

From the traditional Ottoman house to the apartment building in the Kasbah of Algiers: Adaptations and typological mutations

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Abstract

During the French occupation, the historic urban fabric of Algiers, the Kasbah, went through many interventions, fragmentations and destruction. A field study conducted within the boundary of the historic core shows the existence of dwellings built or modified during the colonial period. The PPSMVSS study named these dwellings “traditional houses”, “remodelled traditional houses”, or “colonial houses built over Ottoman remains”, but no information is given about the remodelling work or the type of the Ottoman remains. This article traces the evolution of the housing typology in the Kasbah from the traditional Ottoman family house to the apartment building. The aim is to identify the evolution, adaptation and transformation process of traditional housing typologies. A sample of 180 houses located in the historic core was selected. This study investigates, identifies and compares the different housing typologies. It reviews and compares the housing morphological characteristics of both the Ottoman and the colonial periods. The results confirm the existence of two types of colonial houses with different spatial organizations and different construction techniques, materials and ornamentation. The first type, the rental shared house, reproduces the Ottoman housing typology and marks the first stage in the transformation of the traditional family house. The second type, the apartment building, preserves an organization around a central space, but it introduces many changes within the characteristics of the “traditional house”. It appears from this study, that the interaction between the two cultures has generated an indigenous form, a hybrid architecture, mixing traditional Ottoman architecture and colonial architecture.

Keywords

Colonial architecture, Housing typology, Hybrid architecture, Morphological characteristics, Transformation process.

1. Introduction

This article traces the evolution of architectural typologies within the historic core of the Kasbah of Algiers, ranging from the traditional structure of Ottoman family homes to that of European residential buildings, prevalent in France during the 19th and early 20th centuries. Within this historical nucleus, the residential fabric has undergone urban stratification, progressing from the Ottoman period to the French colonial era, and subsequently to the post-colonial period.

The medina of Algiers was built on the Roman ruins of Icosium, upon which the Arabo-Berber settlement of *Djaza'ir Bani Mazghanna* [1] flourished, founded by the Zirid dynasty in the 10th century. From the 10th to the 16th century, the city endured the shifting dominions of contenders vying for control of the central Maghreb. Initially, it served as a minor port under the governance of successive Arab dynasties that held sway over North Africa. In 1516, responding to an appeal from the *Cheikh al-Balad* (Chief of the Council of Notables of the city), the *Barberousse* brothers liberated the city from Spanish presence and embargo. By 1519, Algiers had become the premier vassal city of the Ottoman Empire in North Africa. Under Ottoman rule (15th - 19th century), the medieval city of Algiers transcended its humble origins as a mere village with a minor port, burgeoning into a dynamic urban center [2] (Çelik, 1997; Missoum, 2003). Within its fortified walls, residential quarters, palaces, mosques, hammams, caravanserais, barracks, and numerous other edifices thrived.

Algiers was invaded by the French in 1830, thus becoming a French colony for 132 years until its independence in 1962. During this period, the historic center underwent significant transformation, with its ramparts being relocated and ultimately demolished. Countless projects, whether realized or not, reshaped its urban fabric, architectural character, and residential typologies [3].

The “houses” or more precisely, the residential structures erected or modified during these three significant his-

torical phases that have shaped the city of Algiers, are currently integrated into the present-day safeguarded sector of the Kasbah of Algiers [4]. [Figure 1-c].

To date, no comprehensive study on the various typologies of housing within this historical center has been undertaken. Numerous studies have focused on the traditional Ottoman-era house, also known as the Moorish house [5], highlighting different spatial organizations, construction systems, and decorative aspects (Atelier Casbah, 1981; Giovanetti, 1992; Missoum, 2003; Abdessemed, 2007; Lamani Bourahla, 2011 & 2018). Regarding the colonial period, research is both scarce and recent. Some monographic studies (Driouèche, 2002; Touaright, 2003; Bué-Vidal, 2012; Piaton, 2018) have focused on the early manifestations of French architecture by analyzing transformations, alterations, and adaptations made to prestigious Ottoman-era buildings, highlighting the adaptation of these local architectural organizations to new uses and European aesthetic codes.

Additionally, a few comprehensive works and research on colonial productions in Algiers have provided some data on the first French buildings within the limits of the Kasbah of Algiers. Attilio Petruccioli, based on the historical phasing of the evolution of the “colonial” city of Algiers and French urban and architectural regulations, provided the first typological study on Algiers’ rental buildings constructed between 1830 and 1930 (Petruccioli, 1993). The buildings located along the first French breakthroughs in the urban fabric of the pre-colonial city, specifically the streets of Bab El Oued and Bab Azoun, are thus integrated into the first period corresponding to a military regime from 1830 to 1880 (Lespes, 1930).

Studies primarily focused on identifying the architectural trends and styles of the early colonial rental buildings (Baba Ahmed-Kassab et al., 2004; Bacha, 2012; Piaton et al., 2016) have attributed neo-classical and eclectic variations to these same buildings located in the lower Kasbah.

Moreover, typo-morphological analyses (Oukaci, 2009 & 2022; Baba-Ahmed et al., 2013; Bernou, 2014)

that covered buildings constructed between 1830 and the centenary of the French occupation in 1930 have documented and described the spatial and distributive organizations of buildings along the early colonial breakthroughs (Bab El Oued, Bab Azoun, and Rue de Chartres). These studies have also facilitated the identification of adaptation strategies employed in integrating Haussmannian architectural models into the Algerian context. They reveal that the uniqueness of Algiers' apartment building architecture lies precisely in its interactions with the morphology and topographic constraints of the site, urban form, and various construction methods. Thus, it is through these relationships that we can accurately locate and evaluate the originality of local variations in Algerian apartment building architecture (Cherif, 2017).

Finally, recent works focusing on the topographical, urban, and architectural study of Bab El Oued and Bab Azoun streets, as well as the expropriation, concession, and remodeling of plots along the main routes resulting from colonial developments (Hadjilah, 2014 & 2016 & 2020), have revealed, among other things, the existence of a "cultural hybridization." This is manifested through the transfer of models from the metropolis and their adaptation in the colony "Algiers." Additionally, instances of juxtaposition and hybridization of locally constructed buildings from the Ottoman era have been identified.

All these studies have focused essentially on colonial production along the main axes resulting from the various interventions and structuring of the urban fabric of the Ottoman-era city by the colonial occupation. The "punctual" colonial buildings inscribed in the pre-colonial urban structure of the upper part of the town, the subject of this article, have not attracted the interest of researchers. We find certain data in the study of the safeguard plan of the protected sector of the Kasbah of Algiers.

Indeed, The development of the Permanent Safeguard and Enhancement Plan for the safeguarded Sector (PPSMVSS) [6], based on a thorough analysis of several works conducted to date on the historical center of the Medina

of Algiers, has resulted in the creation of a graphical map titled "Map of Global Typologies." This map identifies and locates different housing typologies within the Kasbah (CNERU, 2012). Concerning the Ottoman period, the document outlines four major types of houses, with three of them having already been defined in previous studies (Atelier Casbah, 1981; Missoum, 2003). It concerns the traditional house called the « *patio* » [7], the traditional house called « *chebbek* » [8], the traditional house called « *Aloui* » [9] and the fourth typology corresponds to « *la maison traditionnelle remaniée* » (the traditional house modified). It is worth noting that in Ottoman-era archival documents, the term "house" is designated by three terms: *al-dar*, *al-dwira*, and *al-âlwi* [10].

For the colonial period, this plan distinguishes between the "colonial building" and the "colonial building on remnants" (constructed on an Ottoman substrate). The typology known as the "colonial building" is assigned to all residential buildings, regardless of the type of spatial and distributive organization. Furthermore, both colonial typologies mentioned above have been identified within the various fabrics that constitute the urban structure of the safeguarded sector of the Kasbah of Algiers.

Indeed, the study of the PPSMVSS of the Kasbah of Algiers has defined three types of fabric within the current boundaries of the protected area [Figure 1]: a first fabric labeled 'traditional,' representing the urban organization from pre-colonial times (during the Ottoman era), primarily located in the upper part of the city known as "El djebel" [11] [Figure 1-b]: Above the last colonial breakthrough (Randon Street, now Amar Ali-Abdaji Abderahmane Street), a second fabric referred to as 'mixed' is situated in the area known as "El Djebel". Here, the urban structure from the Ottoman era coexists with colonial urban structures resulting from various alignments, expansions, or openings of pathways. This section is located between Bab el Oued – Bab Azoun Street and la Lyre Street. The third fabric, termed 'colonial,' represents areas where colonial

intervention is significant, destroying the Ottoman substrate. It is found in the lower part of the city, 'El Outa,' between Bab el Oued- Bab Azoun Street and the sea, as well as in areas located on the former ramparts of the Ottoman city. Finally, for the post-colonial period, the term 'recent construction' is attributed to all buildings constructed from 1962 to the present day.

