

From Bordeaux to Barcelona – Le Corbusier’s creative journey that went unnoticed

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The evolution of Le Corbusier’s architecture from cuboid, slick and white forms, and the universality of Purism in the 1920s, to an earthy roughness, undeniable inspired by Mediterranean vernacular traditions after about 1930 is well-known. For example, the Weekend House represented a very obvious tectonic shift from Villa Savoye. Since they share the same basic unit form, the unbuilt Barcelona Residential Quarter (1933) seems to be a continuation of the housing estate in Pessac (1925), the only ground-level, multi-family scheme Le Corbusier ever built. This paper argues that it represented an equally radical rethink of the principles employed in the Pessac housing scheme, but that the differences are much more subtle. The aim is to search for, and analyse the factors that mediated in the transformation of the concept from Bordeaux to Barcelona, only eight years apart.

Le Corbusier was a fierce proponent of high-rise “vertical garden cities” all his life. His decision to conceptualise the Barcelona Quarter as a low-rise complex is, therefore, unexpected especially considering that CIAM (of which he was a leading member) at that time was firmly committed to high-rise slabs in park-like settings. But Le Corbusier himself alluded to his intentions when he declared that he wished to create “a delightful oasis of refreshing greenery”. The word “oasis” reminds of his frequent visits to Algeria, and his observations are briefly reviewed in order to better understand the formative aspects of his experience. General layout drawings of the project were drawn on computer and these provided the data for the subsequent exploration of the urban framework and the design of the constituent dwellings. The influence of the Arab vernacular on both his urbanism and architecture became very apparent, but it seemed as if the vernacular served to enhance contextual, functional and aesthetic requirements, rather than being a dominantly formative force, as was the case at (say) Roquet-Rob in 1949.

Key words: Le Corbusier, Barcelona Residential Quarter, Pessac, North African vernacular

By 1929 Le Corbusier’s Five Points of a New Architecture had become entrenched as the fundamental tenets of Purism and later of Modernism as a whole: (1) columns, (2) roof gardens, (3) a free plan, (4) long windows, and (5) a free façade. Villa Savoye at Poissy in its (then) rural setting was unquestionably the epitome of his Purist Villas – taut-skinned, crisp and white. Design started in October 1928 on this three-storey building with a roof garden over a patio-inside-square first floor, and a curved enclosure with utilities and columns on the ground floor. All three levels could be accessed by means of a ramp. At that stage he considered Villa Savoye as a sort of universal housing archetype. The Weekend House of 1935, however, built in a Paris suburb, was the typological and morphological opposite – a small, rustic house with planted flat vaulted roof, and exposed stone, brick and concrete, and glass blocks (Figure 1). The house reminds one of the vaulted vernacular houses of the Mediterranean and, in stark contrast to Villa Savoye, was intended to merge with the site.

The transformation of his architecture from the white machine aesthetic of Purism to rougher, regional forms, often based on vernacular precedent, has been well-documented, perhaps most extensively by Charles Jencks in *Le Corbusier and the continual revolution in architecture* (2000). Kenneth Frampton (2007: 224) comments on Le Corbusier and Pierre Jeanneret’s “apparently spontaneous acceptance of ‘vernacular’ construction as a mode of expression”. His painting developed similarly. Jencks notes an obvious change in 1928 when he started to replace the “Purist bottles, flasks and pipes” with “things as shells, rocks and people” (2000: 188): “He was deliberate about presenting this new approach to natural subject matter and biological form”.

Just as his architecture and art evolved during this period, so did his town-planning. From Baroque-type grids with diagonals, symmetrical designs on cruciform or linear axes, he moved to juxtaposed nets with different geometries for vehicles and pedestrians, often based on curvilinear, trigonometric and linear forms.

Whereas his city plans and houses after 1930 tend to be radically different from those of the 1920s, at first glance the residential quarter for low-income workers in Barcelona appears to be a continuation of the village of Pessac in Bordeaux, his only realised ground-orientated multi-family scheme (Figure 2). Called a “garden-city” by Le Corbusier (1960: 70) it was hugely controversial. The Barcelona Quarter is an unbuilt project that has not been widely discussed (or criticised) in the literature. This paper will demonstrate that it was nevertheless also shaped by, and indicative of, the transformation of Le Corbusier’s theories and principles during that time. It explores known and perceived influences that mediated the transformation of the concept, and analyses how these influences were made manifest in the design.


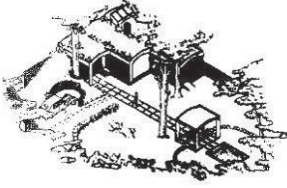
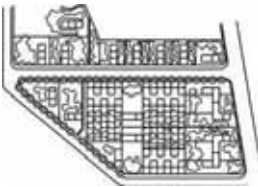
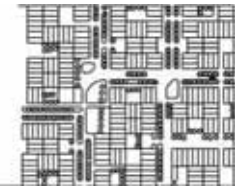
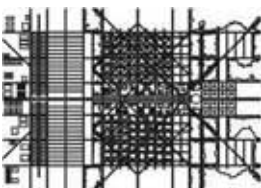

HOUSES	 1929 – Villa Savoye	 1935 – Weekend House
ESTATES	 1925 – Pessac	 1933 – Barcelona Quarter
CITIES	 1930 – Radiant City	 1931 – Algiers

Figure 1
Projects from 1925 to 1935 (diagrams by the author).

***Zeitgeist* and contemporaneous projects**

In 1933, when the Barcelona Quarter was designed, the American Garden City Movement had achieved maturity, notably with the design and part construction of Radburn in 1929. In Europe the *Congrès Internationaux de l’Architecture Moderne* (CIAM), founded by Le Corbusier, Sigfried Gideon, Walter Gropius and others, held conferences in Frankfurt in 1929 on the minimum dwelling (German: *Existenzminimum*) and at Brussels in 1930 on high and medium density housing. They essentially accepted 10-12 storeys as the optimum height, distributed in narrow slab blocks following a strict north-south orientation (Figure 3). The alternating strips of building development and open space were called *Zeilenbau*, resulting in about 15 per cent coverage (Rowe 1993: 187).

While working on the Barcelona Quarter Le Corbusier designed two significant apartment projects for Algiers, both innovative and compatible with the ideology of CIAM. The first was for a number of long, stepped apartment buildings for the outskirts, called the Durand apartments after the client (Figure 4). These consisted of four stacked double-storey units on three levels of circulation, parking and amenities. These became the prototypes of thousands of seaboard apartments at coastal resorts. The other was for a tall building on sloping site, with deep, narrow maisonettes, and with two levels at the entrance left open to the view (Figure 5).

