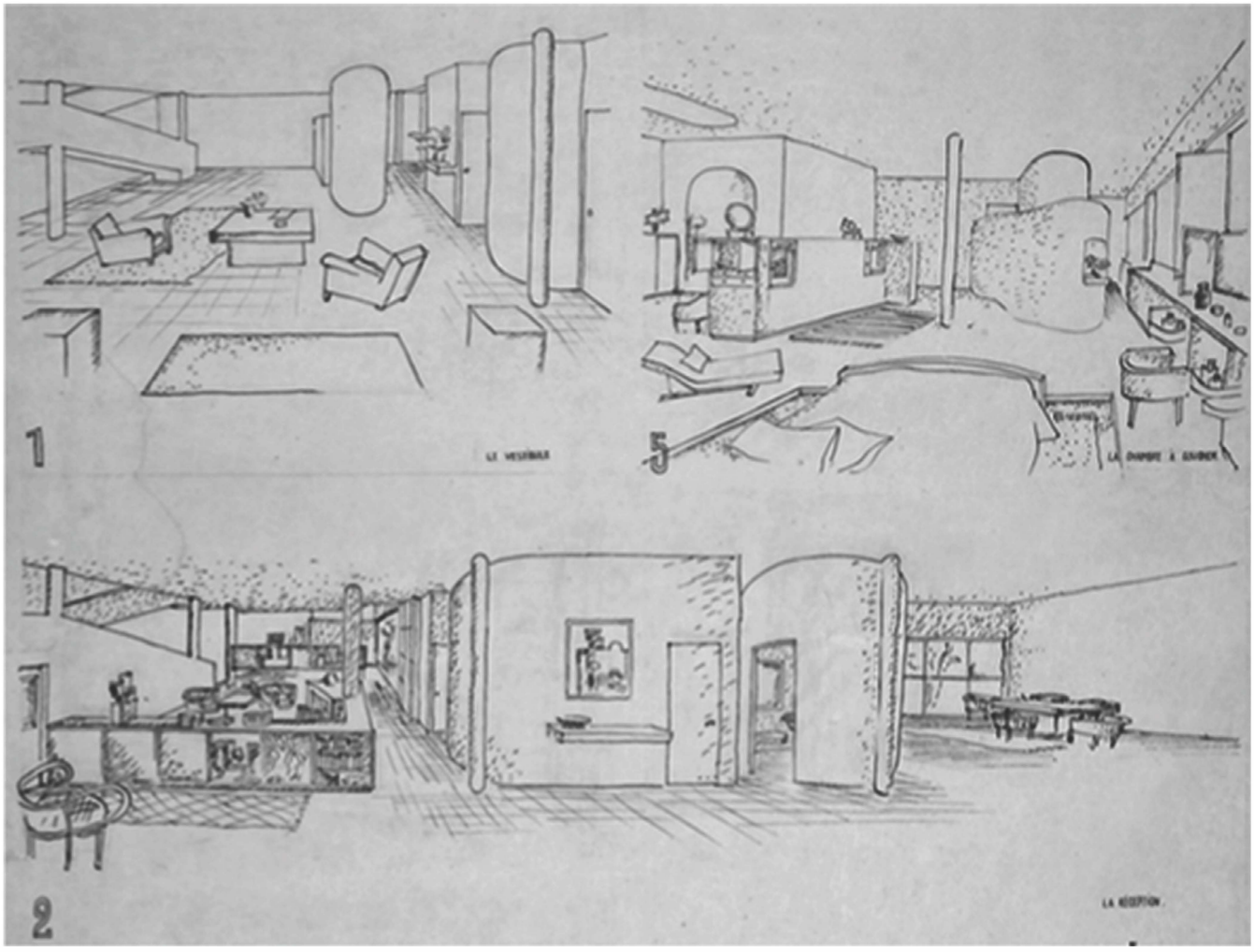


Figure 9. Perspective drawing of Villa Meyer (1925). [Le Corbusier], FLC31514[6]