However, a field study, specifically in the area known as "El Djebel," with its two urban fabrics, "traditional" and "mixed," has revealed the existence of particular and atypical dwellings. When not classified within the so-called traditional typologies or colonial buildings, most of them have been designated, in the study of the PPSMVSS (CNERU, 2012), as "remodeled traditional buildings" or "colonial buildings on remnants," without specifying the

nature of the alterations (spatial, constructive, or aesthetic) or the nature of the Ottoman substrate.

It is worth noting that the uniqueness of these dwellings lies in the fact that they develop on plots with a shape identical to that of the first French cadastre dating back to 1868 [Figure 2]. This plan provides a representation of the land divisions from the Ottoman era before the significant transformations of the second half of the 19th century.

The spatial configuration of these dwellings resembles that of traditional houses, featuring a systematic organization around a central space while incorporating characteristic elements of the colonial period. They embody examples of hybrid domestic architecture, where the predominance of traditional features coexists with colo-

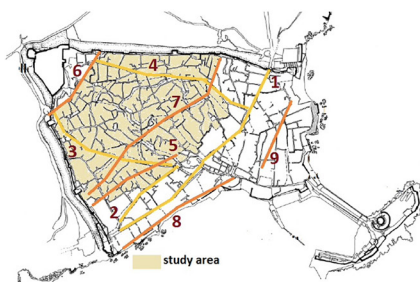


Figure 1-a. The main transformations of the old Algiers fabric
The 1830s road layout plan of Algiers Medina (atelier Casbah)

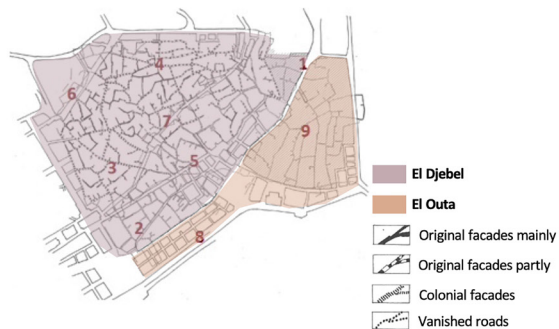


Figure 1-b. Road layout plan
(Atelier Casbah)

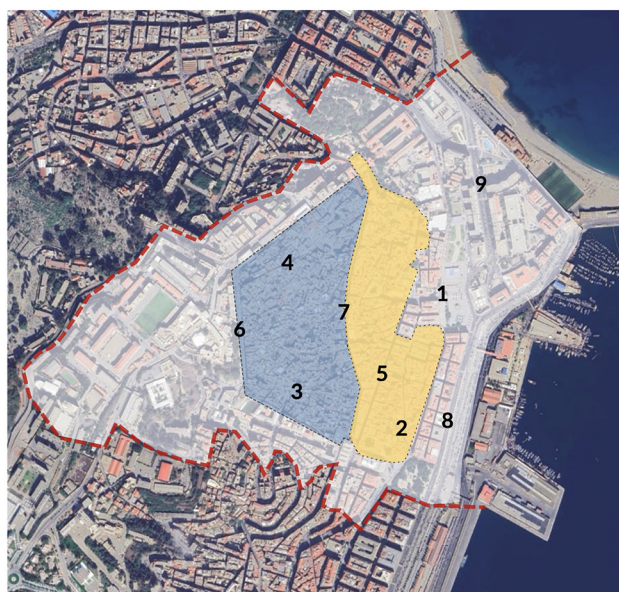


Figure 1-c. Aerial picture of the Kasbah of Algiers

- Urban fabric « traditional »
- Urban fabric « mixed »
- Urban fabric « colonial »
- Limits of the safeguarded sector of the Casbah

Road alignment and widening

- 1- Bab el Oued Bab Azoun Street
- 2- De Chartres Street
- 3-Porte neuve Street
- 4- La Casbah Street (sidi Driss Hamidouche).

Road Openings

- 5- De la lyre Street
- 6-De la victoire Boulevard
- 7-Randon Street.
- 8- De l'impératrice Boulevard
- 9-1st novembre Boulevard.

Figure 1. Historical and topographic context.

nial influences. Moreover, they attest to a gradual transformation from the traditional Ottoman family house to a shared rental dwelling and eventually to a rental building commonly referred to as an «apartment building / *immeuble de rapport*,» specific to the colonial period.

We hypothesize that during the extensive infrastructure projects of the 19th century, colonial buildings were not only erected along the newly developed thoroughfares but also within

plots dating back to the Ottoman era. The spatial organization of these structures evokes local architectural elements and spaces. The objective of this article is to discern the gradual evolution, adaptation, and transformation of the architectural, structural, and ornamental features of these dwellings. It delves into the process of both adapting traditional typologies and integrating new forms that align with the European model of apartment buildings. Therefore, this study aims to inves-



Figure 2-a : Algiers Cadastral plan of 1868. High section

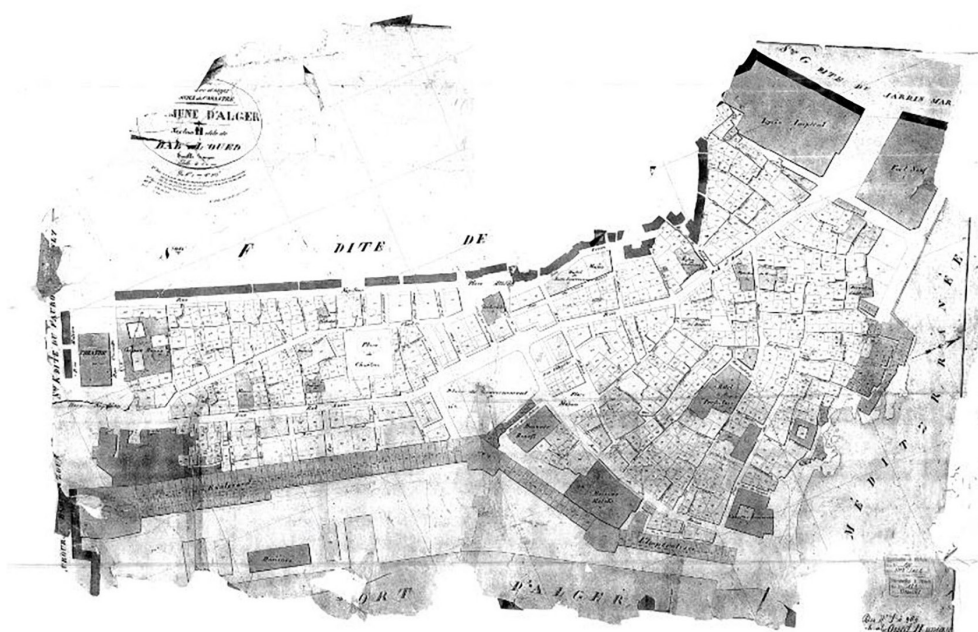


Figure 2-b : Algiers Cadastral plan of 1868. Lower section

Figure 2. Algiers Cadastral plan of 1868.

From the traditional ottoman house to the apartment building in the Kasbah of Algiers: Adaptations and typological mutations

tigate, identify, and compare various housing typologies situated within the historic core of the Kasbah. It scrutinizes the morphological characteristics of housing during both Ottoman and colonial periods. The data collected are subsequently juxtaposed with the local spatial organization, structural configuration, and architectural ornamentation of housing.

2. Methodology and case study: Dwellings in the interstices of urban history

In the context of a thesis focusing on the critical analysis of the content of the PPSMVSS study of the Kasbah of Algiers and the development of a rehabilitation manual for the residential built environment of this protected area, we conducted a planimetric examination of a sample consisting of 274 buildings (houses and residential buildings), distributed across all three fabrics comprising the historic center of the Kasbah of Algiers.

Data collection took place over several years, running parallel to multiple university research projects initiated in 2010. This included personal surveys as well as documents collected from a

number of consultancy firms that took part in drawing up the PPSMVSS study and which, between 2006 and 2020, were able to gain access to a number of homes showing various levels of deterioration requiring urgent work [12].

The study of these buildings enabled the proposal of a typological classification attempt, distinguishing between main-secondary typologies and their variants.

Thus, 94 structures have been classified into a first category (Category A), corresponding to the Ottoman period. They exhibit two main typologies: the first, represented by the “*Wast ed-dar*” house [13] (Category A-1), which further branches into three secondary typologies, and the second corresponds to the “*Alwi*” house [14] (Category A-2) [Figure 3].