The side exposed to the sun had a brise-soleil, while the other was glazed (Le Corbusier 1960: 108, 109).

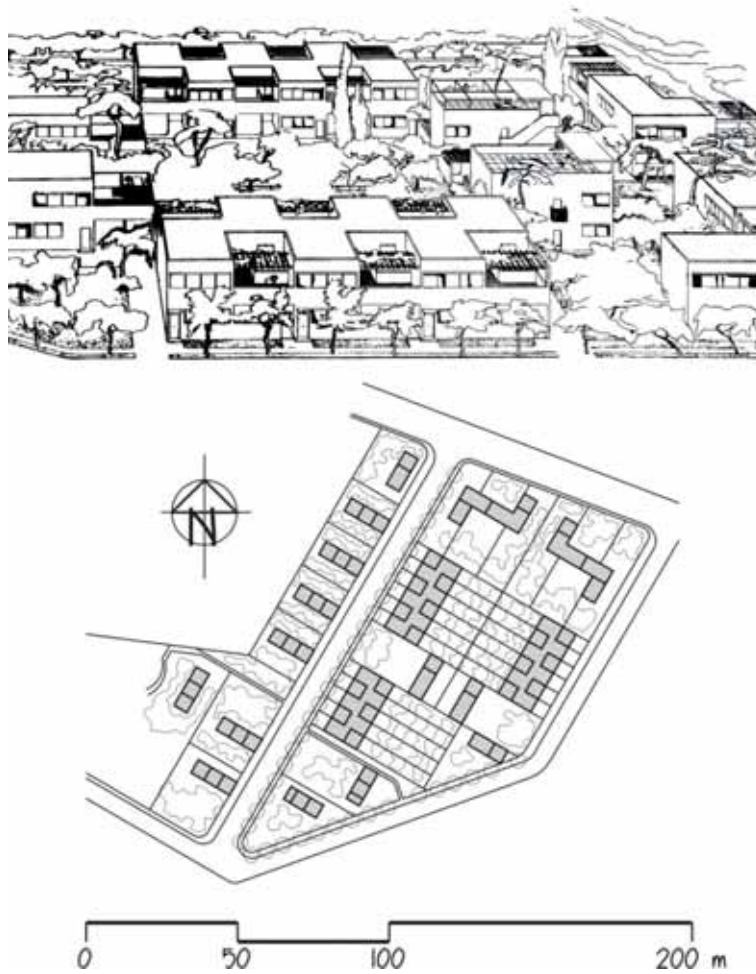


Figure 2

Top: Partial perspective view (Le Corbusier 1927: 252)
 Bottom: Site plan of Pessac (drawing by the author from LC's axonometric in Besset 1992: 97).

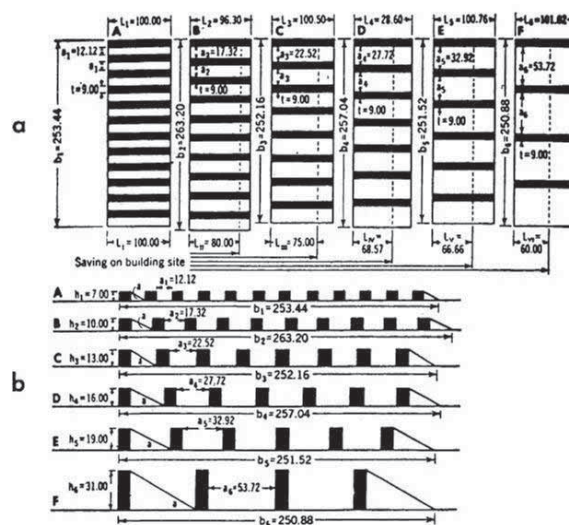


Figure 3

Studies of building height, density and sunlight by Walter Gropius in 1928, released to justify *Zeilenbau* (Source: Rowe 1993: 187).

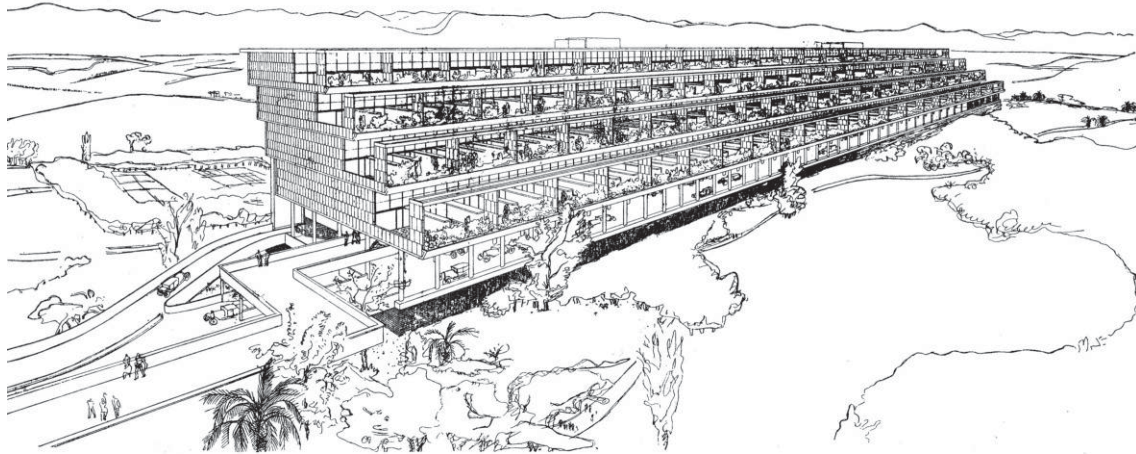


Figure 4
Perspective view of a stepped apartment building, 1933 (Le Corbusier 1964: 294).

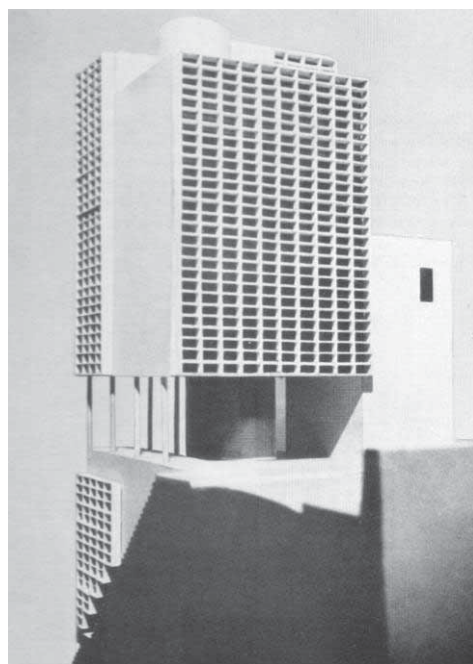


Figure 5
Residential skyscraper in Algiers with brise-soleil, 1933 (Le Corbusier 1960: 109).