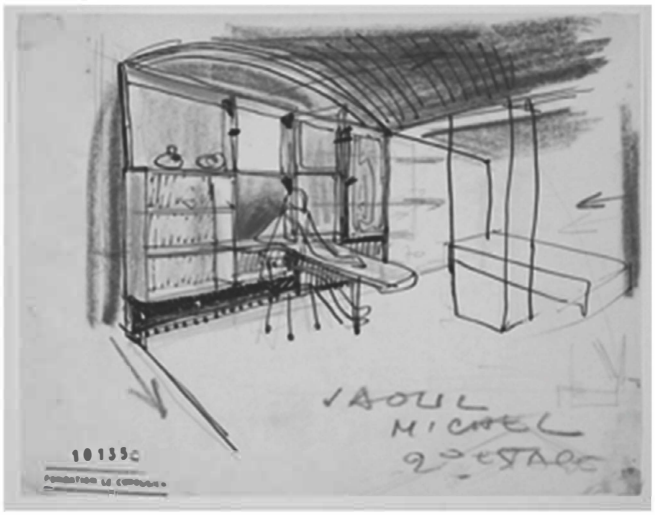


Figure 10. Perspective drawing of Maisons Jaoul (1953). Michel, FLC10135C[6]

Corbusier, the 3.66 m × 3.66 m dimensions of the frame structure and the cabinet unit allowed the interior space to be a "free space" [Note 62].

Additionally, this form of cabinet (in-p) was also applied in house construction in Ahmedabad, India. In the Villa Sarabhai project (1955), Le Corbusier devised cabinets on the walls of a parallel cylindrical vault space from the beginning [Note 63]. He was clearly investigating the possibility of the cabinet (in-p) at Maisons Jaoul [Note 64]. Simultaneously, it was devised for a traditional Indian house: the installation of cabinets did not block the passage of wind [Note 65]. Therefore, neither desk nor chair existed in this house. What was called "furniture" were only lower beds close to the floor [Note 66]. Thus, Le Corbusier searched for a new "wall" and even studied a photo mural on the "wall" of Villa Sarabhai [Note 67]. Indeed, according to his initial impression when he visited this house, the artworks and antique furniture owned by Mrs. Sarabhai did not fit on the walls, and they killed the environment, atmosphere, and spirit of the house [Note 68].

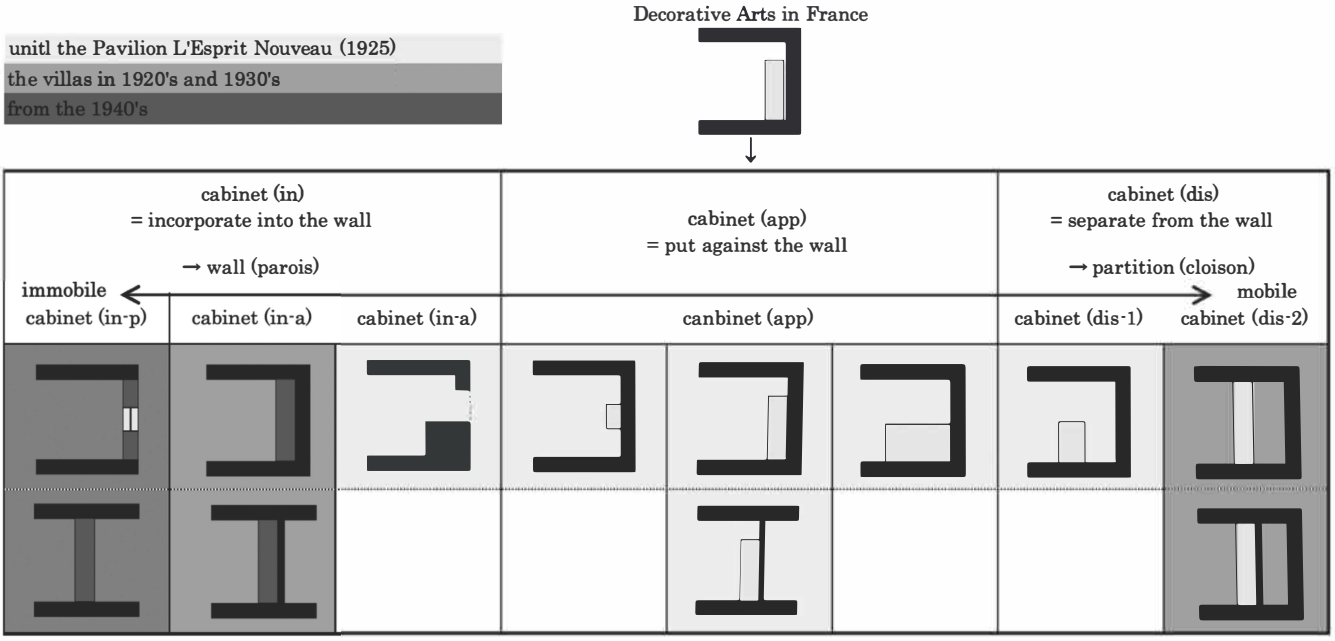
Given that the cabinet (in-p) was incorporated into the wall in the "Monol" type vaulted roof house, the "Citrohan" type of Maison pour Mr. Chinubhai Chimanbhai (1952) or Villa Shodhan (1956) also experimented with integrated cabinets with a frame structure. Its installation was different from the autonomy and mobility of equipment in Cabanon (1952) [Note 69]. As it was also related to Indian-specific living forms with beds [Note 70], there was no massive wall like a "Monol" house, but, unlike Villa Baizeau, light partitions were blocking the pillars with cabinets (in-p). Thus, Le Corbusier abandoned the use of the so-called "modern style" and luxurious materials, and pursued "simplicity" [Note 71], respecting traditional living [Note 72].