180 structures have been classified into a second category (Category B), corresponding to the colonial period. They reveal two main typologies: those that have “appropriated” the architectural typologies of the Ottoman period (Category B-1), also presented in several secondary typologies, and those that replicate a metropolitan reference model (Category B-2) [Figure 3].

historical period	Ottoman period			French (colonial) period			
	Architectural typologies of the Ottoman period. category A			Architectural typologies of the French period category B			
Main types	"Wast ed-dar" house (category A-1)			Home without "wast ed dar" "Alwi" house (category A-2)	Architectural typologies that have "appropriated" the architectural typologies of the Ottoman period (category B-1)		Architectural typologies that replicate a metropolitan reference model (Category B-2)
Secondary typologies	The palace category A-1-1	House in Wast ed dar "open" category A-1-2	House in Wast ed dar "closed" with <i>chebek</i> category A-1-3	House without <i>wast ed dar</i> <i>Alwi</i> category A-2)	Architectural typologies that have "reproduce" the architectural typologies of the Ottoman period category B-1-1	Architectural typologies that have "transform" the architectural typologies of the Ottoman period category B-1-2	Apartment building with distributor staircase category B-2-1 Apartment building with distributive central courtyard. category B-2-2 block of dwellings with covered passage. category B-2-3 blocks of apartment buildings « Barres du 1 er Novembre » category B-2-4
Study sample	94 structures			274 structures			
				47 %		180 structures	
						53%	

Figure 3. Typological classification.

The dwellings classified in Category B-1 have caught our attention for several reasons. Far from representing a low percentage compared to this typological classification, they are developed in the area called “*El Djebel*,” on plots identical to those in the 1866 cadastre. Erected on parcels of various dimensions, they are located on streets, alleys, and dead-end streets whose layout dates back to the Ottoman period. They present, at times, facades typical of the Ottoman period but also with colonial-style facades, featuring rows of unadorned openings—a treatment of facades widespread, particularly in France, between 1840 and 1860 (Boudon, 1988 ; Hadjilah, 2016).

In contrast to the dwellings situated along the main axes of urban restructuring in the Ottoman city, which have garnered significant attention from researchers due to various factors, this scattered architecture punctuating the residential fabric in the upper part of the city remains largely unexplored, often conflated with either Ottoman or colonial residential typologies.

Indeed, when compared to the comprehensive typological map established within the framework of the PPSMVSS study, these buildings classified in cat-

egory B encompass all architectural typologies defined by the National Center for Applied Studies and Research in Urban Planning (CNERU) , including traditional buildings, renovated traditional buildings, colonial structures, and colonial buildings built on existing remnants. This realization underscores the importance of examining these houses, whether renovated or constructed during the colonial era, as their study could unveil novel insights into hybrid residential typologies and shed light on the architectural history of colonial Algiers.

Thus, the study presented in this article focuses on the entirety of the sample from category B, comprising 180 buildings, the majority of which are located within the fabric known as the “traditional” area, situated between La Lyre Street and La Victoire Boulevard. This area has predominantly preserved its pre-colonial urban layout, distinguished by its densely packed fabric [Figure 4].

The period of colonial intervention in this area, remains somewhat unclear. Often associated with the formation and development of Algiers, the urban evolution of the historic center of the Kasbah of Algiers still remains hypothetical.

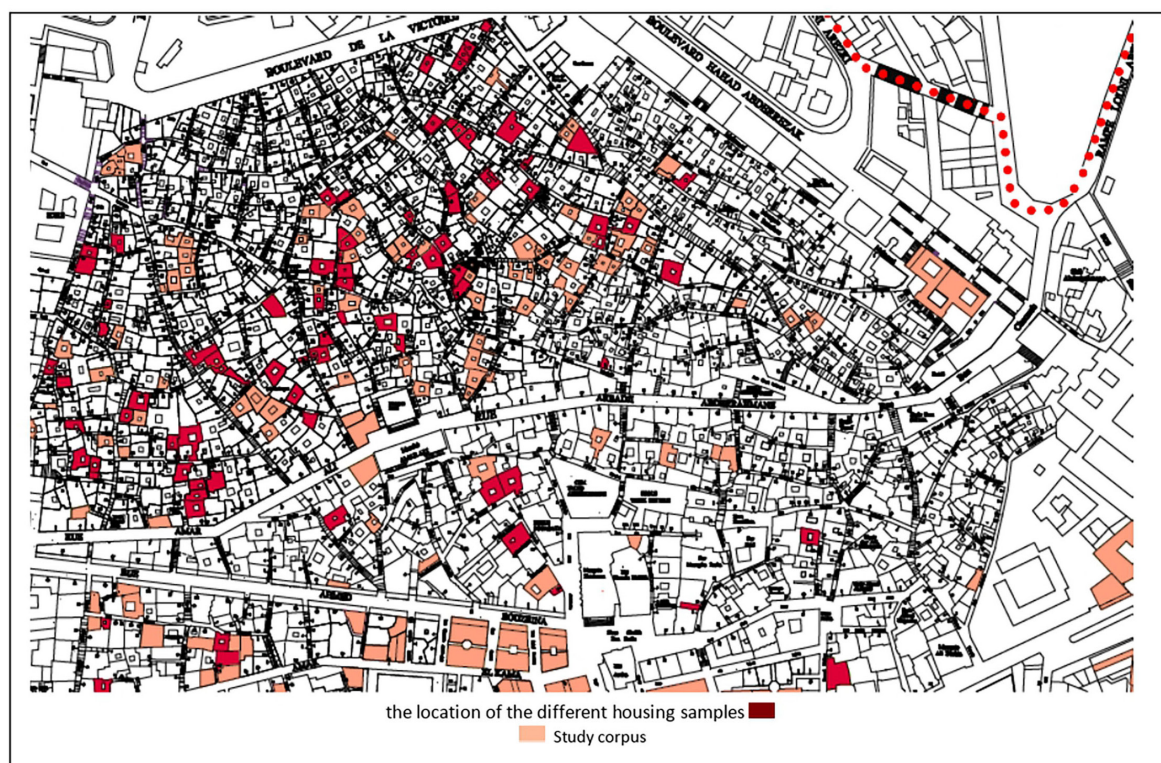


Figure 4. Current plan of the safeguarded sector of the Kasbah.

From the traditional ottoman house to the apartment building in the Kasbah of Algiers:
Adaptations and typological mutations

However, the PPSMVSS study (CNERU, 2012) presents a scenario that places the transformations and constructions above La Lyre Street in the initial phase of the city's development, spanning from 1830 to 1880. Transformations located above Randon Street are classified in a second stage of development between 1880 and 1930. The construction of la Lyre Street dates back to the second half of the 19th century, more precisely to the year 1854. (Piaton (dir), 2016; Piaton & Lochard, 2017). The Randon Street, designed by Guiauchain, was started in 1862 in the direction of the synagogue. Its extension would only be realized in the last years of the century. The general plan of the city of Algiers established by O. Mac Carthy in 1892 shows the development of only a part of the Randon Street to the west of the square bearing the same name "Randon Place", the largest part, on the eastern side, is represented in dotted line, specifying that it is in project and not yet completed. The Boulevard of Victoire, which encircles the residential area on the upper side, dates from the same period as Randon Street. It was completed before the end of the 19th century. We find its layout on the plan of Algiers-Mustapha, established in 1888 as well as on the General plan of the City of Algiers, established by O. Mac Carthy in 1892.

From all this data, it's clear that from the second half of the 19th century onwards, the part called "*El Djebel*" is restructured of bottom in top. Also, the constructions registered in this zone of study, seem to go back to the second part of the 19th century for the part included between the la lyre street and street Randon, probably towards the beginning of the 20th century for the part located above street Randon on the Eastern side of the place which bears the same name.

The analysis of spatial, structural, and decorative data from this study sample reveals that 47% of these dwellings, whether newly constructed or remodeled during the colonial period, preserve the authenticity of traditional typologies characteristic of the Ottoman era. This preservation occurs through a typological process that can

be described as "reproduction," "adaptation," or "transformation."

The examination of the samples highlights two distinct patterns of spatial organization. On one hand, there is the shared rental house, which not only emerges on former Ottoman remnants but also reproduces the typology of the Ottoman-era "*wast ed dar*" house. On the other hand, there is the new rental building, which also features a central organization and is erected on a plot dating back to the Ottoman era. The typological process of the transformation, from the traditional courtyard family house to an apartment building, is enclosed within these two spatial organisation schemes.

3. The first mutation: From the traditional family house to the rental shared house

The family structure within the traditional context takes on an extended character (Stella, 1980). The traditional Ottoman-era house serves as a "residence" for an extended family. Constructed on plots of varying dimensions, it is intended to accommodate an extended family. In this arrangement, each nuclear family occupies a room with a single door, ensuring what R. Bescloîtres and L. Debzi have termed a second-degree intimacy (Stella, 1980). However, the *Wast ed dar* (courtyard) and spaces reserved for kitchens and latrines are communal.

The first category of colonial houses marks the initiation of the transformation from a family house to a shared rental house, housing unrelated families. This shift is a response to the high demand for housing among local residents in the upper part of the city. The progressive European occupation of the lower part of the city led to the expropriation of numerous indigenous properties (Aumerat, 1897; Ouahes, 2006; Hadjilah, 2016 & 2019; Piaton & Lochard, 2017).