Since he was a leading figure in CIAM, why did his design for Barcelona deviate so fundamentally from the dogma then being pursued by his peers? In fact, he had started to reconsider alternative positions five years earlier. Throughout the 1920s Le Corbusier aggressively defended straight lines, rectangular geometries and universal solutions in town planning. But after a visit to Brazil and Argentina in 1928 he started to embrace curved roadways. In 1929 Le Corbusier published sketches of what Curtis calls “quixotic urbanistic studies” for some existing cities, including Buenos Aires, São Paulo, Montevideo, and Rio de Janeiro (Figure 6). The common concept was that of housing beneath an elevated highway. Le Corbusier admitted that his proposal for Rio was “something completely radical” (1960: 124):

A second town of unprecedented form, carried on pilotis [nearly 40 metres] high with the lower groups of existing buildings radiating from each bay and passing beneath. And, [90 metres] up, a level motorway [25 metres] wide, linking all the hill tops, and creating order in the plan and townscape of Rio.

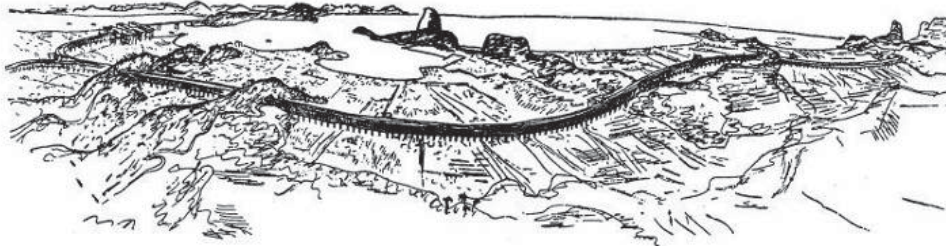


Figure 6
1929 – Rio de Janeiro (Le Corbusier 1964: 225)

The South American visit inspired an altogether less formal approach to both town planning and architecture. Also in 1929, both the holiday home for H el ene Mandrot near Toulon, as well as his proposed low-cost Loucheur Houses, abandoned Purist principles and combined industrial elements with natural stone. House Mandrot, in particular, responded to the local vernacular.

Boesiger and Girsberger in their otherwise relatively complete compendium entitled *Le Corbusier 1910-65* (1967) make no mention of the Barcelona Quarter, and neither do important authorities such as Charles Jencks (2000) or Maurice Besset (1992), onetime curator of the Le Corbusier foundation. It was nevertheless one of Le Corbusier’s favourite projects, described in both *My work* (1960: 110) and *The Radiant City* (1964: 306). Le Corbusier (1964: 306) himself reveals his intentions, writing that each house “constitutes living conditions similar to those in the country” (1960: 110) and that each should have a tree in front: “The quarter would then become a delightful oasis of refreshing greenery” (Figure 7).

Of the few authors who have referred to the Barcelona project, only William Curtis (1986: 116) commented that Le Corbusier “organised his dwellings as a tight-knit modern version of a Kasbah”. Was he, metaphorically speaking, referring tongue-in-cheek to racist Nazi propaganda posters that depicted the Wei enahofsiedlung as an Arab village (Jencks 2000: 185), or did he really recognise a connection based on Le Corbusier’s increasing attraction to vernacular forms and his admiration of Arab architecture? His assertion is tested by reviewing Le Corbusier’s well-publicized Algerian experience and analysing the design (Figure 8).

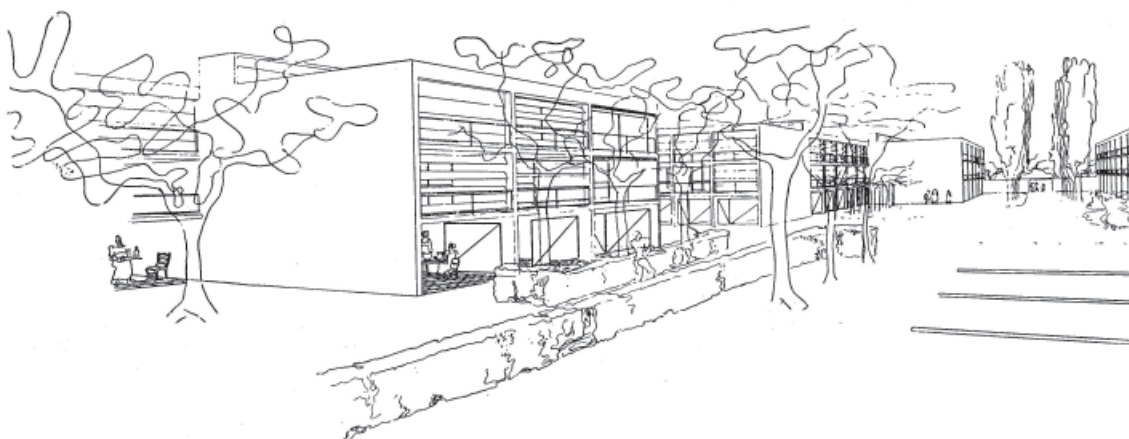


Figure 7
Barcelona residential quarter (Le Corbusier 1960: 110).

