The City as a Machine: A Sociological Study of Le Corbusier's Thought and Its Relationship to Social Interaction in the City of Ali Mendjeli

Amal MEKALFA
University of Kasdi Merbah, Ouargla, Algeria
Email: amal.mekalfa@univ-ouargla.dz

Received: 12/07/2025; Accepted: 24/02/2026; Published: 15/04/2026

Abstract

The idea of the city as a machine is among the most prominent concepts through which modernist urban thought was applied during the twentieth century, and it is fundamentally associated with the Swiss–French architect and planner Le Corbusier. This conception was not merely a technical approach to organizing society; rather, it constituted a comprehensive vision of the city as a rational and functional system, presumed to guarantee efficiency, health, order, and spatial justice. Despite its progressive character, however, this vision has generated profound debate regarding its relationship to human beings, particularly in terms of social interaction, human relationships, and the production of an interactive character within the society.

This article seeks to offer a sociological reading of Le Corbusier's thought on the concept of the city as a machine by analyzing its intellectual foundations and planning vision, and by examining how his functionalist approach contributed to the reconfiguration of urban spaces and social relations. It also aims to discuss the extent to which this conception is suited to the needs of contemporary societies, and to highlight the challenges it poses in achieving a balance between urban efficiency and the preservation of the human aspect of the city. The analysis is applied to the case of the city of Ali Mendjeli, considered as a contemporary model of rational–functionalist planning within the Algerian context.

The study shows that the city-as-a-machine model contributed to establishing the foundations of modernist planning based on efficiency and function; however, it also led, conversely, to:

- the dominance of the functional aspect in the planning of societies
- weak social interaction within residential spaces;
- a decline in the sense of belonging within the neighborhoods of the "mechanical" city;
- the emergence of a contradiction between urban design and social practices.

Keywords: City as a Machine; Le Corbusier; Functionalist Theory; Social Interaction; Modernist Architecture.

Introduction

The early twentieth century witnessed major transformations in urban thought, coinciding with the rise of the Industrial Revolution and advances in modern technology, which led to a redefinition of the relationship between human beings and the city. The industrial city emerged not merely as a spatial entity but as a new social organism reshaped by technological rationality, one in which, as Mumford (1961, p. 570) observed, "the increasingly automatic processes of

production and urban expansion have displaced the human goals they are supposed to serve." Within this context, the philosopher and architect Le Corbusier emerged as one of the most prominent pioneers of modernism, advancing a radical vision of the city as a machine, declaring that "a house is a machine for living in" (Le Corbusier, 2007, p. 151). This vision was grounded in his belief in the capacity of rational planning to achieve efficiency and optimal organization of society through the principles of functionalism and strict functional zoning.

However, this conception, which in its time appeared revolutionary and promised a more efficient and orderly city, raises profound questions when examined from a sociological perspective. As Biagi (2021, p. 603) argues, urban functionalism relies on "a mystical faith in technology" as a tool to leap beyond political ideologies, leading Le Corbusier to overlook, as Lefebvre observed, "the meeting places and social spaces […] where human beings socialize in the unpredictability of life" (Biagi, 2021, p. 604). The city is not merely a mechanical system that performs its functions efficiently; it is also a social and cultural space that carries collective memory and embodies a dense network of human interactions. From this standpoint, the study of the concept of the city as a machine in Le Corbusier's thought gains particular significance, as it enables an understanding of the relationship between mechanistic urban planning and the nature of social relations, as well as the challenges this model poses within the context of contemporary cities.

Section I: The Theoretical Framework of the Study

I. The Research Problem

Contemporary experience demonstrates that many modern cities, despite the levels of organization, infrastructure provision, and functional efficiency they offer, nonetheless suffer from profound social paradoxes. These paradoxes are manifested in the weakening of social ties, a declining sense of belonging to place, and the dominance of individualistic modes of living within highly regulated urban environments (Sennett, 1977) . In many cases, the city has become a space primarily oriented toward movement and consumption rather than a realm of social interaction. This condition raises fundamental questions about the nature of the planning models under which such transformations have been produced.

Within this context, functionalist planning emerges as one of the most influential approaches in shaping the modern city. It is based on the division of society into specialized zones that perform specific functions, thereby ensuring efficiency and spatial fluidity. However, this form of organization, which appears successful from a technical standpoint, reveals multiple social dysfunctions. Jacobs (1992, p. 14) argues that cities built on rigid functional planning produce areas that "lack this kind of intricate mutual support," resulting in the fragmentation of social relations, the contraction of shared and collective spaces, and the transformation of the individual from a social actor who participates in shaping its patterns into a mere user subjected to the system's functional and organizational logic.

Le Corbusier represents one of the most prominent theoretical and practical expressions of this orientation. He proposed a conception of the city as a “machine for living,” governed by a rational and functional logic inspired by the industrial model of organization and planning. This vision contributed to the reconfiguration of society in ways that rendered them more ordered and disciplined; however, it simultaneously re-produced social life within spatial

frameworks that were predetermined in advance (Biagi, 2021, p. 603). This, in turn, affected the nature of social interaction, patterns of habitation, and residents' representations of the city. In this context, the city of Ali Mendjeli in the province of Constantine serves as a highly significant empirical model for studying the manifestations of this modern urbanistic thought within the Algerian reality. Its reliance on functional planning, characterized by repetitive neighborhoods, identical residential blocks, and a vast network of roads, reflects the core features of the mechanical vision of the city.