While the exact number of houses affected by requisitions remains to be evaluated, various authors (Chassériau, 1858; Aumérat, 1897) have warned about massive destruction and abusive expropriations since the early days of occupation. J.F. Aumérat notes that

".... in 1842, real estate in the city of Algiers and its suburbs was largely owned by the state and Europeans, whereas in 1830 we found it almost exclusively in the hands of Muslims...." (Aumérat, 1897). Studies and research focused on reconstructing the urban structure of the demolished and restructured areas during the colonial period have confirmed this situation (Raymond, 1981; Hadjilah, 2014 & 2019).

Consequently, the natives of the pre-colonial city found themselves gradually displaced from the lower part of the city, compelled to seek refuge in its upper regions. As specified by Farouk Benatia in his study on Algiers, "*the Algerian population is mainly entrenched in a single district, 'the Casbah,' designating the part called 'el djebel'*" (Benatia, 1980). Additionally, the increase in the population residing in the old Medina of Algiers is a significant factor in this transformation of the traditional house (Benatia, 1980). According to Djaffer Lesbet, the population growth and proletarianization in the old Medina of Algiers doubled during the colonial period [15] (Lespès, 1935; Lesbet, 1985). This situation led native people to share their houses by renting rooms, as explained by Farouk Benatia: "*....The upper rooms are occupied by the owner of the house, the lower rooms are rented*" (Benatia, 1980). While the functional and spatial configuration of the traditional house was preserved, some adaptations and transformations were carried out in certain parts of the house, primarily the rooms and the urban façade.

3.1. Appropriation of the traditional house model: Conserving spatial and functional configuration

This first category of colonial houses replicates the traditional model, incorporating the foundational forms and structures of old Ottoman houses, particularly evident in the basement, the courtyard (*wast ed dar*), and the plot's layout. The spatial organization reproduces the so-called Ottoman period model (Atelier Casbah, 1981; Missoum, 1993 & 2003), specifically that of the house with a *wast ed dar*, whether open or closed by a *chbek*.

This model revolves around three

different spaces: the chicane entrance (*Sqifa*), the courtyard (*wast ed dar*) and the rectangular rooms (*buyt*, pl. of *bayt* in the ground floor and *Ghuruf*, pl. of *Ghurfa* on the upstairs) [Figure 5]. The entrance to the house is through the space known as "*Sqifa*," acting as a transitional buffer between the public space (street-alley) and the private space "*.... If the door is the boundary between the outside world and the interior world, the 'squifa' is the passage between these two worlds*" (Noweir & Depaule, 1979). It stands as an architectural solution designed to safeguard the privacy of the family nucleus amidst urban life.

This space presents itself with various configurations and arrangements. In grand residences, the "*Sqifa*" takes the form of a large room adorned with tiles and furnished with benches delineated by small columns topped with arcades. It serves as a gathering place for men, where the head of the household receives male visitors and neighbors can convene. The size of this room decreases depending on the size of the plot and the residence until it becomes a smaller space with two openings, never positioned directly opposite each other. The first opening corresponds to the entrance door of the house, while the second leads into the interior of the home [16].

Depending on the size of the plot, the *wast ed dar*, whether square or rectangular, is delimited by one, two, three, or four arcades and extends on two, three, or four sides, where galleries called "*Shin*" are attached, followed by rooms.

One side of the house is partially or entirely dedicated to service spaces (latrines-storage spaces, known as *Sedda* in the rational house), primarily featuring the staircase connecting the different levels. The side hosting this "service block" is typically arranged on the narrower wing, which consequently doesn't allow for the creation of a spacious rectangular room with an ideal length three times its width [Figure 6]. This setup represents the most common layout of the traditional room: a tripartite spatial organization (Missoum, 2003). This room consists of three subspaces. The central space, equipped with the entrance door, is

generally deeper, as it features a recess in the back wall just in front of the entrance, referred to as *Qbou*. The two lateral spaces are marked by niches usually arranged in front of the windows framing the entrance door

This organization, which has attracted the interest of several researchers [17], Concerning its origin and sym-

bolic significance, imparts a inverted "T" configuration to the room (Mismoum, 2003; Lamani Bourahla, 2011). [Figure 6].

Although this first category of colonial houses maintains an introverted organisation, using the spaces and layout of the traditional house described above [Figure 5], the transition to the



Figure 5. The layout of the first category of colonial houses illustrating the shift from the model of the traditional family house to the rental shared house.

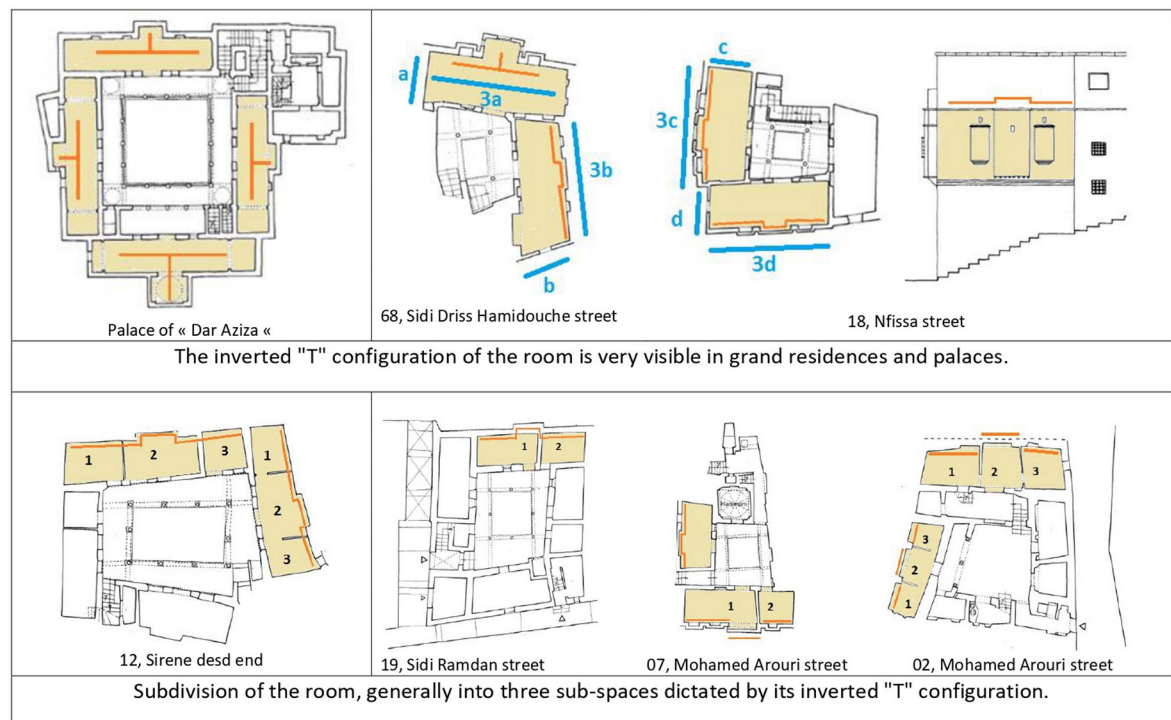


Figure 6. The inverted "T" configuration of the room.

cohabitation of different families imposes a code of conduct that ejects the “man” from the house and generates transformations both in the use of certain spaces and in their architectural configuration.

In Mohamed Dib’s novel «the Big House / *La Grande Maison*,” vivid descriptions illuminate the daily routines of families inhabiting shared dwellings within the Kasbah of Algiers. Here, men are notably excluded: “...go. Men are not meant for the house...” (Dib, 1952), the whole house is a woman’s place.

Within this context, the “*Sqifa*,” traditionally a space for male reception within the ancestral home undergoes a transformation into a transitional area for “men.” They must seek permission through the “*Triq*,” patiently awaiting the departure of women from the *Wast ed dar* and galleries, thereby facilitating passage (Lesbet, 1985) “... As men traverse the “*wast ed-dar*,” the female domain temporarily contracts, only to expand once more once the man reaches his room or corner...” (Noweir & Depaule, 1979). Similar to the traditional family residence, the *Wast ed dar* (courtyard) remains the central hub of the dwelling, a distinctly feminine domain where women engage in various activities, including circulation, daily living, work, and social interactions. “.....This was the center, indeed the “principal room,” the setting for the “theater of work and women’s leisure, for children’s games.... Some houses had water fountains here...” (Çelik, 1997).

The galleries “*s’hine*,” serve as periodic extensions of the rooms, each room possessing its unique *s’hine*. Their usage is strictly regulated, serving as storage spaces for movable items during specific times of the day, especially preceding the return of the “men” (Lesbet, 1985).

The rectangular-shaped room transforms into the “family dwelling,” accommodating all daily activities. As Farouk Benatia notes, “...the Moorish house is proletarianized, and each room can house an average of 4 to 6 people belonging to a family” (Benatia, 1980). However, this space undergoes gradual spatial modifications, influencing the architectural language of the external facade over time.