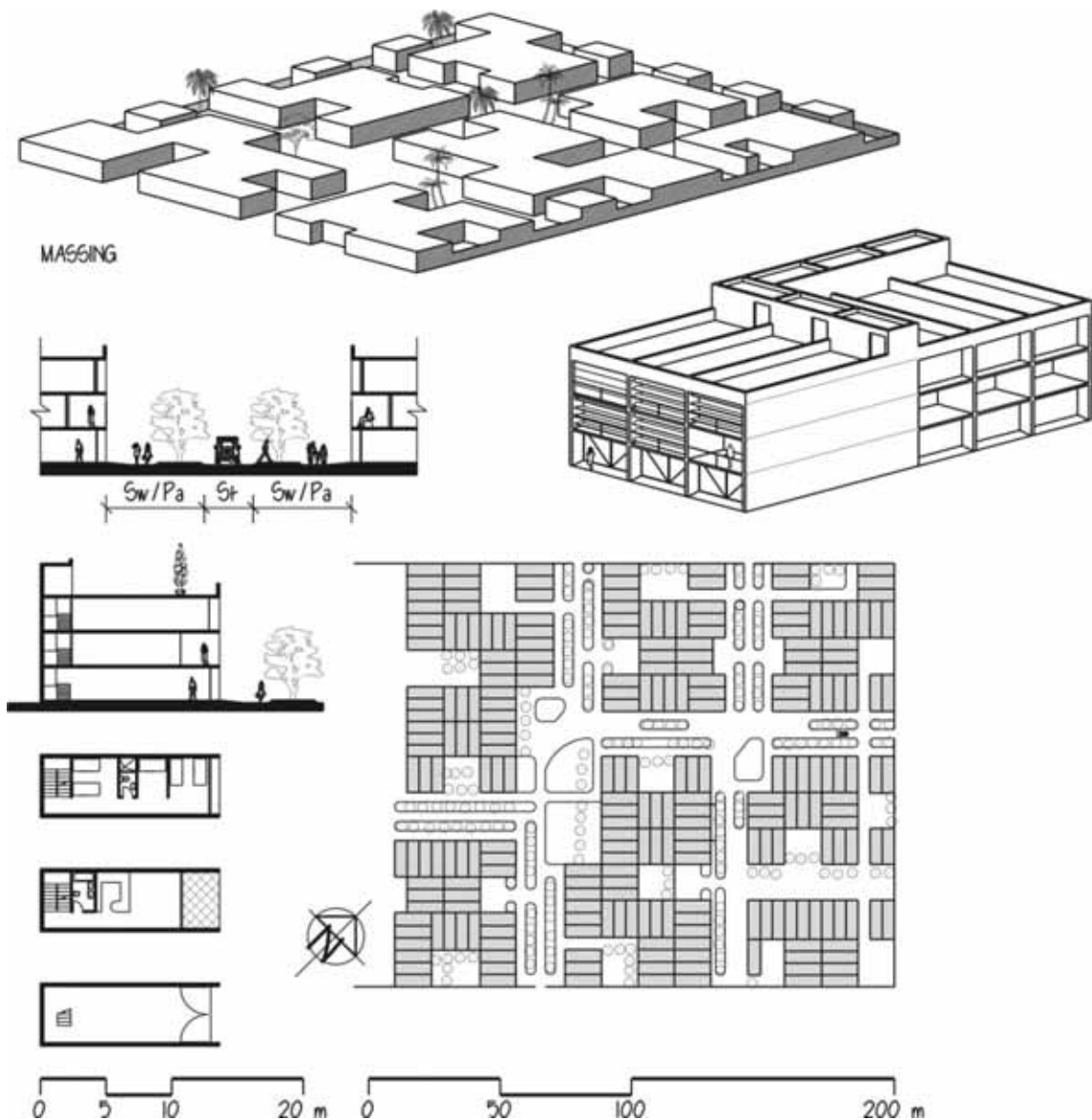


Figure 8
General layout (drawing by the author after plans in LC 1960: 110).

The great shift to contextual and vernacular sensitivity – Algeria

It was unquestionably his North African experience that prompted Le Corbusier to question the tenets that guided him through the 1920s. From 1929 to 1942 he visited Algeria a number of times and undertook a large number of projects, all regrettably unbuilt. During that time he visited the valley of M'zab in the Algerian desert (present day Mauritania), known for the plain, egalitarian architecture of its Ibadhite *ksour* (compact, walled villages). He asks (1964: 230):

Arabs, are there no people but you who dwell in coolness and quiet, in the enchantment of proportions and the savour [enjoyment] of a humane architecture?

Le Corbusier clearly became fascinated by these vernacular forms. Curtis comments (1986: 115-116):

Here he was captivated by the harmony between people, buildings and landscape, as well as by the ingenuity of the vernacular in dealing with local materials and the hot climate. The low houses blended with their natural setting and used shaded courtyards, ventilation holes, thick mud walls and careful orientation to keep out glare and heat.

And of a *ksar* in the M'zab, Ben-Isghem, Le Corbusier comments (1964: 231), “Such order, such decisiveness, such choice” (Figure 9). He made many sketches of courtyard houses and it is perhaps relevant to note Bianca’s claim that the Maghreb (Libya, Tunisia, Algeria and Morocco) “features the most consistent and the most formalised courtyard typology of domestic Islamic architecture” (Bianca 2000: 81). Although there are many regional variations, Arab-Islamic towns have been remarkably uniform and continuous.

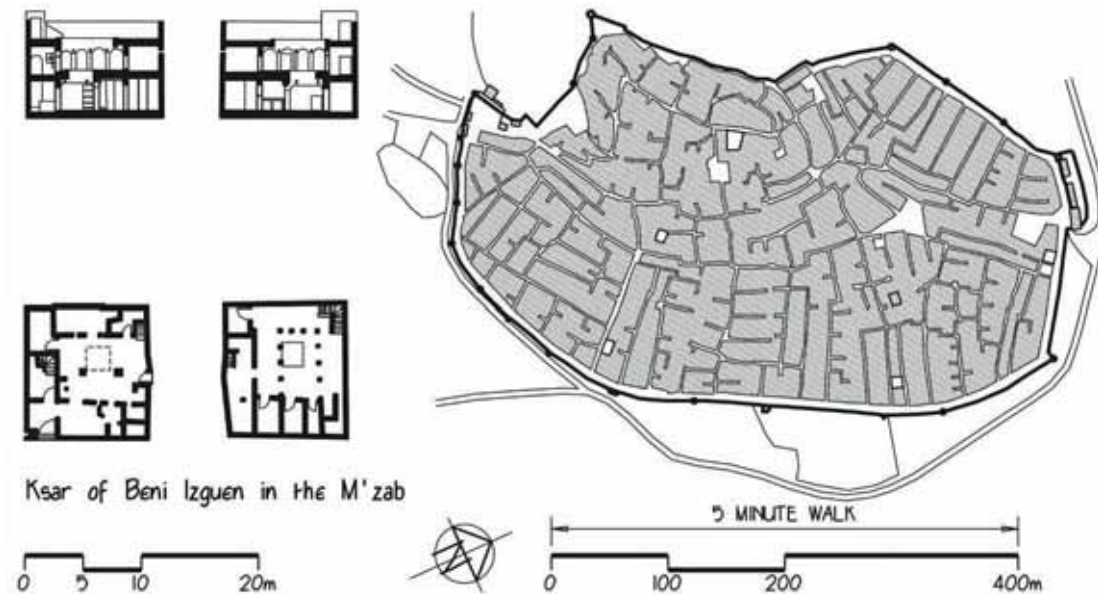


Figure 9
Plan of the ksar of Ben-Isghem in the M'zab, and floor plans and sections of a house in the settlement
 (drawing by the author after Guibbert 1982: 16, 19).