However, field observation of the city of Ali Mendjeli reveals a sociological paradox that highlights the disparity between urban organization and the social practices of community members. From this perspective, the central problem addressed in this paper emerges in the tension between the functional efficiency achieved by the Corbusian approach and the social repercussions resulting from reducing the city to its mechanical dimension. Accordingly, this study seeks to address the following question:

- To what extent is Le Corbusier's model capable of reconciling functional rationality with the requirements of the city as a space for social interaction and the construction of human relationships, without reducing it to a purely mechanical logic?

II. Research Hypotheses

1. The functional separation of spaces (housing, work, and recreation), as proposed by Le Corbusier, leads to a reduction in opportunities for social interaction and to the weakening of social relationships within the city of Ali Mendjeli.
2. Residents tend to modify mechanically designed spaces in order to infuse them with human and cultural characteristics.

III. Le Corbusier's mechanistic vision is compatible with the requirements of urban organization; however, it conflicts with individuals' needs for interaction within society.

Significance of the Study

The study of the city as a machine from the perspective of Le Corbusier's thought and its relationship to social interaction within society, as exemplified by the new city of Ali Mendjeli, contributes theoretically to enriching the sociological debate on the concept of the city as a machine. It helps to clarify key concepts and meanings related to the city and to Le Corbusier's functionalist theory, particularly in relation to the shaping of patterns of social interaction within urban space. Moreover, it establishes a link between architectural–engineering thought and sociological analysis, thereby strengthening the environmental approach to the study of the city and addressing a knowledge gap concerning the relationship between the mechanistic organization of space and the social aspect.

As for its empirical significance, the study provides a deeper understanding of how residents of the city of Ali Mendjeli interact with spaces designed according to a rational–functionalist logic, and it highlights the reasons underlying the modifications and transformations that residents introduce into these spaces.

IV. Objectives of the Study

- To identify the theoretical foundations of the concept of the "city as a machine" in Le Corbusier's thought, in order to understand its intellectual and urban premises and how it established a mechanistic vision of the city.

- To analyze the impact of the functional separation of spaces on social relationships within the city, and to explore the extent to which urban rationalization affects interpersonal ties.
- To assess the extent to which the mechanistic vision contributes to improving residents' material quality of life.
- To determine whether city inhabitants reproduce an alternative, more interactive spatial order or instead conform to the mechanical space of the city of Ali Mendjeli.
- To understand residents' representations of patterns of social interaction within a city planned according to a rational–functionalist logic.

V. Limitations of the Study

1- Spatial Scope:

The spatial scope of this study on the concept of the city as a machine in Le Corbusier's thought and its relationship to social interaction within society is limited to selected modern urbanistic spaces, represented by vertical residential communities in the city of Ali Mendjeli, located in the province of Constantine. This case was selected on the basis of several sociological and urbanistic considerations, including the following

- The city of Ali Mendjeli is a pre-planned urban development established according to a strict functional zoning of uses (housing, education, services, commerce, etc.), which is consistent with Le Corbusier's conception of the city as a machine for living, working, and movement.
- Ali Mendjeli aligns with Le Corbusier's ideas through the separation of vehicular and pedestrian circulation, reliance on wide road axes, high-density vertical housing, and the standardization of residential spaces, making it a local applied model of modernist urbanism characterized by a rigid functionalist orientation.
- From another perspective, the new city of Ali Mendjeli reflects housing and urban development policies in Algeria and reveals the limitations of replicating Western modernist models within an Arab–Islamic cultural context.

2- Geographical and Planning Limitations:

The city of Ali Mendjeli is located on the Ain El Bey plateau, approximately 15 km south of Constantine, 12 km west of the city of El Khroub, and 10 km east of Ain Smara, at an average elevation of about 800 meters above sea level. Its total area is estimated at approximately 1,500 hectares.

The idea of developing the new city of Ali Mendjeli was introduced within the framework of the guidelines of the Urban Development Plan (Plan d'Urbanisme Directeur – PUD) of 1982, followed by the Master Plan for Development and Urban Planning (Plan Directeur d'Aménagement et d'Urbanisme – PDAU), which was approved by Executive Decree No. 98/38 dated February 25, 1998. The city was subsequently established in accordance with Executive Decree No. 2000/17 dated August 5, 2000.

3- Methodology

This study adopts a descriptive-analytical method within a qualitative approach to examine the concept of the "city as a machine" in Le Corbusier's thought and its relationship to social interaction within the society of Ali Mendjeli. The city is approached as a model of this mechanistic vision, with the aim of understanding the relationship between rational urbanistic

planning and patterns of social interaction. The analysis is conducted by examining social implications in light of this concept. This involves describing the neighborhood's urbanistic layout, including building typologies, the distribution of road networks, and open spaces, and linking these elements to spatial usage by analyzing residents' movements, the concentration of individuals within specific areas, and the extent of their social interaction.