Le Corbusier looked back on Villa Shodhan (1956) as a "shelter":

"What did I give to Shodan? A palace, = a functional house. With his money and rough concrete and color, I gave him: the shade in summer, the sun in winter, the air flowing and fresh, at any season. Normal rooms each having his room = his shelter = his small house. He leaves the little house on the first, second terrace, in the shade, in the shelter. In a permanent moving air. He climbs on the roof, He sleeps there. Everywhere he or his guests, they are captivated, enchanted. It is a castle of the Loire? Yes for a smart prince" [Note 73].

The life in Villa Shodhan with the cabinets (in-p) was a minimal and fundamental "shelter." Although it was "a castle" there was nothing luxurious about it; there was free activity coordinating with nature, and no furniture or equipment to hinder it [Note 74]. It was a living image different from the "equipped cell" in Cabanon.

Table 2. Development of spatial composition of cabinets by Le Corbusier. Made by the author



5. Conclusion

Le Corbusier had established 3 types of cabinet installations at the exhibition of Salon d'Automne in 1929 as ideal theory: a cabinet put against the wall (app), an independent cabinet separated from the wall (dis), and a cabinet incorporated into the wall (in). However, his early works show that he began to experiment with the cabinet (app) as a mechanism to divide space from before the "Pavillon de l'Esprit Nouveau" in 1925, based on the traditional decorative art's method of putting cabinets against the wall [Note 75].

Through the process of the realization of houses from the 1920s to the 1930s, the cabinets (dis) became self-supporting from the wall and, after the Second World War, they were continuously examined. Cabinet installation was devised through the pursuit of a functional mechanism to divide an indoor space. The process was closely concerned with the mass-produced housing research after the First World War and remote construction. Thus, it was necessary for the architect to separate the cabinets from the immovable wall so that the cabinet (dis) could be automatically emplaced as a component without being overseen by the construction processes. It was also effective for answering the owner's various requests. Finally, this sort of cabinet (dis) has been studied as a movable cabinet after the Second World War.

Meanwhile, in the 1940s, cabinets were integrated into the wall (in-p), which could not be realized in the 1920s examined by the "Monol" type house with the vaulted roofs. Since the "Monol" type featured many walls supporting a vaulted roof, it was studied to incorporate cabinets into the wall, and adapted to India's climate.

In this way, Le Corbusier's method for the spatial composition of cabinets did not develop linearly, but continued to diversify to both poles while it was incorporated in the methodology of decorative arts (Figure 2). However, the question as to whether to temporarily possess movable cabinets or to incorporate them into the wall seems to be contradictory. Ultimately, the form of "furniture" would not remain.

Le Corbusier argued that life in the new era was "nomadic" and insisted on changing lifestyles according to circumstances [Note 76]. The cabinet (dis) responded to that request. However, if the cabinet (in) was in the house from the beginning, human beings did not have to have anything [Note 77]. In a space like an atelier's void, he always imagined "solitude and silence" [Note 78]. Le Corbusier's cabinet, that is, a new "wall" was the reflection of the ambivalent vision of remaining while being displaced somewhere.

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Notes

Note 1) "Decorative art" in the first half of the twentieth century did not simply mean additional "ornamentation." It must be regarded as a "decoration of space" with furniture, dishes, wallpapers, tapestries, lighting equipment, and even clothing in a space. It is necessary to reconsider the scheme of modernity as the "negation of decoration." cf. Nancy Troy, *Modernism and the Decorative Arts in France*, Yale University Press, New Haven and London, 1991.[20]

Note 2) cf. Shoichiro Sendai, "Formation of the Notion on 'Equipment' by Le Corbusier", *Journal of Architecture, Planning and Environmental Engineering (Transactions of AIJ)*, No. 739, 2017.9., pp. 2411-2419.[19]

Note 3) In the case of Le Corbusier, "equipment" in the interior space was not limited to houses. However, since the origin of his "equipment" was fundamentally related to the question of everyday life, this paper focuses on particular houses. In the case of Le Corbusier, bourgeois' suburban weekend houses, artists' atelier houses, art lovers' houses, ladies' houses, and his own houses constitute the central issue of "equipment."