Apart from an appreciation of the vernacular and of courtyards, his observations had two other significant impacts on his design. First was the invention of the *brise-soleil*. Le Corbusier wrote that “... out of simple deference to imperative local conditions a North African architectural style appears ...” The Arab screened bay window (called *musharabiya* or *rawshan*) and Moroccan brick screens were now translated into a *brise-soleil*, and added to the free façade, but “its regionalism was not so much cultural as climatic” (Curtis 1986: 115-116):

Second is the entrenching of the *promenade architectural* as a planning element. Le Corbusier wrote (quoted in Risselada 1989: 60):

Arab architecture can teach us a great deal. It favours the act of walking; this is the means, by moving from one place to another, with which to experience the articulation of architecture. Here is a principle opposed to that of baroque architecture, whose conception was a theoretically determined centre. I prefer the lessons taught by Arab architecture.

The concept that could have evolved from the “long gallery” or promenade of an ocean liner, was subsequently explored in the staircase of House La Roche-Jeanneret (1923) (with its balcony overlooking the double volume of the living room) and was refined in the form of the ramp in Villa Savoye (1929). After the Algerian experience it emerged as a mature and consistent principle in individual buildings as well as urban entities, not simply as a circulation device, but as a means of enhancing the experience of moving through a building or through an urban space. It was certainly a design principle, but it was in fact a condition rather than a physical pattern.

Le Corbusier realised that vernacular type-forms were also rigorous, evolved through a process of adaptation and tradition, and he now searched for ways of “blending the substructures of the vernacular – their principles of organisation – with the rules of his own vocabulary” (Curtis 1986: 115-116). Le Corbusier’s diagrammatic sketch of Ben-Isghem is evidence of his

search for alignment, showing a much more formal layout than was actually the case (Figure 10). And nowhere is this “blending” more evident than in his Barcelona Quarter.

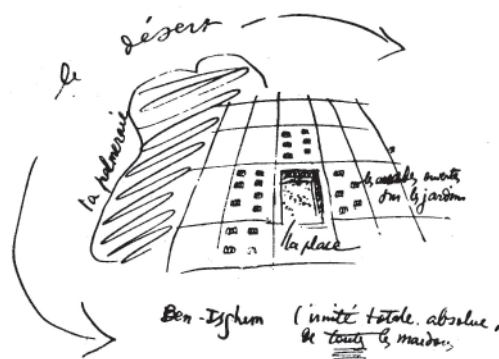


Figure 10
Le Corbusier’s interpretation of Ben-Isghem in the M’zab (Le Corbusier 1964: 231).

Design of the Barcelona residential quarter – the urban context

Early in his career Le Corbusier (1929: 170) formulated his Four Town Planning Principles: (1) the centres of cities must be de-congested, (2) density must be increased, (3) circulation and mobility must be improved, and (4) the number of parks and open spaces must be increased. Twenty years later, in *Concerning town planning*, he (1947: 116) sets out a refined theory he called “the doctrine of contemporary architecture” that is intended as “a lawful code of land utilization”. He presented it as an entirely pragmatic five-step urban strategy:

1. Establish a “sensible” scale for plans
2. Address requirements for sun, space and green
3. Determine building coverage
4. Determine density to reflect use and envisaged character
5. Determine the perimeter of the town.

These are the criteria I chose to investigate the project’s urban qualities. First, the urban scale. The Workers’ Quarter was part of an unexecuted master plan he designed for Barcelona, commencing in 1932. While Le Corbusier (1964: 307) proposed to preserve the historic buildings of the old city, he intended to reconfigure the existing 19th century street grid, based on the 113 x 113 m “Spanish square” (Figure 11), by consolidating nine such squares and surrounding the resulting neighbourhood-sized 400 x 400 m blocks each with a ringroad, a “grand avenue”. Each superblock would then be divided into six plots of 200 x 133 m. Significantly, while some “residential districts” would offer housing of the type under discussion, others would use the indented, raised slabs (also referred to as *redents*) Le Corbusier was so fond of, but never built (Figure 12). Normally these were planned as 12-storey buildings on *piloti* and with roof terraces. With the indented buildings he applied the urban principles he pursued throughout his professional career.

It is not known how many such quarters Le Corbusier proposed. His sketch of the superblock shows only one. Figure 13 illustrates a conjectural development of the block. The neighbourhood centre is from his design of Meaux in 1955 (Le Corbusier 1960: 188).

An assessment of the other four criteria is based on the comparative analysis and table summarising land-use intensity below (Figure 14). Since he was often severely criticised for over-providing public open space, what is the situation here? Alexander et al. proposes that a

communal square needs an occupation of at least one person per 28 m² to avoid being “desolate and dead” (1977: 311-314). A review of the aggregated open spaces shows that each household is allocated 14 m² in the Barcelona Quarter. In addition, each dwelling offers a 12.2 m² balcony and a 47.5 m² roof garden. None of these areas is excessive.

Building coverage of 54 per cent is much higher than Pessac’s 19 per cent, but somewhat lower than that of a Maghrebi town such as Fez, simply because provision for vehicles inside the estate necessitates streets rather than pedestrian lanes and alleys.

Le Corbusier’s emphasis on density brings us to the next criterion. The net density of 84 units per hectare is commendable. While units per hectare is never a helpful norm, because dwelling sizes differ so much that comparison is meaningless, population density is a consistent and more informative benchmark. Le Corbusier claims a density of 900 people per hectare (1964: 306), but I counted the beds and calculated 420.

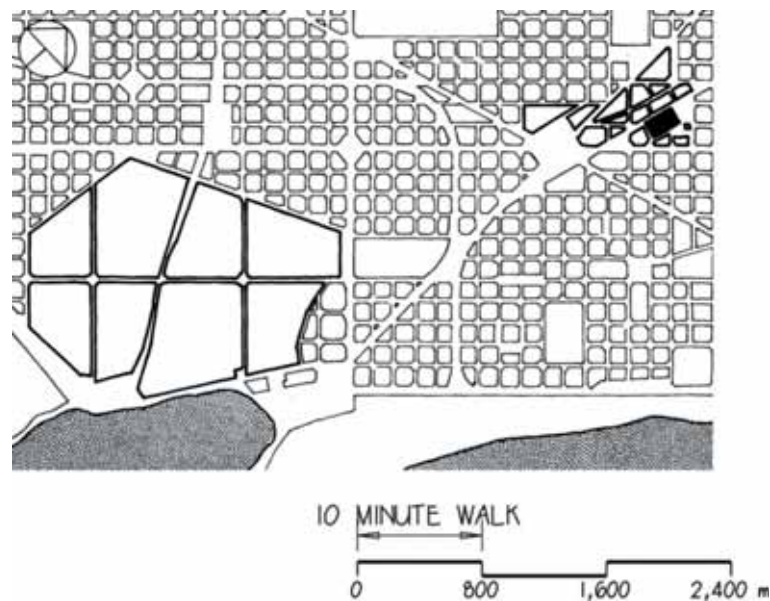


Figure 11
Morphological reduction of a fragment of Cerdà’s grid for Barcelona
(Source: Leupen et al. 1997: 175).