Furthermore, the study analyzes the modifications and practices carried out by residents within these spaces. This allows for the identification of forms of re-producing more interactive social spaces that directly challenge the rigid functionalist character of the city of Ali Mendjeli."

Section II: Functionalist Theory in Le Corbusier's Thought

I. Definition of Functionalism

Functionalism is the principal and most influential theory in modern architecture, having exerted the greatest impact on its emergence and development, to the extent that contemporary architecture is often described interchangeably as either modern architecture or functional architecture. A range of concepts and ideas coalesced around this theory, through which it became widely known, most notably the principles that "form follows function" and that "the house is a machine for living." (Irfan, 1996, p. 1)

"The functionalist school is one of the most prominent currents of modern architecture. Functionalism in architecture is based on the principle that the form of a building should be determined by practical considerations such as use, materials, and structure. Design must reflect the purpose and function of the building. The core idea of functionalism can be expressed in the slogan 'form follows function.'" (Encyclopaedia Britannica, n.d.)

"According to Sami Irfan, architecture constitutes a field of human activity concerned with building and construction, in which the achievements of other sciences and arts are applied. Buildings, in this sense, are fundamentally erected to serve a practical purpose and to provide a utilitarian benefit" (Irfan, 1996, p. 39)

Architecture, therefore, is not a pure art that exists merely for aesthetic satisfaction or experimental pleasure, as is the case with poetry, music, sculpture, or painting. Rather, it is an applied art that fulfills two purposes simultaneously: beauty and utility. It embodies both material and symbolic values, as well as monumentality, durability over time, and the noble services it provides. Moreover, other forms of beauty associated with architecture are linked to emotional and cultural considerations. Thus, the practical benefit of a building—that is, its function—remains a fundamental and indispensable element. (Irfan, 1996, p. 21)

II. The History of Functionalism (Origins and Development)

Functionalism emerged as a factual reality as early as prehistoric times, when human beings first felt the need for means that would assist them in survival. At that stage, humans began to manufacture tools and weapons that functioned as extensions and complements to their bodily organs, compensating for their natural weakness in confronting enemies and a hostile environment that had to be subdued in order to live in safety and comfort. Primitive humans, through instinctive perception and practical experience, realized that such tools and weapons had to be well made and fit for use; consequently, they devoted care and effort to producing effective tools and powerful weapons. These objects were originally created for a fundamental reason—purpose and utility.

With the passage of time, the concept of functionalism evolved. In machines, for instance, one observes successive stages through which forms increasingly adapt to their functions, while superfluous elements are eliminated so that the object may perform its function in the most efficient manner. In this way, functional adaptation existed before humans developed a conscious theoretical understanding of it. Function thus served as a guarantee that an object was fit for its purpose, a means of empowerment against nature, and an essential condition for survival. (Smithies, 1998, p. 79)

"By the nineteenth century, many architects were primarily focused on style, giving precedence to the design of form and the external appearance of buildings. With the emergence of the massive scale of destruction following the world wars, however, an urgent need for reconstruction arose, accompanied by the development of new construction techniques and building types. At the same time, cultural and aesthetic values underwent significant transformation. As a result, a search began for a modern architectural thought capable of responding to a reality marked by economic crises. Within this context, functionalism emerged in architecture, envisaged as a more engineering-oriented and less purely artistic approach. Attention was thus shifted away from formal considerations, while priority was given to efficient housing that utilized the minimum possible amount of resources—whether material, financial, or human—while achieving optimal results." (Portela, 2022)

The most significant driving force behind the emergence of functionalist theory can be traced to a catastrophic event with far-reaching consequences: the Great Chicago Fire of 1871. This disaster resulted in the destruction of much of the city and created an urgent need for reconstruction. In this context, the city was compelled to accept poorly designed and aesthetically deficient buildings that lacked rigorous study and innovative, radical solutions. This situation, in turn, opened the way for the emergence of new architectural patterns and approaches.

Lewis Sullivan is regarded as a leading advocate of architecture in the modern technological age. He was among the first to formulate intellectual solutions to address the artistic and technical demands posed by construction problems, particularly those related to metal structural systems and skyscrapers. Sullivan laid the foundations of functionalist theory through his famous dictum, "form follows function." (Irfan, 1996, pp. 46-47)

Le Corbusier, for his part, described the house in his book Towards a New Architecture as "a machine for living in." Consequently, twentieth-century contemporary architecture, under the influence of functionalist theory, moved toward abstraction and the elimination of all elements deemed unnecessary or lacking a clear function. Ornamentation came to be regarded as an architectural crime, while decorative motifs and traditional embellishments were considered superfluous and devoid of practical value. Modern architecture thus adopted a set of defining characteristics, the most important of which include:

- Greater interaction with the surrounding environment and its influence on architectural design at the material level, through a shift toward green environmental architecture, complemented by smart architecture.
- A globalized formalist mode of thought resulting from political, economic, commercial, and digital globalization, giving rise to new orientations toward architecture and virtual reality.