Note 4) « casiers standarts ». cf. Le Corbusier, *Almanach d'architecture moderne*, Les Éditions G. Crès et Cie, Paris, 1926, p. 113.[8]

Note 5) In this paper, from the viewpoint of spatial theory, we do not refer to the formal features of cabinet design.

Note 6) It is possible that the equipment was realized without architectural drawings. Originally, we might verify the actual condition of equipment in-house using photographs etc. However, in this paper, we focus on the process of the architect's realization, using the drawings.

Note 7) The representative research is as follows: cf. Flora Samuel, *Le Corbusier in Detail*, Architectural Press, Oxford, 2007[18]; Arthur Rüegg, *Le Corbusier, Meubles Intérieurs 1905-1965*, Verlag Scheidegger & Spiess, Zurich, 2012[17]; Cloé Pitiot, « Le Corbusier, le mobilier corps et âme », sous la direction d'Olivier Cinqualbre et Frédéric Migayrou, *Le Corbusier, mesures de l'homme*, Éditions du Centre Pompidou, Paris, 2015, pp. 85-89.[3]

Note 8) « Établis en série, ces casiers standarts juxtaposables suivant de multiples combinaisons, pourront être vendus au Bazar de l'Hôtel-de-Ville ou à l'Avenue des Champs-Élysées; ils se mettent contre le mur à toute hauteur, ou constituent le mur. » (Le Corbusier, *Almanach d'architecture moderne*, op. cit., p. 113.[8])

Note 9) « L'un disposera les casiers contre les murs de ses chambres ou constituera avec eux des cloisons nouvelles à pleine hauteur ou à mi-hauteur (voir Pavillon de l'Esprit Nouveau, 1925); l'autre construira ses murs en incorporant les casiers dans les maçonneries. » (Le Corbusier, *Précision sur un état présent de l'architecture et de l'urbanisme*, G. Crès et Cie, Paris, 1930, p. 108, p. 115.[10])

Note 10) cf. Le Corbusier et Pierre Jeanneret, *Œuvre complète 1910-1929*, Girsberger, Zürich, 1929, p. 100.[9]

Note 11) « La réduction du mobilier à l'état de casiers constituent à l'occasion le mur lui-même peut être obtenue aussi par des méthodes rudimentaires de construction en ciment armé: Je dessine le plafond et le plancher d'un étage: je divise la hauteur en quatre secteurs par exemple, au moyen de trois planchers de béton armé, épaisses de quelques centimètres, allant d'un mur à l'autre ou s'arrêtant à mi-parcours. Je maçonne tantôt sur un bord de mes planches de béton, tantôt sur l'autre, suivant les besoins.... Voici de magnifiques parois-casiers dans lesquelles s'insèreront les « équipement intérieurs » dont j'ai parlé déjà (106). » (Le Corbusier, *Précision*, op. cit., p. 108, pp. 115-116.[10])

Note 12) It is not certain whether Le Corbusier strictly defined "wall" (mur), "partition" (cloison), or "inner wall" (paroi). Etymologically, "wall" (mur) supports a frame structure, "partition" (cloison) divides an interior space, and "inner wall" (paroi) means an inner wall itself. cf. Yutaka Mizuno, "Wall and Mur," *International Research*, No.4, 1987.6., pp. 209-231.[15]

Note 13) Le Corbusier mentioned another project in Precision (1930) in which cabinets were "incorporated" in the wall at the Palais du Centrosoyus (1929). He used the same rhetoric as in Villa Church (1929). These cabinets were in contact with both sides. cf. Le Corbusier, *Précision*, op. cit., p. 116.[10]

Note 14) « Je dessine en plan et coupe un dispositif moderne: fenêtre, cloisons et casiers. J'ai gagné une place considérable; on peut circuler à l'aise; les gestes seront rapides et exacts; le rangement automatique.