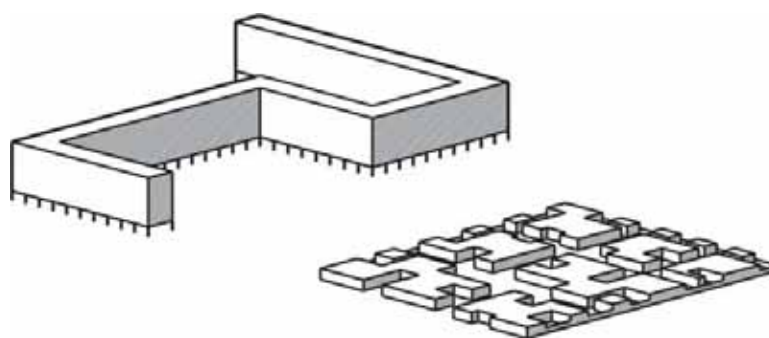


Figure 12.
The residential building typologies envisaged for Barcelona
(drawing by the author).



Figure 13
Urban framework (drawing by the author after Le Corbusier 1964: 306).

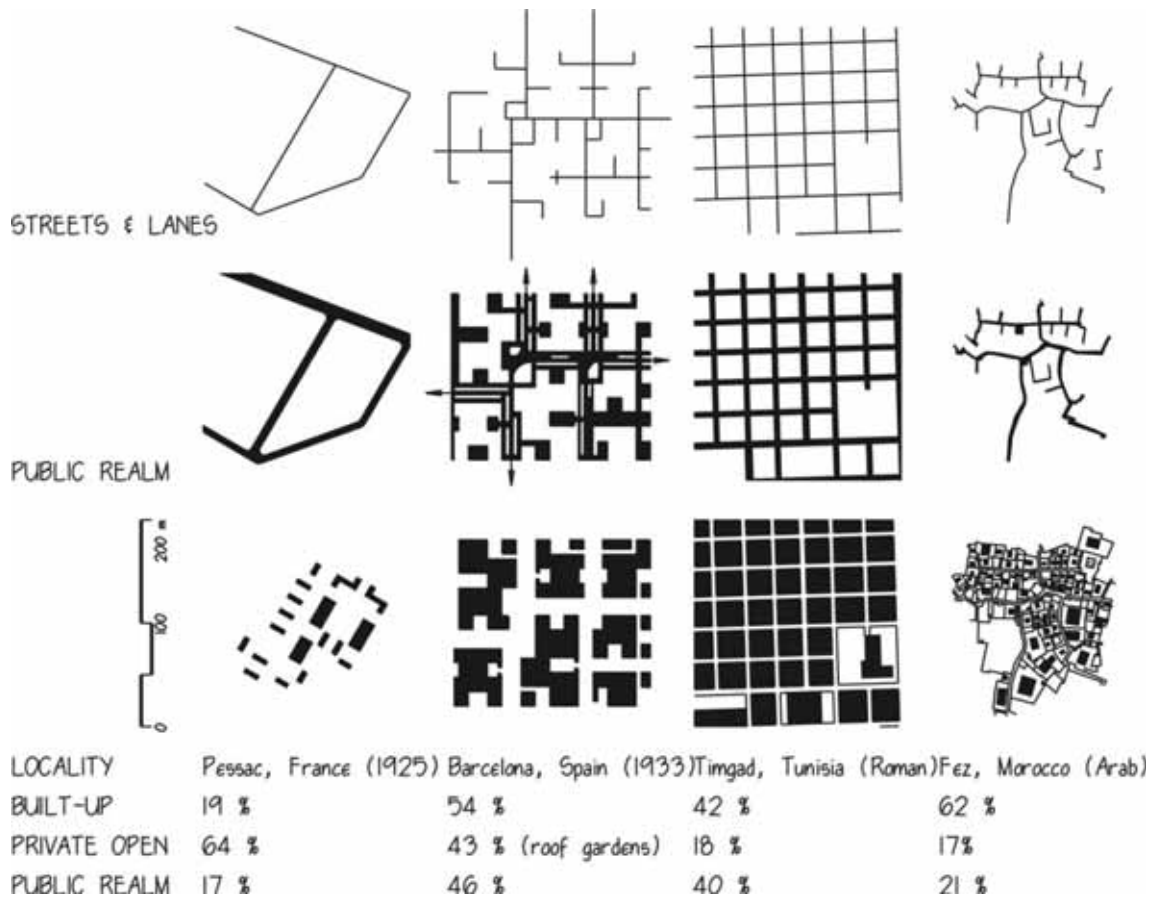


Figure 14
Comparative analysis (drawing and calculations by the author).

The last principle concerns settlement perimeter or edge. Although envisaged as part of a neighbourhood with access to commercial and communal services, the Barcelona Quarter is nevertheless conceived as an enclave – a gated community with five gateways. The external boundary consists of blank walls only, an introverted settlement exactly like a *ksar*.

Finally, considering his obsession with safe pedestrian environments and controlling vehicular traffic, the street layout is an important consideration. Barcelona’s street layout and unit clustering is based on a totally different doctrine compared to that of Pessac, a prevalent form to this day in the Western world. The units are attached side-by-side in rows and back-to-back, very much like the amorphous Arab settlement form. There are no front or back gardens. The dwellings line and define the interior streets and are tightly bunched around semi-private courtyards. Significantly these streets have centre lanes for moving vehicles, and parallel lanes for parking and pedestrians, as well as quiet communal spaces.

The fine grain is somewhat reminiscent of ancient Roman settlement in North Africa, a form familiar to Le Corbusier. But the quarter is not a permeable, connected grid. Rather, the tight aggregation of units and the configuration of streets, albeit wider than lanes and alleys, show the same hierarchical circulation pattern, including dead-end streets, as many of the Maghrebi towns that Le Corbusier visited.