- The borrowing of architectural form from the characteristics of environmental form in affective composition.
- That objects must appear as they truly are, or that their essence should correspond to their outward form, and that form should clearly indicate function. (Hanafy , 2008, pp. 176-176)

Accordingly, functionalist theory is based on a number of fundamental principles in architectural design, including the following:

- Form must follow function.
- Forms should be simple and derived from primary geometric shapes, and the forms employed should reflect technological advances in construction.
- The reduction or elimination of ornamentation and additive elements that characterized classical architecture.
- Spatial continuity, whereby space should be continuous and perform a function in the same way as the internal space of the city (the dwelling).
- The avoidance of any historical symbolism, traditional motifs, or references to previous architectural styles in urban design.

III. Principles of Functionalist Theory

1. Buildings Are Designed Like Machines

"Since the advent of the age of reason or thought in the eighteenth century, and with the demonstration of the superiority of science over emotion, perspectives toward the world became primarily scientific. Machines came to represent the tools of the age in work and production."

Proponents of this view argue that buildings should be designed in the same manner as machines, through science, logic, precision, and calculation, such that every element exists for a reason, in a required quantity, and performs a specific function.

Thus, Gropius called for an architecture suited to the age of machines, radios, and fast automobiles, while Le Corbusier described the house as a "machine for living in" (The Home as a Machine to Live In).

However, this emotional view is unjustified and is not grounded in any reasonable intellectual basis consistent with the age of logic and science in which it emerged. Despite this, architects were strongly influenced by it and continued to work according to its logic, even when it appeared under different names.

2. The Imitation of Machine Forms in Buildings

Due to the immense capabilities of machines, their contemporaries and engineers were fascinated by them, and they came to be held in high esteem by all.

People became fascinated with machines, grew attached to them, and turned them into objects of contemplation, mistakenly identifying them as the most important thing in life and as everything in life.

Artists were not removed from this influence; they drew inspiration from machines in their various artistic practices. Among them were painters such as Ozenfant, Le Corbusier, and Léger, who depicted human figures in his paintings as resembling metallic manufactured objects—a tendency that was also evident in sculpture.

It was architecture's turn, despite its greater complexity and constraints compared to other arts. Why should architecture not employ machine forms, given that plant forms had already been adopted in Art Nouveau.

Some architects employed specific components of machines, while others designed buildings in the form of entire machines. Le Corbusier, for example, adopted elements derived from ships, such as staircases, round windows, and small balconies. Frank Lloyd Wright also designed a house with roofs extending from both sides known as the "Airplane," as well as another referred to as the "Battleship.

This perspective, however, was short-lived and soon changed when architects realized that machine forms themselves were subject to continual transformation.

3. The Use of Machines and Their Products in Architecture

This represents a rational and sound approach, whereby architects benefit from the possibilities of the modern era while taking into account the resulting changes in construction methods, building techniques, and materials, as well as the impact of these factors on the final architectural form.

In this way, architecture can belong to the modern age, and its architectural expression can be genuine rather than artificial.

This perspective persisted into the modern era, as machines came to achieve what humans could not, and at an exceptional speed. It therefore became more practical to take advantage of this capacity in the manufacture of building components and elements. Why, then, should machines not be used in the production of doors and windows, thereby saving time and reducing costs that were previously consumed by traditional construction methods?

All of this is acceptable, provided that the machine does not overshadow human thought—and architectural thought in particular—and that artistic values and sensibilities do not become purely industrial sensibilities that accept only what the machine produces and admire nothing except mechanical precision (the beauty of what the machine produces versus the beauty of what the human hand creates). (Architecture, n,d)

IV. Le Corbusier's Thought

1- His Life

Le Corbusier's real name was Charles-Édouard Jeanneret-Gris. He was born in 1887 in a Swiss village and is regarded as one of the greatest and most influential architects in France and worldwide. His name is so closely associated with modern architecture in the twentieth century that it is difficult to mention one without evoking the other. (Irfan, n.d, p. 374)

Le Corbusier differed markedly in his professional life from the architects of his time due to the diversity of fields and activities in which he was involved. In addition to architectural practice, he was deeply engaged in urban planning, participated in numerous competitions, and carried out many major architectural projects outside France, notably in the Soviet Union, Germany, Switzerland, the United States, Brazil, Argentina, Algeria, and India. (Zitoune, 1993, p. 115)

He undertook extensive study of the historic buildings he encountered, through which he developed ideas about what the architecture of the future should be. He became firmly convinced that architectural form must arise from the vast possibilities afforded by the Industrial Revolution. Accordingly, he abandoned thick walls—regarded as principal features

of classical architecture—as well as ornamentation, arguing that facades should be stripped of decoration so that architecture might assume a form consistent with the role of the machine.
In 1923, Le Corbusier published his famous book Towards an Architecture, in which he articulated the essence of his ideas concerning the architecture of the future. He envisioned this architecture as universal and valid for all times and places, as it was founded on rational and scientific principles aimed primarily at fulfilling function—the fundamental purpose of erecting buildings in general—just as the automobile, the ship, and any other machine efficiently fulfill their respective functions. This perspective served to reaffirm his well-known dictum: "The house is a machine to live in." (Zitoune, 1993, p. 55)
He formulated a set of fundamental principles that came to define the features of modern architecture, which he referred to as the "Five Points of a New Architecture."