Ce sont des minutes gagnées, chaque jour; précieuses minutes (99.) » (Le Corbusier, *Précision*, op. cit., pp. 109-110.[10])

Note 15) cf. [Le Corbusier], FLC20705[6]; [Le Corbusier], FLC20707A.[6] Such a cabinet (in-a), integrated with the spandrel wall under the strip window, was studied for the first time in the Maison "Citrohan" (1920). It was often later used in house projects in the 1920s, for example in the study of Villa La Roche (1923) or the living room in Villa Jeanneret (1923). However, despite the fact that Villa "Le Lac" for his parents (1923) was a typical house with strip windows, there was no cabinet integrated with the spandrel wall under the window. In this house, only the desk was fixed into the spandrel wall. Le Corbusier was often obsessed with such a window/desk relationship. This space diagram, which was also reproduced in Cabanon (1952), originated in the scenery of monasteries and farmers that Le Corbusier visited during the trip to the east in 1911. cf. Le Corbusier, *Le Corbusier Carnets 3 1954-1957,* Fondation Le Corbusier, Paris, The Architectural History Foundation, New York, Éditions Herscher/Dessain et Tolra, Paris, 1981, p. 1053, 1957.11.3[12]; Le Corbusier, *Le voyage d'orient,* Les Éditions Forces vives, Paris, 1966, pp. 20-21.[4]

Note 16) The "decorative art" that Le Corbusier criticized in *Decorative Art of Today (1925)* meant the conventional design of furniture placed against the wall. However, he also had a negative opinion of modern furniture conceived by Francis Jourdan as one of the first attempts to integrate furniture with walls (cf. Arthur Rüegg, op. cit., pp. 58-59[17]). cf. Le Corbusier, *L'art décoratif d'aujourd'hui,* G. Crès et Cie, Paris, 1925, pp. 146-164.[7]

Note 17) cf. AFLC, CARNET25-6440~6465[5]; [Le Corbusier], FLC6462.[6]

Note 18) cf. Juline Caron, « Une villa de Le Corbusier 1916 », *L'Esprit Nouveau*, N°6, 1921.3, pp. 679-704.[21]

Note 19) cf. AFLC, lettre de Charles-Édouard Jeanneret à Mme Schwob, R3-3-192, 1923.10.28.[5]

Note 20) Modernisation of "decorative arts" has already started before Le Corbusier's activity. The International Exhibition of Decorative Arts and Modern Industry, held in Paris in 1925, was a big turning point. cf. Chika Amano, *Decoration and Art*, Brucke, Tokyo, 2001.[1]

Note 21) cf. [Le Corbusier], FLC6462.[6] Conversely, Le Corbusier tried to study ideas beyond "decorative art." In the "Dom-ino" system, he had studied a mass-produced built-in cabinet. cf. Le Corbusier-Saugnier, *Vers une architecture*, G. Crès et Cie, Paris, 1923, p. 197.[13]

Note 22) cf. [Le Corbusier], FLC30281.[6]

Note 23) cf. Le Corbusier-Saugnier, op. cit., p. 204.[13] Even in the mass production house with the vault roof ("Monol" type), the lower cabinets that did not reach the ceiling were set perpendicularly to the wall and partitioned the space efficiently. cf. *Ibid*., p. 205.[13]

Note 24) However, in the case of Maison de week-end à Rambouillet (1923), a cabinet (dis-1) separated from the wall would be changed into a cabinet (app) placed against the wall. cf. FLC30071[6]; [Le Corbusier], FLC30069.[6]

Note 25) Such a lower cabinet would be adapted in the units of Immeubles-villas (1922). cf. Le Corbusier-Saugnier, *Vers une architecture*, G. Crès et Cie, Paris, 1923, p. 208.[13]

Note 26) cf. AFLC, H1-17-18, lette de Pierre Jeanneret à Amédée Ozenfant, 1925.6.5[5]; AFLC, H1-1-27, lettre de Jacques Lipchitz à Charles-Édouard Jeanneret, 1924.3.21.[5]

Note 27) cf. AFLC, P5-1-208, lettre de Charles-Édouard Jeanneret à Amédée Ozenfant, 1925.4.16.[5] However, in the first project of this house, the independent cabinets were set in the center of the gallery. Finally, they were incorporated into the space under the slope, and changed to the sliding cabinets. cf. [Le Corbusier], FLC15294D[6]; FLC15205[6]; [Charlotte Perriand], FLC15290.[6]

Note 28) cf. [Le Corbusier], FLC8594A, 1926.2.28.[6] The installation of the cabinets in Maison Canale (1929) in the similar narrow site also used the same method. cf. FLC8519[6]; FLC8535.[6]

Note 29) cf. FLC8973.[6]

Note 30) cf. FLC8902, 1926.5.28[6]; FLC9238.[6]