Table 1
Land-use intensity (calculations by the author)

No. of dwellings	253
Site area	3,0 ha
Coverage	54 %
Dwelling density	84 units/ha
Population density	420 persons/ha
Dwelling footprint	60 m ²
Communal courtyards	12%
Public space	34% (streets, sidewalks and parks)

Dwelling unit design

Whereas Pessac offered a variety of designs, all based on a 4.9 metre module, Barcelona is composed of a single three-storey type measuring 4.5 m x 13.0 m, resulting in a 1:3 width-to-length ratio (Figure 15). Each is essentially “a basic cube”, like Villa Stein (1927), the second of Le Corbusier’s four compositional systems. He later called them “carefully weighed reflections on architecture” (1960: 82):

- | | |
|--|--------------------|
| 1. Picturesque and not difficult to handle | La Roche-Jeanneret |
| 2. Difficult to articulate a basic cube | Stein |
| 3. Problem simplified by incorporating other forms | Baizeau |
| 4. A positive architectural statement | Savoie |

Pessac was the quintessential Purist scheme (light, taut, industrial and universal), largely shaped by the Five Points of a New Architecture. Its form is punctuated by external stairways, verandas, pergolas and balustrades. Barcelona, on the other hand – although using a similar structural form – appears “heavier”, with only two articulations to the basic cube. First was the boxy stair-

house giving access to the roof garden, which had a plain parapet wall, rather than the metal railings at Pessac. Second was the front façade which was pushed back to form a balcony on the second level and overhangs on the first and third. Even the second and third level balustrades were much simpler than at Pessac, with only a metal pipe handrail and one upstand support in the centre. Here the brise-soleil is used for the first time, in the form of adjustable louvres. All later applications were fixed, concrete blades.

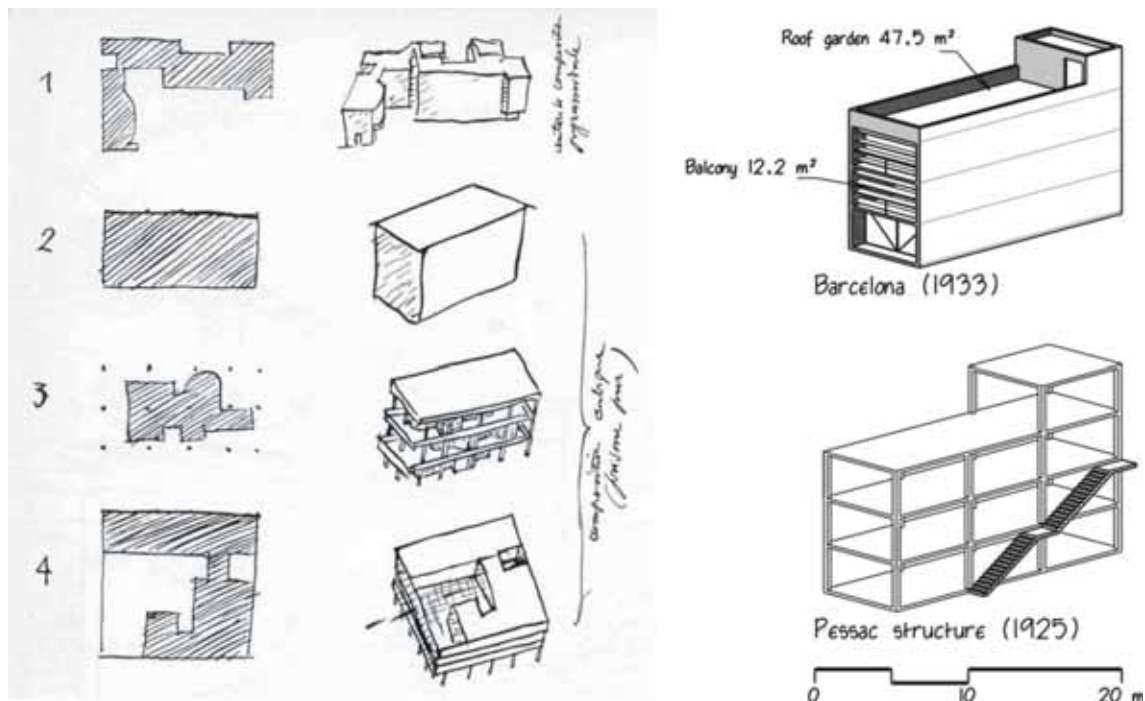


Figure 15

Left: The Four Compositional Systems, 1928 (Le Corbusier 1960: 82)

Top right: Articulation at Barcelona (drawing by the author)

Bottom right: Pessac structural configuration (drawing by the author).

Each unit had a single, unobstructed, 55 m² multi-purpose room at ground level that could also be used for a home industry (Figure 16). Private family rooms are located on the second and third levels and there is a roof terrace. It can be argued, speculatively of course, that the design is an abstraction of the Arab courtyard house. The small family shop facing the *suq* (Arab shopping street) was enhanced and given the whole floor. The privacy gradient, an essential aspect of the Muslim house, is now vertical, with living space on the second level and bedrooms on the third. The roof terrace, traditionally used for sleeping, had been retained. The central courtyard, however, had been sacrificed in favour of a balcony, screened by louvers – not for privacy though, but for sun control.

It is most likely purely coincidental, but the Indian shop-front building is literally even closer to the Barcelona concept (Figure 17). The example below is from Lamu, a World Heritage Site on the Kenyan Coast, where the type was introduced by Gujarati merchants during the second half of the 19th century. It is also found in Zanzibar and Mombasa. These shop-front houses are true ‘home-above, shop below’ types (Kiswahili: *uppar makan*, *niche dukan*) and most are still used as such today. Most feature four-leaf, bifold doors, also known as Gujarati doors, that open the shop completely for contact with clients. If the courtyard is pushed up to the roof level, if the staircase is inside the shop (as is often the case) and if a *rawshan* relates an upper-level living floor to the street, the typologies are absolutely identical.