- Raising buildings on pilotis: in order to ensure the continuity of public spaces, allowing gardens to extend and exterior space to remain uninterrupted by construction, while allocating the ground floor to parking, the main entrance, and certain other service functions.
- Roof garden: the roof garden is considered a logical extension of the building, as it offers several benefits. It provides insulation against cold in winter and protection from solar heat in summer (a practical and inexpensive method of thermal insulation), and it offers comfort and enjoyment to residents, much like a conventional garden at ground level.
- Free Facade: through the use of a structural system, windows can extend around the entire building, or external walls may be replaced by a glass envelope or continuous glazed surfaces.
- Free plan: whereby the wall's function is reduced to merely separating spaces, thereby allowing greater freedom in design.
- Horizontal ribbon windows: to provide continuity between interior and exterior spaces through the use of large windows instead of small ones. (Irfan, 1996, pp. 366,389)

2- Features of Le Corbusier's Architectural Thought in the Articulation of the Box-Like Building

Le Corbusier held a distinctive view of the classical box form. Although he did not explicitly or radically attack box-like buildings, his approach can be summarized as preserving the overall box form while introducing voids and cut-outs within it. These interventions allowed for the integration of interior spaces with the exterior, all while remaining within a pure geometric framework that continued to define the formal characteristics of the box. This approach contributed to the creation of a new configuration of interior architectural space. Le Corbusier's efforts in this regard were extensive and encompassed all aspects of spatial organization.

- **Architectural space:** within this framework, Le Corbusier did not seek to extend interior space outward through the concept of spatial fluidity previously achieved by Wright. Instead, he relied on allowing exterior space to penetrate and merge with interior space through the recesses and voids he introduced into the box-like form. In addition to this, he demonstrated the ability to position interior walls freely, regardless of variations between the building's different floors.

- **External boundaries (walls):** Le Corbusier deliberately articulated the box at the corners, thereby enhancing the connection between interior and exterior spaces. He also freed the external walls from the structural system, enabling them to be positioned freely.
- **Openings:** by adopting the principle of long horizontal openings, Le Corbusier was able to achieve a connection between interior and exterior space through these continuous bands.
- **Ceiling:** Le Corbusier sought to treat the ceilings of interior spaces through the openings he introduced into them. His works are notably characterized by double-height spaces, often incorporating mezzanines, through which space flows vertically between two levels. (Chihab Ahmed, 1993, p. 48)

3- The Influence of Algerian Architecture on Le Corbusier's Thought

Le Corbusier became aware of the distinctive character of Algerian architecture during his visit to the country in 1931, following an invitation from the Friends of Algeria Association, during which he developed a new urban plan for the capital. Although his proposals were not implemented due to the reluctance of the colonial authorities, this visit brought about a radical transformation in his perception of Eastern architecture.

Le Corbusier was struck by the unique spatial qualities of the Kasbah, the historic core of Algiers, and was deeply impressed by its construction techniques, the optimal use of light, and the careful framing of views toward the sea—techniques that had been consciously preserved by its original builders. Acting on the advice of one of his engineer colleagues, he also visited the city of Ghardaïa in southern Algeria. Architectural historians regard this visit as Le Corbusier's "second journey to the East," his first having taken place in 1911 with his visit to Istanbul.

In Ghardaïa, a city built in the M'zab Valley, a region characterized by a harsh desert climate, confronting extreme heat and scorching conditions posed a major challenge for its founders. Relying on clay as a primary building material, they devised a unique method of natural air conditioning that ensured thermal comfort without compromising access to light. They also deliberately narrowed the streets, transforming them into corridor-like passages that provided protection from intense solar radiation. These techniques—shaped with remarkable aesthetic sensitivity—led Le Corbusier to describe Ghardaïa as a "sparkling city." This visit subsequently inspired the design of the Notre-Dame-du-Haut chapel in Ronchamp, eastern France, whose architectural expression echoes the splendor of M'zabi urbanism. (Karef, 2015)

Le Corbusier's engagement with the Mzab Valley is articulated in his book Towards a New Architecture, in which he examined Mzabite architecture for its austere clarity and its formal configurations adapted both to environmental conditions and to family-based social organization. This architecture became a major source of inspiration for Le Corbusier, widely regarded as one of the seminal architects of the twentieth century. He further drew inspiration from the Mausoleum of Sidi Ibrahim Tajenint in El Atteuf for the design of the Church of Ronchamp (Notre-Dame du Haut), the celebrated chapel located in the Vosges region of France. Le Corbusier also noted that Ghardaïa—constructed in the Mzab Valley, a desert region marked by a harsh climate—confronted its founders with the challenge of extreme heat and scorching sunlight. In response, they devised, through the use of earth-based materials, a

distinctive method of creating natural air conditioning without sacrificing daylight. They also narrowed the streets, transforming them into shaded passageways that functioned as arcades, thereby avoiding direct exposure to the burning rays of the sun. These techniques, articulated with striking aesthetic refinement, led Le Corbusier to describe Ghardaïa as a "shimmering city." His visit to the Mzab Valley resulted in the design of the Church of Notre-Dame du Haut in Ronchamp, eastern France, a work that echoes the grandeur and architectural splendor of Mzabite urbanism. (ATMZab, n.d)