3.2. Buyt and Ghuruf’s adaptation: towards a multifunctional use

Minor spatial modifications are evident in this initial category of colonial houses, notably observed in the subdivision of rooms, commonly referred to as “*bit*” or “*ghurfa*,” arranged around the *Wast ed dar* [Figure 5]. Each of these rectangular rooms, transformed into an “room dwelling / *pièce apparteme*” (Noweir & Depaule, 1979), is occupied by a different family and undergoes various changes in use throughout the day. The central space is utilized as a reception area, while the lateral spaces serve multiple functions, including a living area, kitchen, dining room, and resting chamber. In the evening, it transforms into a spacious bedroom for the entire family (Noweir & Depaule, 1979).

Moreover, its subdivision, typically into three subspaces dictated by its configuration in the form of an inverted “T,” allows for the arrangement of distinct rooms capable of accommodating various functions. [Figure 6] As explained by Nora Semmoud, in this communal house where each different family, without necessarily having any kinship ties with the other families inhabiting the same residence, occupies a room, “...appropriation will consist of lifting constraints related to forced cohabitation with strangers, managing space scarcity, and protecting multiple intimacies within the same family by compartmentalizing rooms or even the sole room/dwelling” (Semmoud, 2007).

Rooms that are not subdivided into multiple subspaces are often inhabited by owners who typically occupy at least two large rooms on the upper floor.

3.3. The urban facade’s new language

In the traditional house, the external façades, facing outwards towards the street, are usually blind and are often referred to as austere and monotonous. The architectural language is expressed through the different overhangs on the facade (Lamani Bourahla, 2018). Conversely, the rental house’s external facade includes windows [Figure 7].

Living with different families brings about notable changes and adjustments in domestic practices and the functioning of the typical traditional

house model. The entrance door and windows of living spaces that opened onto the galleries and the *Wast ed dar* cannot remain permanently open, contrary to the practice observed in the traditional house. This arrangement, initially intended to ensure continuous lighting and ventilation of these spaces, must be modified due to the need to close the door and windows to preserve privacy. In this context, creating openings towards the urban space emerges as an ideal solution, as the layout of the rooms allows. The niches, arranged on either side of the central space receiving the *Qbou*, are thus transformed into windows, often framing a third

window arranged at the level of the *Qbou* itself [Figure 7].

These new openings become a means of ventilation and natural lighting for the room or rooms. Thus, in this colonial model, two distinct systems of ventilation and lighting coexist. The first relies on the *Wast ed dar* (courtyard), which ensures the natural ventilation and lighting of the house, while the second is materialized through the openings integrated into the external facade. This latter feature reflects colonial architectural principles. These new windows, arranged on the external facades, are equipped with a simple grating formed by the intersection of

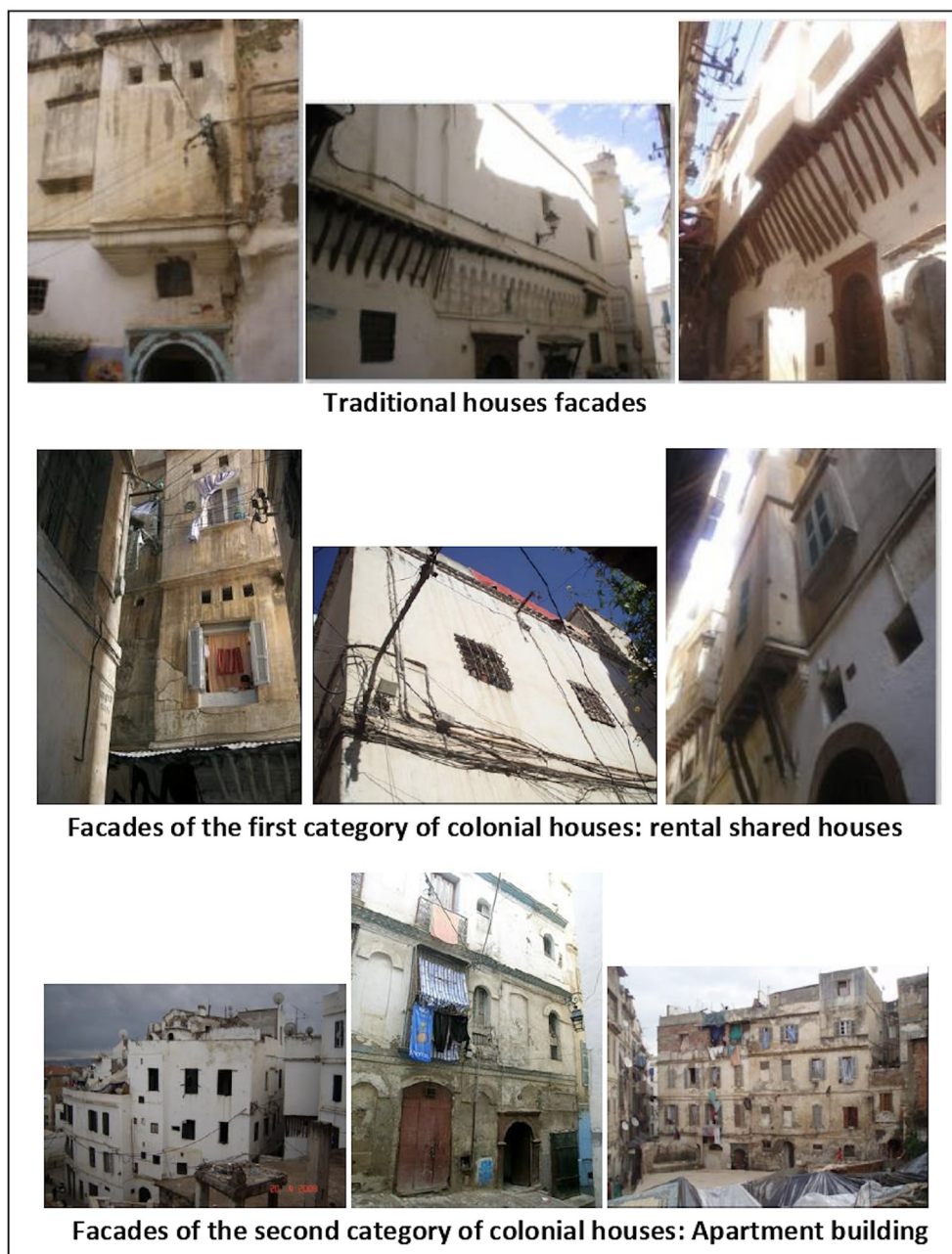


Figure 7. Treatment of exterior facades.

several horizontal and vertical bars. A layout reminiscent of the fahs houses, beyond the ramparts, from the Ottoman era. [18]

4. Second mutation: From the shared house to the European apartment building, a change in typology and use

Although it emerged during the 17th and 18th centuries (Bertrand, 1980), the tenement building became the dominant urban form in France in the 19th century and the first half of the 20th century (Moley, 1991; Bonneval & Robert, 2013). It is presented as a very large building with several floors, each occupied by a tenant (Boudon, 1988).

Loïc Bonneval and François Robert specify that this type of building embodies, especially from 1850 onwards, an organization in which the occupying property is very much in the minority, most of the inhabitants being tenants in buildings held by rentier owners.

The emergence of these new collective buildings in the Ottoman city is noted from the beginning of the 19th century, on the first French breakthroughs or during the operations of alignments and widening of the roads.

Recent studies on the apartment buildings, built from the beginning of the 19th century within the limits of the safeguarded sector of the Kasbah, have identified two main architectural typologies: a residential type with an arrangement of space around either a single-staircase or a courtyard (Petruciolli, 1993; Oukaci, 2009; Hadjilah, 2014 & 2019; Bernou, 2014).

The residential type with an arrangement of space around a single-staircase might have emerged from the 18th century's storey house in Marseille, called the "three windows - *trois fenêtres*" (Hadjilah, 2016). Whereas, the residential type with a courtyard arrangement is rare in metropolitan cities (Picard, 1994), and cannot be considered as imported. For example, Aleth Picard mentioned that this type stands for the concern expressed throughout the colonial period, to understand Moorish architecture and town planning and to refer to them for climatic, seismic or aesthetic considerations (Picard, 1994).

The transition to the construction of rental buildings in the upper part of the city responds to the scarcity of land combined with a strong demand for housing in this only district reserved for the indigenous population, thus favoring the development of co-ownership. Djaffer Lesbet evokes a phenomenon of "ghettoization" and "snacking" of the Kasbah, by substituting local houses with apartment buildings (Lesbet, 1985). He explains that, unlike in the past, urban planning regulations and new architectural norms resulting from the 19th-century hygienist movement forbid native landowners to appoint master masons "*Maalem*" to rebuild their houses. Instead, they had to hire an architect. However, the lack of means for most of them led to the falling down of their houses and their sale as "building lots".

These "building lots" are taken over by foreign owners, who aim to build apartment buildings with a maximum floor area ratio (Lesbet, 1985), to make the investment gainful. In its origin, the apartment building was the optimal solution to maximize a full space and plot use (Hendel & Filali, 2019). These new buildings are built in the upper part of the city and are occupied by Algerian families (Lesbet, 1985).