Note 31) On the studies of the cabinets in Villa Stein-de Monzie (1927), cf. FLC10494,[6] and Villa Cook (1927), cf. [Le Corbusier], FLC8588[6]; FLC8349[6]; FLC8309,[6] both included cabinets that divided space between the kitchen and the living room. We can only see the documents concerning the estimation sheets on these cabinets. cf. AFLC, H1-6-200, Devis des travaux de menuiserie, reçu. 1926.11.23.[5] Additionally, the division of kitchen/living room/bedroom of the 2 detached houses (C2) of Weissenhof at Stuttgart (1927) was also made possible by independent cabinets that reached the ceiling. « Je reçois v. amicale lettre du 8 o^{t}. Je trouve très heureuse votre idée de meubler les 2 maisons comme si elles étaient habitées. Mon opinion sur le genre de meuble? *Cela m'est tout à fait égal*, avec cette réserve que le mobilier ne doit comprendre que des *tables et des sièges*, et pas de buffets ou armoires, *presque tout le nécessaire existe pour chaque pièce*: les sièges peuvent être très différents les uns des autres, pour le travail, pour le repos, la lecture, la conversation etc. Les tables pourraient être *standart* et *juxtaposable* faisant ainsi de petites ou de grandes tables. » (cf. AFLC, H1-11-220, lettre de Le Corbusier à A. G. Schmeck, 1928.2.10[5]) "I receive your friendly letter of the eighth. I find very happily your idea of furnishing the 2 houses as if they were inhabited. My opinion on the type of furniture? *It's quite equal for me* [to the building], with the proviso that the furniture should only include *tables and chairs*, and no buffets or cabinets, *almost all is needed for each room*: the chairs can be very different from each other, for work, for rest, reading, conversation, etc. The tables could be *standard* and *juxtaposed* thus making small or large tables."

Note 32) « Cette maison a été conçue pour présenter une unité complète de l'extérieur, de la disposition intérieure et le mobilier devrait être faite à l'union. Vous vous rendrez compte que c'est là un point capital. J'insiste beaucoup sur ce point que nous aimerions vous aménager l'intérieur conformément à vous désirs, mais dans l'esprit général de l'ensemble. C'est véritablement une espèce de nécessité. » (AFLC, H1-4-111, lettre de Le Corbusier à M. Steen, 1935.10.4.[5])

Note 33) cf. FLC8488; AFLC, H1-10-31, lettre de Pierre Jeanneret à Madame Baizeau, 1929.6.5.[5]

Note 34) cf. AFLC, H1-12-66, lettre de Pierre Jeanneret à Madame Savoye, 1929.8.24.[5]

Note 35) cf. AFLC, H2-1-430, Document état locatif, s.d.[5]

Note 36) cf. [Charlotte Perriand], FLC13352[6]; [Charlotte Perriand], FLC13553[6]; FLC13450[6]; FLC13872.[6]

Note 37) The problem of construction in remote sites led to the study of mass-produced housing at Maisons Loucheur (1929), using a dry construction method. This concerned the study of Maison "Minimum" (1926) due to the industrial production of houses in Quartiers Modernes Frugès at Pessac (1924). Through the various studies, the water equipment became independent units and the cabinets also became independent from the space and divided the rooms. cf. FLC18240.[6]

Note 38) cf. AFLC, I1-17-23, lettre de Le Corbuseir à Julien Martinez, 1930.12.3[5]; [Le Corbusier], FLC24131[6]; [Charlotte Perriand], FLC24126.[6] Such an installation of the standard cabinets was at the request of the owner. cf. AFLC, I1-17-23, lettre de Le Corbuseir à Julien Martinez, 1930.12.3[5]; [Le Corbusier], FLC24131[6]; [Charlotte Perriand], FLC24126.[6]

Note 39) cf. AFLC, H3-2-8, lettre de Le Corbusier à Madame Hélène de Mandrot, 1931.12.6.[5] In Maison du Docteur Curutchet (1949) in Argentina, the cabinets were also set in "Dom-ino" skeletons. To secure enough ventilation, the interior was shaded by the light curtains instead of the wall. cf. AFLC, I2-7-113, lettre de Le Corbusier à Germaine Curatelle-Manes, 19854.1.14.[5]

Note 40) cf. AFLC, M2-9-66, lettre de Le Corbusier à Robert Rebutato, 1950.5.4.[5]

Note 41) cf. AFLC, M2-9-82, lettre de Le Corbusier à Jeanne Veret, 1952.12.37.[5]

Note 42) cf. Le Corbusier, *Modulor* 2, Les Éditions de L'Architecture d'Aujourd'hui, Paris, 1955, pp. 253-255.[11]

Note 43) cf. FLC24335[6]; FLC24340.[6] Only the desk fixed into the wall might be related to Le Corbusier's research of the farms near the construction site of Cabanon (1952). There, he discovered a farm

house without furniture, and only a desk was equipped under the square window. cf. AFLC, Album Nivola, W1-8-110, 1951.8.12.[5]