Section III: The Empirical Dimension

I. Analysis of the Results in Light of the Hypotheses

First Hypothesis: The functional separation of spaces (housing, work, and recreation), as proposed by Le Corbusier, leads to a reduction in opportunities for social interaction and to the weakening of social relationships within the city of Ali Mendjeli.

To test the validity of this hypothesis, the respondents answered the following questions:

- What types of activities are most commonly practiced in the residential outdoor space?

Most respondents indicated activities such as sitting, conversing with neighbors, and watching children as they play.

- Is the place of work or study, in relation to the place of residence: located within Ali Mendjeli or outside Ali Mendjeli?

Seven out of ten respondents stated that they carry out their professional and educational activities outside Ali Mendjeli.

- Do you feel that the separation between residential and recreational spaces affects your social relationships?

Through this question, the respondents reflected carefully in their answers. Some acknowledged the importance of neighborhood relations and noted that being obliged to travel to locations far from their place of residence—particularly for children's recreation and play—has a significant impact on their sense of comfort and reassurance. This is due to children playing with unfamiliar individuals, as well as the fact that play spaces are open and exposed, which requires constant supervision and generates a persistent fear of theft.

Analysis of Results: The fieldwork findings revealed that the adoption of strict functional segregation between residential spaces and areas of work and recreation in the city of Ali Mendjeli has led to the fragmentation of residents' everyday life. The residential space no longer accommodates multiple social functions, as was the case in traditional neighborhoods. This separation has transformed the residential district into a space primarily for transit and dwelling only, rather than a setting for integration or continuous social interaction—effectively rendering the city a mere "dormitory city."

The results further indicate that social interaction has become limited and temporary, confined mainly to greetings and brief encounters. Spontaneous meetings—typically generated by the overlap of functions such as housing, commerce, worship, and recreation—have largely disappeared. This has led to the weakening of neighborhood relations in comparison with traditional spatial settings, thereby confirming that functional segregation reduces opportunities for the daily contact necessary for building social bonds. Social relations within Ali Mendjeli are characterized by fragility due to a diminished sense of neighborhood

belonging, with utilitarian relationships prevailing over solidaristic ones. This shift reflects the transformation of space from a social space into a functional environment governed by the logic of movement and organization rather than that of shared living. Consequently, residents perceive their neighborhood primarily as a place for sleeping and rest, and recognize the space as lacking social vitality. This perception underscores the failure of the mechanical planning model to achieve the human aspect required in the organization of society.

Accordingly, the results confirm the validity of the hypothesis, as the functional segregation of spaces in Le Corbusier's model—as manifested in the city of Ali Mendjeli—has contributed to reducing opportunities for social interaction and weakening social relations. The findings also demonstrate that functional rationality, despite its organizational efficiency, is in tension with the requirements of social life.

Second Hypothesis: Residents tend to modify mechanically designed spaces in order to infuse them with human and cultural characteristics.

The following questions were raised:

- How do residents adapt to the outdoor space?

Most respondents answered that the city's public space lacks the conditions necessary for social interaction, which has compelled them to reappropriate and redefine the space. This is done by bringing chairs from their homes to sit, relying on makeshift or installed shades, or gathering in the shops of acquaintances.

- What are the reasons that drive you to modify the space?

The responses revolved around the nature of the alterations they had undertaken, indicating that the original design does not take family privacy into account—particularly due to the facing of balconies. In addition, the neighborhood lacks spaces dedicated to recreation.

Based on the respondents' answers and participant observation, it becomes evident that the city of Ali Mendjeli is structured around a purely mechanical space—that is, a space produced through modern urban planning dominated by a functional logic. It was designed primarily to organize residential blocks rather than to serve as a setting for social interaction. However, residents' everyday practices have generated multiple forms of adaptation and re-production of this space in ways that align with their social and cultural needs. At the level of daily use, residents tend to transform sidewalks, interstitial spaces between housing blocks, and building entrances into semi-private spaces where social activities such as sitting, conversation, children's play, small-scale commerce, and other practices take place. This reflects the residents' attempt to soften the rigidity of the planned space in Ali Mendjeli.

Adaptation also manifests through the localization of the outdoor space by introducing elements such as chairs, plant containers, or the use of shade, which function as symbolic expressions of attachment to place and as efforts to create a sense of familiarity within a vast and abstract urban environment. In terms of social relations, the outdoor space of Ali Mendjeli has become a medium for the reconstruction of social ties, as these spaces facilitate daily encounters and the exchange of greetings among neighbors, thereby transforming space from a mere corridor of passage into a setting for interaction.