The main similarity between this second model and the Ottoman housing typology is the presence of a central space. However, this "reproduction" is far from being faithful to the "traditional" model, many adaptations, transformations, juxtapositions and evolutions are clearly noticeable. These denote a progressive mutation of the shared house to the apartment building.

This mutation was followed by a series of transformations noticeable in the space activities, the form and the size of the rooms, the size of the house as well as the composition of the urban facades.

4.1. The new function of *Wast ed dar*: A distribution and ventilation courtyard

The *wast ed dar*, a central space characteristic of traditional dwellings, is surrounded by galleries ensuring peripheral circulation and the distribution of various rooms arranged on each side. The apartment buildings,

the subject of this second category of colonial houses, also present a central space, which is not systematically surrounded by galleries. The latter sometimes distinguishes itself by a geometric configuration different from that associated with the traditional *wast ed - dar*. Indeed, the triangular shape, geometrically equivalent to half of a square or a triangle, is very present in these apartment buildings. [Figure 8].

This arrangement suggests an optimization of the layout of rooms at the expense of an increasingly reduced central space, whose function evolves from that of a traditional, *wast ed dar* to that of a courtyard for ventilation and lighting. The elimination of certain galleries and the direct opening of rooms onto this central space further reinforce the observation of the mutation of the *wast ed dar* into a building courtyard performing the same functions as the courtyard in European apartment buildings [Figure 8]. “...*The courtyard has been devalued, no longer being a place of social practices and becoming an increasingly minimal void relegated to a function of ventilation and often poorly-assured lighting, or even an area of more or less controlled storage*” (Moley, 1999).

The mutation of the *wast ed-dar* into a simple courtyard is not only functional but also architectural. Indeed, some galleries surrounding the courtyard often have an architectural configuration that is different from that observed in the traditional typology. The finesse and lightness of the walls, consisting of marble or tufa columns supporting semi-circular arches, characteristic of galleries surrounding the “*wast ed dar*” space, are frequently replaced by earth brick pillars or opaque walls with doors and windows.

Moreover, these galleries frequently incorporate stairs intended to ensure the vertical distribution of the various floors composing the residential building. Thus, unlike the configuration observed in traditional houses, the staircase becomes, at times, visible, juxtaposed with the courtyard and galleries.

4.2. Fragmentation of the tripartite room

In the traditional house, and in the most favorable situations with a large plot, each side of the central space (*wast ed dar*) accommodates a rectangular room arranged lengthwise and a second room arranged widthwise, following a helical pattern: the interior walls support each other perpendicularly, providing the structure with resistance to horizontal and seismic loads [19] (Missoum, 2003). In this second category of colonial houses, the tripartite rectangular room undergoes fragmentation, giving way to a succession of square or rectangular rooms of smaller dimensions [Figure 8]. On each side of the central space, a considerable number of rooms is arranged, reaching up to three or four rooms on each side of the courtyard, which generally corresponds to the number of rooms typically developed on an entire level in a traditional house.

Thus, the arrangement of a high number of rooms seems to be the priority, potentially at the expense of a central space reduced to its smallest size or geometric form, typically in the shape of a triangle. This comes at the cost of the number of galleries surrounding the central space as well. They are reduced to two, or even just one gallery, responsible for distributing the rooms [Figure 8].

The various tenants of these “new buildings” no longer occupy a room subdivided into several spaces, but rather a set of rooms, fulfilling all the functions necessary for a family residence, including those traditionally assigned to the *wast ed dar*. Moreover, some rooms constituting a “dwelling” are sometimes interlocked, giving the configuration of a small apartment [Figure 8].

4.3. Reconceptualizing the architectural composition of urban facades in the new paradigm

These new colonial residences, established on parcels dating back to the Ottoman period, stand out for significant vertical expansion. The two conventional levels identified in the traditional house are replaced by a structure consisting of four to six habitable levels [Figure 8]. Each

floor accommodates an average of eight to ten rooms, arranged as small apartments.

The terrace level of the traditional house, initially featuring a single room known as the “*Menzeh*”, has also been converted into multiple rooms like the other levels of the house. However, unlike the flat roofs specific to the traditional house, some terrace rooms are covered by sloping roofs, supported by wooden trusses. This configuration recalls the roofs of the early colonial buildings located along the Bab el Oued-Bab Azoun Street.

The numerous rooms arranged around the central courtyard seek air and light through the courtyard as well as through urban spaces. A new logic of architectural composition of street-facing facades emerges, adopting the model of tenement buildings with large windows and shutters arranged in a row, their number corresponding to the rooms along the central space facing the street [Figure 7 & 8]. However, in contrast to the residential buildings located along the main thoroughfares of the city, such as Bab el Oued - Bab Azoun Street, De Chartres Street, Ran-

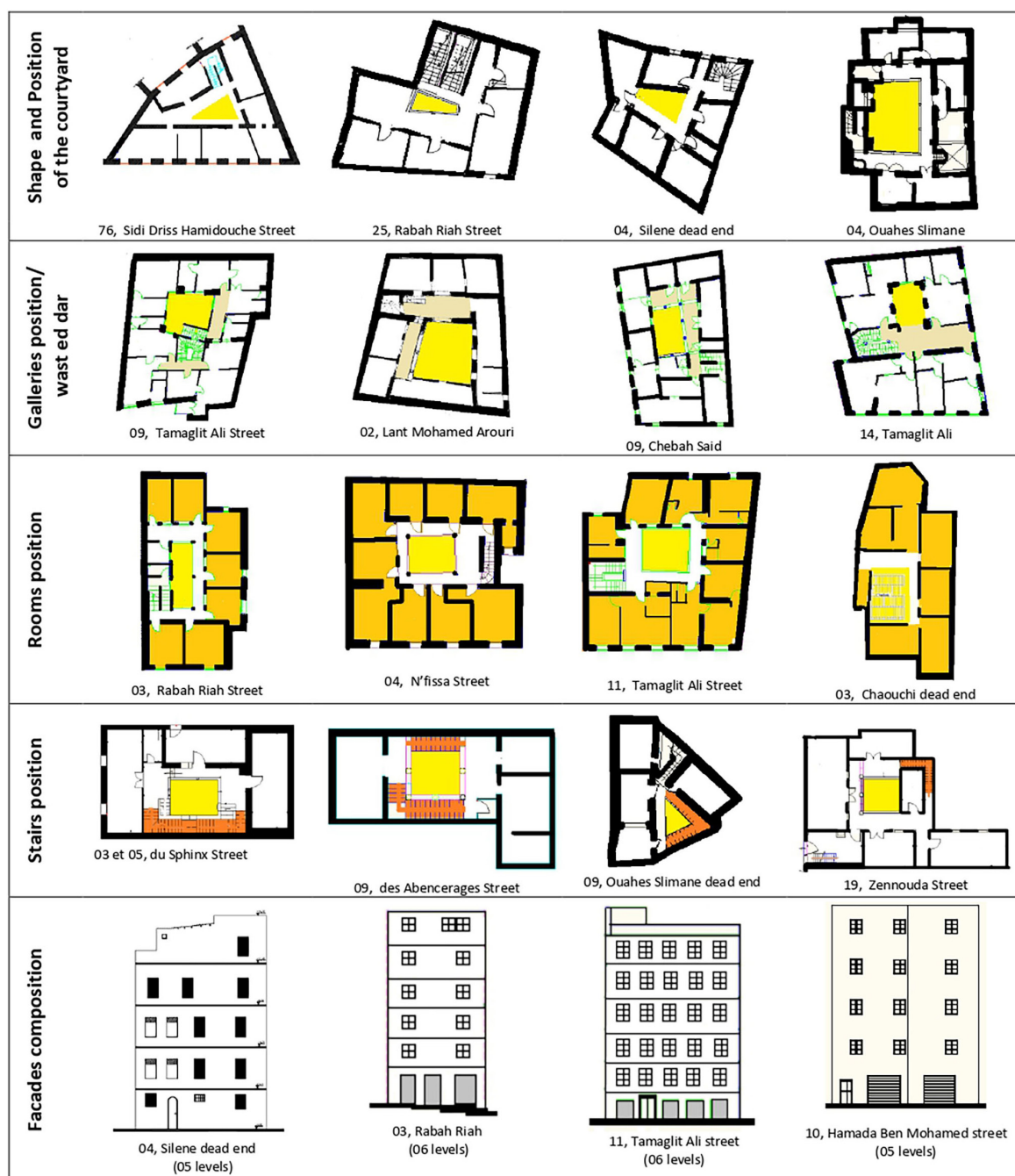


Figure 8. The layout of the second category of the colonial houses «Apartment building».

From the traditional ottoman house to the apartment building in the Kasbah of Algiers:
Adaptations and typological mutations

don Street, and Impératrice Boulevard, which were intended for the European population, none of the buildings documented in this upper area of the city feature balconies opening to the exterior. Rooms without openings to the urban space are illuminated and ventilated by windows facing the central courtyard. These windows are also equipped with shutters. It is noteworthy that the central space, transformed into a courtyard, is considered an exterior space, much like the urban space

5. Evolution in construction and decorative techniques

Like the 19th-century colonial buildings, the case study houses showcase a diverse array of materials and construction techniques, representing an extensive evolution marked by adaptation, renewal, transformation, and innovation.