Note 44) cf. « la celleule équipée », cf. Le Corbusier, *Le Corbusier Carnets 4 1957-1964,* Fondation Le Corbusier, Paris, The Architectural History Foundation, New York, Éditions Herscher/Dessain et Tolra, Paris, 1982, p. 1010, 1963.7.23.[12]

Note 45) cf. Le Corbusier, FLC21078, 1961.12.12[6]; Le Corbusier, FLC21079, 1961.12.12[6]; Le Corbusier, FLC21081, 1961.12.12.[6]

Note 46) « Je vous ai demandé de mettre à l'étude, pendant mon absence, les casiers dont l'expérimentation pourrait se faire à Zurichhorn et, plus tard, dans tous nos bâtiments d'habitation. J'ai consacré des efforts très grands, en 1925, au Pavillon de l'Esprit Nouveau que vous connaissez; en 1929, au Salon d'Automne; plus tard, pendant l'Occupation (les plans ont été volés). Je vous demande de reprendre ces idées et de les mettre au point définitivement car les nouveaux contacts avec les industriels (matière plastique) permettent d'envisager un début de réalisation. C'est cela que je vous ai demandé et non pas de recommencer le problème entièrement. Je ne vous interdis nullement d'avoir vos idées, mais, dans ce problème, je tiens à ce que l'on réalise aujourd'hui les choses auxquelles j'ai consacré une part importante de mes recherches. » (AFLC, F1-3-316, Note à l'attention de l'Atelier, 1962.4.3[5])

Note 47) cf. Charlotte Perriand, *Une vie de création*, Éditions Odile Jacob, Paris, 1998, p. 250.[16]

Note 48) « casiers amoviles », cf. AFLC, F1-3-245, lettre de Le Corbusier à Ignacio Pivovano, 1950.6.2.[5]

Note 49) Le Corbusier should have met with Mrs Meyer to discuss the details of furniture, but most of the documents concern estimates of construction.

Note 50) cf. [Le Corbusier], FLC31514[6]; FLC10370, 1926.4.21.[6] The living room of Villa Jeanneret (1923) for his wife Rotti Laaf also had the same long strip window/cabinets composition.

Note 51) cf. FLC31463[6]; FLC31464[6]; FLC8190.[6] For renovation, there are no plans or sectional views that accurately reflect this sketch (Figure 3). The same method was applied to library cabinets in the renovation project, the Appartement de M. Charles de Beistegui (1931). cf. FLC17499[6]; FLC17431, 1929.6.3.[6]

Note 52) The sliding door was adopted at a relatively later time, compared to the cabinet with a hinged door or with a drawer. The first example was the Villa La Roche renovation project in 1928 when Charlotte Perriand entered Le Corbusier's atelier and designed this cabinet with a sliding door (cf. Charlotte Perriand, *op. cit.*, p. 23, p. 60[16]). One speculates that the sliding cabinet shelf was influenced by Maekawa Kunio who enrolled in the atelier at that time. cf. Jacques Barsac, *Charlotte Perriand, Complete Works, Volume 1 1903-1940*, Scheidegger & Spiess, Zurich, 2014, p. 122.[2]

Note 53) « 1° Les coulissants seront plus facile à manier à cause du poids. 2° Nous avons de suite une manière propre sur laquelle nous n'aurons aucune peinture à faire, en plus de cela nous pensons que dans la bibliothèque, ce grand mur entier en aluminium sera d'un très bon effet, ce sera le seul luxe de notre décoration. » (AFLC, H3-3-97, lettre de Le Corbusier à Moreau Lanande, 1929.1.21[5])

Note 54) The "Monol" type house dates back to Maison d'artiste (1922). There was minimal independent cabinets and ceiling lighting in the reinforced concrete with vaulted roof in the atelier space. cf. [Le Corbusier], FLC30198.[6]

Note 55) cf. [Le Corbusier], FLC9250[6]; FLC24229[6]; FLC9254.[6]

Note 56) cf. Le Corbusier, FLC18515, 1949.11.10[6]; FLC18504, 1950.6.27[6]; FLC18506, 1950.6.27.[6]

Note 57) « la conctruction est si simple, si facile que votre architecte entrepreneur peut certainement la réalisation sur place. », cf. AFLC, I2-7-137, lettre de Le Corbusier à Professeur Fueter, 1949.11.14.[5]

Note 58) « la rudesse des briques brutes », cf. AFLC, I2-7-141, lettre de Le Corbusier à Professeur Fueter, 1950.3.17.[5]