Accordingly, it can be argued that the residents of Ali Mendjeli do not merely consume the outdoor space as it was originally planned, but rather socially and culturally re-produce it,

transforming it from a neutral functional space into a living social space. This process reflects their capacity for adaptation and their symbolic resistance to rigid mechanical planning.

Third Hypothesis: Le Corbusier's mechanistic vision is compatible with the requirements of urban organization; however, it conflicts with individuals' needs for interaction within society.

- How do you evaluate the organization of the neighborhood in terms of street legibility and the distribution of buildings?

In general, the neighborhood is well organized and the streets are clearly laid out, making orientation easy. The buildings are orderly and uniform, and each neighborhood is clearly identifiable. At the same time, however, all neighborhoods appear largely similar to one another.

- Is it easy for you to move within the neighborhood and access basic services?

Mobility is easy, especially by car, due to the wide roads. However, some basic services are located at a relatively considerable distance.

- Does the neighborhood provide sufficient spaces for meeting and social interaction among residents?

There are no designated spaces for sitting or socializing, despite the presence of vacant and undeveloped areas, particularly between residential blocks.

- Have informal spaces emerged in the neighborhood that were not originally planned?

Yes. Residents have created spaces in their own way, such as sitting in front of building entrances or in the spaces between housing blocks.

The results of the study indicate that the mechanistic vision adopted by Le Corbusier was relatively successful in fulfilling a number of urbanistic organizational requirements. It contributed to the clear division of functions (housing, work, recreation, and mobility) and facilitated traffic flow and spatial fluidity within the city. This reflects the effectiveness of the rational-functionalist perspective, which views the city as an organized machine governed by technical and engineering principles. Conversely, the findings reveal negative effects on social interaction; this approach reduced opportunities for spontaneous everyday encounters among individuals, hindered the formation of social networks within neighborhoods, and transformed public spaces into mere transit zones rather than spaces for interaction and shared living. This confirms that mechanistic organization disregards the symbolic and social nature of society.

The results also indicate that individuals do not experience mechanical space as a living environment, but rather perceive it as a functional domain for temporary use. They express a weakened sense of place attachment and experience a form of social alienation, which reflects a clear gap between the city as theoretically designed and the city as actually lived. Despite its mechanical character, residents seek to overcome this tension by reappropriating public spaces in unplanned ways, creating social gathering points within spaces not originally designed for this purpose, and introducing symbolic and material modifications that reflect their social needs.

Accordingly, Le Corbusier's mechanistic vision achieved relative success at the level of urban organization; however, it failed to accommodate the social and interactive needs of individuals. This contradiction reveals the limits of functional rationality when applied in isolation from

the human aspect, thereby calling for the adoption of urbanistic approaches that integrate technical organization with social interaction in order to ensure the vitality of society.

Analysis of the Results in Light of Le Corbusier's Functionalist Theory

- **Analyzing the Impact of Functional Segregation of Spaces on Social Interaction in the City of Ali Mendjeli in Light of Le Corbusier's Conception of the City as a Machine:**

Le Corbusier's conception of the city as a machine is based on the principle of strict functional segregation, whereby each activity is assigned a distinct and independent domain: residential space, work space, and recreational space. This division aims to achieve efficiency and the rational organization of society. However, its practical application generates profound social effects, as evidenced in the city of Ali Mendjeli.

In the city of Ali Mendjeli, the separation of residential space from spaces of work and recreation has led to a reduction in daily encounters among individuals. Movement within the city has been transformed into a functionally oriented commute—from home to work and back, rather than an open social mobility that allows for social interaction beyond the sphere of the family or immediate neighborhood. This functional separation has also contributed to emptying the outdoor space of social vitality, as open areas are used primarily for passage or transit rather than for sitting and socializing, due to the absence of diverse activities that typically generate social life in mixed-use spaces (such as shops, cafes, workshops, and services).

On the other hand, functional segregation has led to the fragmentation of residents' social time, as presence within the residential neighborhood is largely confined to limited periods, often in the evening. This reduces the continuity of interaction and weakens the sense of collective belonging to place. As a result, social relations within the city of Ali Mendjeli tend to be superficial or situational rather than enduring and deeply rooted.

Accordingly, it can be argued that functional segregation as conceived by Le Corbusier, despite its technical efficiency, limits opportunities for social interaction in Ali Mendjeli. This confirms that social life flourishes only within mixed-use spaces that allow for everyday and spontaneous encounters.

Analysis of the Adaptation of Ali Mendjeli's Residents to Outdoor Space in Light of Le Corbusier's Functionalist Theory (the City as a Machine)

The urban space of Ali Mendjeli constitutes a concrete embodiment of Le Corbusier's conception, which organizes the city according to the logic of efficiency, functional division, and the regulation of movement. Within this framework, outdoor space is viewed as a technical element that serves the functioning of the city rather than as a social space for human interaction. This conception is clearly reflected in Ali Mendjeli through the expansiveness of its spaces, the regularity of its residential blocks, and the dominance of function over symbolic and social dimensions. However, residents' everyday practices reveal the limits of this mechanistic model. Rather than adhering to the planned uses of outdoor space, inhabitants reinterpret and socially appropriate it. By occupying sidewalks, the interstitial spaces between housing blocks, and the areas surrounding building entrances, residents transform outdoor space from a domain of movement and transit into one of sitting, meeting, and play. This practice reflects a form of symbolic resistance to the city as a silent machine and an effort to transform or adapt it into a space of interaction.