In the initial category of shared colonial houses, a noticeable blending and integration of materials and construction systems from both Ottoman and colonial periods are evident. This early stage in the evolutionary process implies that these houses were owned by local families who reconstructed their homes during the French occupation. However, the shift towards the European apartment building extensively incorporates European building systems and materials. As part of this transformation, the materials and elements traditionally used in the interior decoration of houses undergo a gradual process of substitution, abandonment, or reinterpretation.

5.1. The juxtaposition and association of old and new construction systems

The rental colonial house maintains the structural scheme of the traditional house: a rigid system (Abdessemed, 2007) of load-bearing walls and a flexible system composed of a series of arches (Raveraud, 1989; Abdessemed, 2007). The vertical structures are made with the same materials used in the Ottoman period. The walls of the basements and the ground floor are built with a mixed bond of stones and bricks, assembled with earth and lime mortar. The stones, either blue or yellow (limestone: tufa),

have different dimensions and are roughly cut [Figure 9].

The other walls are usually built with solid bricks laid flat and joined together by a thin layer of earth and lime mortar. This brick bonding constitutes a second step in the building construction technique during the second half of the 19th century (Chergui, 2011; Cherif, 2013).

The horizontal structures encompass various floor types; the traditional thuja log floor, a floor made of cedar wood planks and a vaulted floor. Also, whenever basement floor levels exist, barrel vaults or cross vaults constructed during the Ottoman period cover the ceiling. The occurrence of this variety of horizontal structures in the same building attests to the evolution of the building construction techniques of the colonial period. During this period and until the end of the second half of the 19th century, the building construction techniques found in situ were carried over. Then the thuja logs were replaced by wooden joists with rectangular sections, a maximum span of 5 metres and spaced 60 to 80 cm apart (Cherif, 2013).

Later on, towards the end of the second half of the 19th century, these wooden floors are replaced by a building construction technique imported from the metropolis: floors made of brick vault and steel joists type IPN [Figure 9].

5.2. Progressive pre-eminence of the European imported construction systems

The apartment buildings are characterized by the pre-eminence of the European imported construction systems. The walls located on the lower floors are of mixed masonry, like those of traditional houses, whereas the load-bearing walls on the upper floors are of solid brick bond, either red based on clay or yellow based on lime [Figure 9].

Inside the house, many room partitions are of ceramic brick with nine holes joined by cement. This material specific to the colonial period is also found in wall covering. (Chergui, 2011). In most cases, these apartment buildings have vaulted ceilings, but occasionally they also have floors resting

on wooden joists. Here, the priority is given to the habitable area, rather than the gallery and the central space. The use of this new material results from the arrangement of large rooms, exceeding the maximum span of thuja logs.

Similarly, this structural device is used for the construction of the stairs, whether they are inscribed in one of the sides surrounding the central space or in the galleries. The rooms located on the terraces are covered by a sloping roof, made of wooden truss and red-coloured tiles. This new type of roof covers the colonial houses of the first period of the colonisation, along the Bab el Oued-Bab Azoun Street.

5.3. Ornamentation and aesthetics expression: Between reinterpretation and rejection

In general, the shared house aesthetic and decorative characteristics preserve the aesthetic code observed in traditional houses, while gradually replacing the traditional materials and architectural elements.

The terracotta earthenware tiles, which once enhanced the arcades of the *Wast ed dar*, the basements of the walls and the window frames are replaced by cement tiles, made by French

workshops in Algiers, like Louis Castan manufactory (Seguy, 1930).

Of different sizes, shapes and patterns, these cement tiles are also found as floor coverings in place of marble and terracotta tiles used in the homes of the Ottoman period. The use of cement tiles led to changes in the logic of the distribution of architectural ornament (Aissaoui, 2011 ; Zeghar, 2012). In fact, the frieze that frames the arches of the *Wast ed dar* is made up of two rows of four earthenware tiles to form the geometric or floral pattern. But with the larger cement tile, a single tile is sufficient to fill the width of the frieze [Figure 9]. Similarly, the iron balcony railings of the colonial buildings were used inside the building, replacing the galleries' wooden railings "*Darbouz*" [Figure 9].

A major transformation is noticeable in the apartment building: the uses of the central space and the galleries have changed and the interior façades that delimit them were stripped of all decoration.

Indeed, the central space is no longer a living space hosting various activities of the house, it is transformed into a distribution courtyard ensuring the lighting and ventilation of the habitable rooms. It becomes, consequently, a space outside the houses.

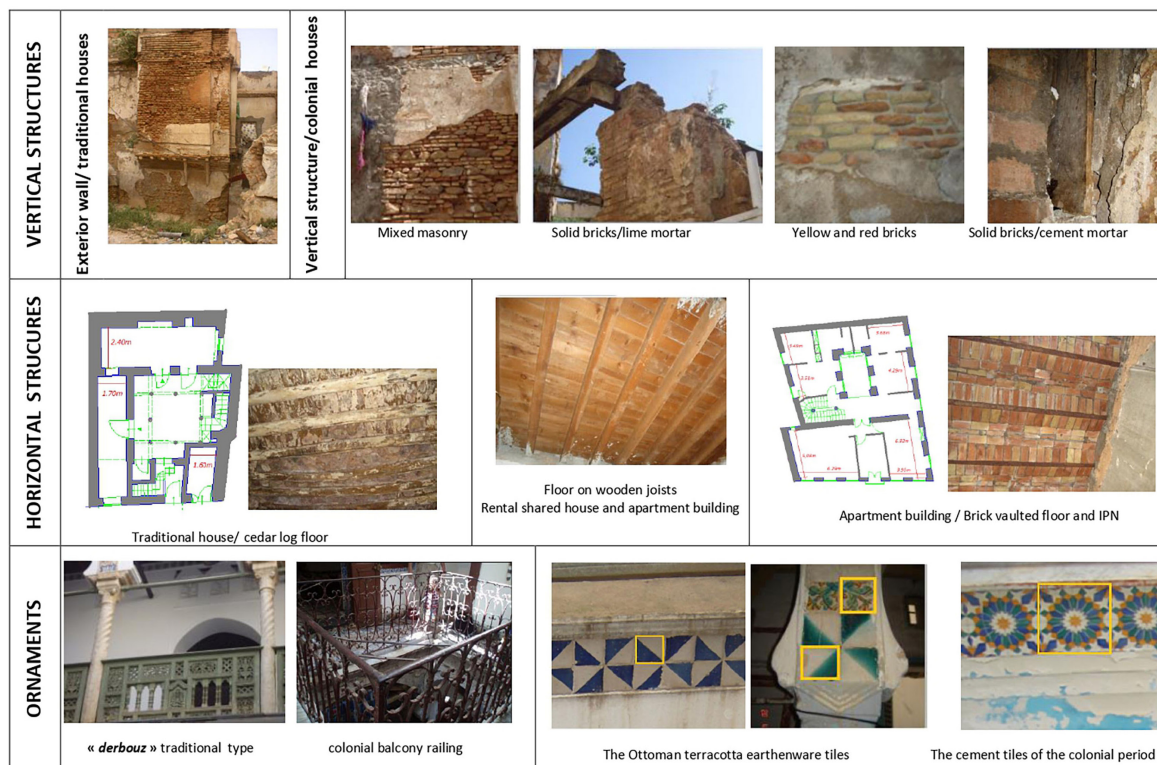


Figure 9. The constructive and the decorative aspects.

From the traditional ottoman house to the apartment building in the Kasbah of Algiers:
Adaptations and typological mutations

In the same way, the galleries surrounding this space are no longer a “spatial extension” of the habitable rooms but just a space for passage and circulation.

This new configuration of the central space as well as the galleries has resulted in the abandonment of the decoration of the interior facades, with the removal of the architectural elements that characterize the traditional facade: marble or tufa columns, terracotta tiles, wooden balustrades.

The walls are empty of any decoration; only openings that correspond to small doors or windows animate these walls and some cement tiles and iron railings occasionally decorate these interior facades and very often, earth brick pillars replace marble or tuff columns. It should be noted, that the purpose of the iron railing and the cement tiles are more functional than decorative. The railings are made from iron bars arranged vertically without any association of geometric shapes. The cement tiles are at a lower height than those of traditional houses and seem to have only the role of protection against water infiltration.

6. Conclusion

The dwellings examined in this study stand out for their adaptation or construction during the colonial era on Ottoman substrates within an urban fabric that has largely preserved its traditional structure. They bear witness to the emergence of residential constructions expressing remarkable hybridity, resulting from the domestication and constructive and architectural juxtaposition. A typological continuity gradually occurred, combining spatial and structural transformations, inducing the mutation of the traditional house into an apartment building.