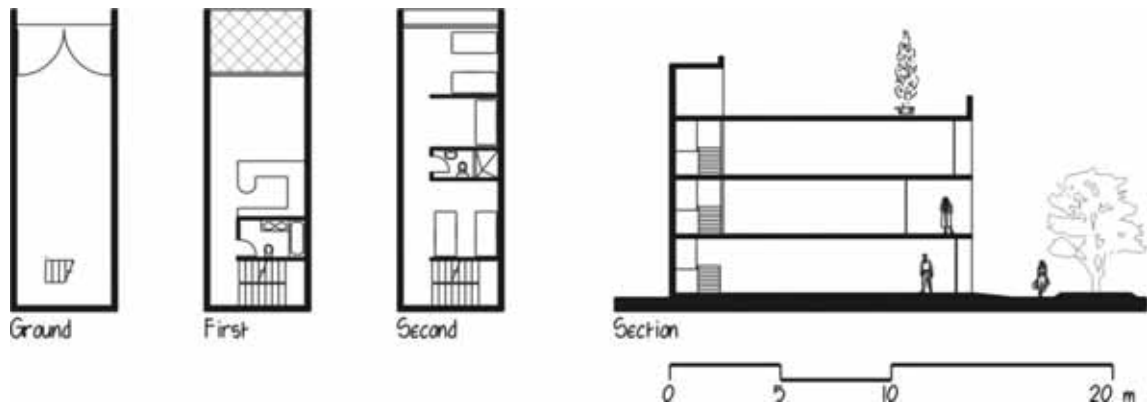


Figure 16
Dwelling unit plans and section (drawing by the author).

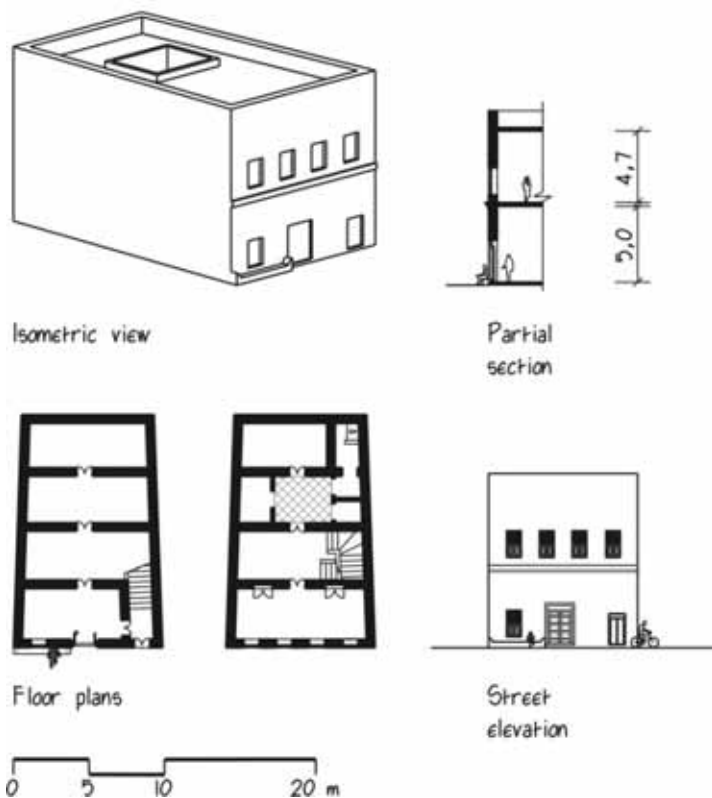
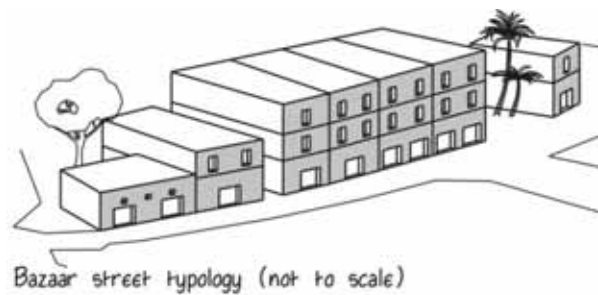


Figure 17
An Indian shop-front house in Lamu, Kenya
(drawing by the author after a surveyed plan in Siravo and Pulver 1986: 52).

During that time the French floor area norm for low-cost housing (one of the few European countries regulating public housing then) was 14 m² per person, with 45 m² units being most prevalent (Teige 1932: 67). The Barcelona units provided for five beds and a total enclosed floor

area of 154 m², or 99 m² if the ground level space is ignored, yielding 30.8 m² and 19.8 m² per person respectively – hardly economical.

There are other planning issues as well. It is not known whether the stairwell was intended to serve as a windcatcher (Arabic: *badgir*) or airshaft, but both cross-ventilation and natural light seem to be ignored. The lack of individual privacy on the bedroom level is certainly problematic.

Conclusion

From Bordeaux to Barcelona – Le Corbusier’s creative journey from Pessac to the residential quarter was profound but subtle. Whereas the former was shaped exclusively by the principles of Purism, in the Barcelona Quarter the structural form of a Pessac unit was retained but fused with vernacular North African building patterns, abstracted into rougher, hybrid concepts. Similarly, the circulation inside the quarter was based on the distinctive Arab pattern, but adapted to facilitate the movement of vehicles. The configuration of his shared streets is much more sophisticated than found in any of his town plans, an approach predating the New Urbanism by nearly 40 years. In his unbuilt but enormously influential ground-level residential carpet schemes after Barcelona, La Sainte-Baume (1948) and Roq-et-Rob (1949) on the French Coast, the Mediterranean vernacular would be much more explicit, an approach that culminated in Maisons Jaoul in 1954.

Just as the French Coast projects evolved parallel to the Unités d’Habitation, so was the Barcelona Quarter conceived in the shadows of massive, winding, indented housing strips. But while the Barcelona Quarter was essentially a one-off project, the *redents* were, in fact, the most recurring and enduring of his housing typologies, and they were integral in numerous fruitless proposals, from the Contemporary City in 1922 to the proposed Reconstruction of the centre of Berlin in 1961.

After Pessac Le Corbusier never built another ground-level, multi-family scheme. It is, therefore, puzzling that when he was offered the opportunity in Chandigarh in the early 1950s, he declined. He undertook the urban planning for the first residential sector and laid down the design guidelines for the row houses clustered around semi-public and semi-private parks and courtyards, but the designs were created by others (Pierre Jeanneret, Jane Drew and Maxwell Frey).

It can only be concluded that Le Corbusier transformed his method from Pessac to Barcelona in response to very specific contextual, climatic and socio-economic requirements. He retained the pragmatic application of vernacular principles and applied them much more boldly in later schemes. His proposal to redesign Barcelona’s street grid was patently unfeasible and he missed an opportunity to demonstrate competence in designing low-cost housing. Le Corbusier nevertheless convincingly conceptualised a compact, mixed-use, pedestrian-friendly alternative to conventional row and cluster housing. The Barcelona Quarter was based on a promising concept that has not been fully explored – truly an unfinished project.

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