Note 59) « meuble de séparation », cf. AFLC, J1-14-413, lettre de Le Corbusier à Charles Barberis, 1955.3.21.[5]

Note 60) cf. Le Corbusier, FLC10099, 1952.3.1.[6]

Note 61) cf. Michel, FLC10135C[6]; FLC10037[6]; FLC10169.[6]

Note 62) « l'intérieur des espace libres », cf. AFLC, J1-14-396, lettre de Le Corbusier à Charles Barberis, 1955.1.4.[5]

Note 63) cf. FLC31884, 1952.6.12[6]; Véret, FLC6709, 1953.4.24.[6]

Note 64) cf. AFLC, P3-7-57, lettre de Doshi à Jean-Louis Véret, 1953.9.8.[5]

Note 65) cf. AFLC, P3-7-84, lettre de Tobito à Jean-Louis Véret, 1954.10.20.[5]

Note 66) Le Corbusier studied the floor's more than the wall's material and employed traditional local natural stone in it. cf. AFLC, P3-7-86, lettre de Tobito à Jean-Louis Véret, 1954.10.20[5]; P3-5-201, lettre de Le Corbusier à Manorama Sarabhai, 1954.15.3.[5]

Note 67) cf. [Le Corbusier], FLC6725[6]; Le Corbusier, *Le Corbusier Carnets 3 1954-1957,* op.cit., p. 42, 1954.2.24[12]; AFLC, P3-5-502, Note pour Michel dictée par L-C, 1954.3.24.[5]

Note 68) cf. AFLC, P3-5-223, lettre de Le Corbusier à Manorama Sarabhai, 1956.5.1.[5]

Note 69) cf. Doshi, FLC6357, 1954.1.17[6]; Doshi, FLC6367, 1954.1.17[6]; Doshi, Véret, FLC6409A, 1953.5.20, 1954.1.30[6]; Doshi, Véret, FLC6419A, 1953.5.19, 1954.1.30.[6]

Note 70) cf. AFLC, P3-5-367, lettre de Le Corbusier à Chinubhai Chimanbhai, 1954.4.26.[5]

Note 71) « simplicité », cf. AFLC, P3-5-371, lettre de Le Corbusier à Chinubhai Chimanbhai, 1954.9.22.[5]

Note 72) While pursuing new "walls" integrated into the walls in the Ahmedabad houses of Villa Sarabhai (1955) and Villa Shodhan (1956), Le Corbusier equipped these houses with artificial lighting products he designed. cf. AFLC, P3-5-208, lettre de Jacques Michel à Manorama Sarabhai, 1953.9.8[5]; AFLC, P3-7-109, lettre de Doshi à Jean-Louis Véret, 1953.9.8.[5]

Note 73) « Qu'ai-je donné à Shodan? Un palais, = une maison fonctionnelle. Avec son argent et de du béton brut et de la couleur, je lui ai donné: l'ombre en été, le soleil en hiver, l'air circulant et frais, à toute saison. Des chambres normales chacun ayant sa chambre = son abri = sa petite maison. Il sort de la petite maison sur la lère, deuxième terrasse, à l'ombre, à l'abri. Dans un air mouvant permanent. Il montre sur le toit, Il y dort. Partout lui ou ses hôtes, sont à l'abri, son captivés, enchantés. C'est un Château de la Loire? Oui pour un prince intelligent » (Le Corbusier, *Le Corbusier Carnets 3 1954-1957,* op.cit., p. 451, 1955.11.13[12])

Note 74) Le Corbusier looked down on the criticism that such a life image was only an anachronistic "return to nature." For him, such critic was unsophisticated futurists. cf. Le Corbusier, *op.cit.,* p. 1078, 1957.11.1.[12]

Note 75) The size of the cabinet was not decided by internal measurement; the practical function of storage was not taken into account.

Note 76) cf. Le Corbusier, « Tapisseries Muralnomad », *Zodiac*, n°7, 1960, p. 57.[14]

Note 77) cf. Le Corbusier et son atelier rue de Sèvres 35, W. Boesiger éd., *Œuvre complète 1952-1957*, Girsberger, Zürich, 1957, p. 208.[9]

Note 78) cf. Le Corbusier, *Précision*, op.cit., p. 116[10]; Le Corbusier, *Le Corbusier Carnets 4 1957-1964,* op.cit., p. 912, 1962.7.[12] This image can be traced back to the living space of "solitude and silence" in Emma's monastery where Le Corbusier visited in a trip to the east in 1919. cf. AFLC,A3-1-324-333,« Unité d'habitation de grandeur conforme », 1957.4.1.[5]

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