This transformation unfolded in two stages, initially with the conversion of the traditional house into a shared rental house, foreshadowing the advent of a “local” model of cohabitation in the form of an apartment building organized around a central space. This organization stems from the constraints of the existing urban fabric, where organizing around a central space ap-

pears as an optimal solution for small contiguous parcels on multiple sides.

In this part of the old medina of Algiers, the interaction between two cultures has engendered a hybrid architecture marrying traditional Ottoman architecture and colonial architecture. This typology, far from a total break with pre-existing dwellings, represents a form of indigenous architecture resulting from the assimilation of traditional indigenous lifestyles with those of Western culture.

The gradual transition from the traditional house to the apartment building model proves to be an intrinsic response linked to the economic and social conditions of the time. The widespread impoverishment of the indigenous population, driven by factors such as property and land dispossession, fiscal discrimination until 1918, and the massive exodus of people from various geographic origins (Kabyle villages, highlands, Sahara) due to poverty, famine, and later, war, led to a significant migration of the “natives” to the medina, the only enclave capable of accommodating them. A new population with distinct characteristics emerged, prioritizing the search for work and a “place” to live.

This conjuncture forced the locals to accept different living conditions, marking a significant evolution in the architectural configuration of dwellings, now adapted to the social and economic imperatives of the time but certainly decidedly not aligning with the lifestyle of the indigenous population.

Indeed, In the Ottoman era, the Kasbah was horizontally divided into two realms: women occupied the entirety of the upper city, while the streets below belonged to men. However, with the advent of the central courtyard apartment building typology, the domain traditionally held by women vanished, accompanied by the disappearance of terraces and the conversion of the “*wast ed-dar*” into a ventilation and illumination courtyard.

Considerations arise regarding the repercussions of this spatial reorganization on space utilization. It appears that the spatial layout of the apartment building not only facilitated the re-

removal of men from the household but also isolated, suffocated, and confined women to “cells,” potentially pushing them towards embracing a European lifestyle by venturing outside more frequently. Bearing in mind that architecture and urban planning, in the colonial context, are considered part of the practices that make up colonial discourse, we can assume that through the transformation of the “family home”, the “colonist” is gradually erasing the culture and identity of the “colonized”.

Furthermore, this mutation from the traditional house to the apartment building, accompanied by significant changes in architectural, construction, and decorative aspects, has had a significant impact, not only on the use and appropriation of spaces, but also on numerous characteristics of traditional urbanism in Algiers, its constructive homogeneity and urban aesthetics, offering avenues for further study.

Needless to say, the lifespan and longevity of a building are determined by its intrinsic qualities. However, in this context, the transformations of the building size and scale, the juxtaposition and the association of both the traditional and the colonial construction system, seem to be responsible for the deterioration of the buildings, the loss of both physical and structural coherence and harmony in the urban composition.

What's more, this increase in building height not only undermines the coherence and stability of the block, it also destroys the regular amphitheatre morphology of the site and disrupts the city silhouette harmony, which was once called the “city of terraces”.

The façade of this new apartment building typology led to a shift of paradigm in relation to the urban space between the introverted traditional house and the extroverted apartment building. It also follows a dichotomy in the logic of composition open/closed with a regular arrangement for the colonial façade and an irregular one for the façade of the traditional house.

Endnotes:

[1]: Al-Jaza'ir, meaning “the islands,” referencing the islands facing the waterfront.

[2]: For the historical evolution of the city, see, among others, the following works:

- Devoulx, A. (1875-1876-1877 & 1878). *Alger. Etude archéologique et topographique sur cette ville, aux époques romaine (Icosium), arabe (Djezair Beni Maz'renna) et turque (El Djezair)*. *Revue Africaine*, Vol 19, 1875, 289-332, 385-428, 497-542 ; vol.20, 1876, 57-74, 145-163, 245-256, 336-351, 470-489 ; vol 21, 1877, 46-64, 225-240 et vol 22, 1878, 145-159.

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- Lespès, R. (1930). *Alger, Etude de géographie et d'histoire urbaine*. Paris : F. Alcan

- Missoum, S. (2003). *Alger à l'époque Ottomane. La médina et la maison traditionnelle*. Alger: INAS.

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Algeria.

- Çelik, Z. (1997). *Urban Forms and Colonial Confrontations: Algiers under French Rule*. Berkeley: University of California press.

[3]: refer to:

- Çelik, Z. (1997). *Urban Forms and Colonial Confrontations: Algiers under French Rule*. Berkeley: University of California press.

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- Picard, A. (1994). Architecture et Urbanisme en Algérie. D'une rive à l'autre (1830-1962). *Revue du monde musulman et de la méditerranée*. (73-74), 121-136.

[4]: The concept of the «safeguarded sector» originated with the promulgation of Law No. 98-04 on June 15, 1998, concerning the protection of cultural heritage. Article 43 of this law defines preserved sectors as “urban or rural real estate complexes such as Casbahs, medinas, Ksours, villages, and traditional agglomerations characterized by their predominantly residential zones. These areas, due to their homogeneity and architectural and aesthetic unity, exhibit historical, architectural, aesthetic, or traditional significance justifying their protection, restoration, rehabilitation, and enhancement.” The Kasbah of Algiers was designated a “safeguarded sector” in 2005 (Decree No. 05-173, Official Journal No. 34, dated May 11, 2005).

[5]: From 1830 onwards, houses dating from the Ottoman period were referred to in this way. They were individual, introverted, low-rise dwellings, generally containing a patio or skylight, usually in a central position, through which the various spaces received air and light. (See Missoum, 2003).

[6]: The Safeguard and Enhancement Plan for the safeguarded Sector is the management tool for a preserved sector in accordance with Executive Decree No. 03-324 outlining the establishment procedures for the PPSMVSS. It serves as an urban planning document that replaces the land-use plan (POS). The study of the PPSMVSS for the Kasbah of Algiers was entrusted to the consulting firm: National Center for Applied Studies and Research in Urban Planning (CNERU) in 2006 and was approved in 2012.

[7]: This corresponds to the house, which is organized around an open courtyard known as “*wast ed dar*.”

[8]: This corresponds to the house, which is organized around a courtyard known as “*wast ed dar*” closed by a

fencing system called “*chebbek*.” This is manifested on the terrace floor by an opening enclosed with crisscrossed or parallel metal bars.

[9]: This refers to a house organized around a staircase that distributes the various rooms, typically equipped with a skylight.

[10]: See the works of Sakina Missoum (1993 & 2003), where the author explains that “*Dwira*,” meaning “little house,” is a diminutive of “*dar*,” meaning “house”. As for the term “*alwi*,” also known as “*Aloui*” (elevation, height...), it is related to the designation of houses with two levels or a single floor in Istanbul as “*Oulwi*” (high, elevated). The author concludes that these are small-sized houses that develop vertically.

[11]: The Medina of Algiers is divided into two parts: the lower part, relatively flat and known as “*El Outa*,” housed the homes and palaces of the prominent dignitaries of the time, as well as various public buildings. The upper part, called “*El Djebel*,” was residential and occupied by the indigenous population.

[12]: Utilizing these documents for the aforementioned thesis as well as for the research presented in this article required supplementary information gathered during site visits.

[13]: House organized around a courtyard called “*wast ed dar*”, either open or closed by a fencing system called “*chbek / chebbek*” (ednotes: [7] and [8])

[14]: house organized around a staircase that distributes the various rooms, typically equipped with a skylight. (ednote: [9])

[15]: The increase in the indigenous population can be attributed to several factors: expropriation in areas occupied by Europeans, rural exodus due to the liberation war and famine, driving Algerians to seek employment in the capital and its old Medina.

See the works of:

- Berque, A. (1936). *L'Habitation de l'indigène algérien*. *Revue Africaine*. (78), 43-100.

- Lespès, R. (1935). *Projet d'enquête sur l'habitat des indigènes musulmans dans les centres urbains d'Algérie*. *Revue Africaine*. (362-363), 431-436.

[16]: This arrangement of doors helps to thwart potential external gazes.

[17]: Refer to the works of : Marcais, G.(1952); Golvin, L. (1957)., and Barrucand, M. (1992).

In their investigations into halls, anti-halls, and the "T" arrangement, Marcais, G and Golvin, L postulated the hypothesis of a filiation link between the Qbou (Algiers) and the iwan (of Persian origin). Barrucand, M highlighted the presence of this "T" arrangement at Madinat al Zahra (10th century) and the Alhambra in Granada.

[18]: We find this configuration in the *Fahs* houses, beyond the walls, from the Ottoman era. Surrounded by gardens, without any opposite view, the facades of *Fahs* houses, built according to the model of open *Wast ed dar* houses, feature openings overlooking gardens and orchards. They are generally arranged at the level of niches and the Qbou space of the tripartite room and are equipped with gratings.

[19]: The author talks about one room fitting behind another, forming a helix inside the perimeter of the house. This system for arranging rooms is known as the "kaim-naim" scheme.

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