Accordingly, the experience of Ali Mendjeli demonstrates that the model of the city as a machine remains inadequate for capturing social complexity, and that residents play an active role in transforming mechanical space into a living social space. In Ali Mendjeli, social life is not realized through design alone, but through social practices that re-produce space in accordance with local values and social relations. This confirms the centrality of human agency in the production of outdoor space, rather than the primacy of the machine or the planner alone.

- **Le Corbusier's mechanistic vision is compatible with the requirements of urban organization; however, it conflicts with individuals' needs for interaction within urban space.**

It thus becomes evident that:

1- Compatibility with the Requirements of Urban Organization: Le Corbusier's mechanical vision is based on rational organization and the functional segregation of spaces (housing, work, and recreation), along with the geometric design of streets and buildings. This approach achieves efficiency in urban management by facilitating mobility, the distribution of services, and overall urban order and cleanliness. Moreover, expansive open spaces contribute to ventilation and natural lighting and facilitate maintenance operations, rendering the city technically and administratively efficient.

2- Conflict with the Needs of Social Interaction: Despite its technical organization, this vision reduces opportunities for spontaneous encounters and everyday interaction among individuals.

- Residential and open spaces are often empty or configured primarily for circulation.
- The spatial separation between housing, work, and recreation reduces social interaction beyond the sphere of the family or immediate neighbors.
- This results in an urban space characterized by low social vitality, where social relations are confined to a limited scope and the city's everyday dynamism is absent.

3- Residents' Adaptation for the Reproduction of Social Space
Residents of cities where this vision has been implemented, such as Ali Mendjeli, resort to reappropriating mechanical space in informal ways through:

- the use of sidewalks and open spaces for sitting, play, and everyday social encounters.
- the creation of social gathering points that compensate for the void produced by rigid planning.

This demonstrates that it is the human being who endows the city with social vitality, not mechanistic design alone. Accordingly, the hypothesis that Le Corbusier's mechanistic vision corresponds to the requirements of urbanistic organization but conflicts with individuals' needs for interaction within lived space points to a contradictory balance: the mechanistic city excels in terms of organization and order, yet remains insufficient in meeting human needs for social encounters and daily interaction. Consequently, residents' intervention in repurposing spaces through informal practices becomes necessary to revitalize social life, underscoring that human agency is the fundamental element in imparting vitality to society.

Study Results

Through the analysis of the study data and in an effort to test the hypotheses upon which this article is based, the results revealed that:

- The urban model inspired by Le Corbusier's thought, based on a functionalist vision of the city as a machine, has been relatively successful in fulfilling organizational requirements and regulating urban expansion in the city of Ali Mendjeli.
- The limitations of the urban model rooted in Le Corbusier's thought in responding to residents' social needs, as the results confirmed that the mechanical character of Ali Mendjeli's spaces leads to weakened social interaction and a decline in social ties within residential neighborhoods.
- The absence of semi-public spaces and the weakness of meeting and gathering areas have contributed to transforming the city into a domain of transit and consumption rather than a space for communication and the building of social relations.
- The weakness of social interaction and the absence of a local neighborhood identity have contributed to a decline in the sense of place attachment among the residents of Ali Mendjeli, as the neighborhood is perceived as a space for temporary residence rather than a setting for shared social life.
- Social actors in the city of Ali Mendjeli seek to adapt mechanical spaces and endow them with a human dimension, whether through the informal use of shared spaces or by creating new patterns of social interaction within neighborhoods.
- There is a clear tension between functional rationality and the human dimension in the planning of the city of Ali Mendjeli, which calls for a reorientation of urban policies toward the adoption of a more comprehensive approach that recognizes the human being as the core of urban space and integrates social and cultural aspects into the planning process, thereby ensuring the realization of a city that is both functionally efficient and socially vibrant.

Conclusion

In light of the foregoing, it becomes evident that Le Corbusier's conception of the city as a machine for living contributed to establishing a rational urban model grounded in functional organization and technical efficiency, a model that is clearly manifested in the planning of the city of Ali Mendjeli. However, despite its success in responding to the requirements of urban expansion and regulating residential space, this conception has, in parallel, generated profound social challenges, notably the weakening of social interaction, the decline of community ties, and the dominance of utilitarian uses of social spaces at the expense of their human and cultural aspects.

This study has shown that the strict separation of functions and the reduction of the human being to a mere user of space have diminished opportunities for everyday encounters and symbolic interaction among residents, rendering the city closer to a space of movement and consumption than to a domain for the production of social relations. At the same time, the empirical reality of the city of Ali Mendjeli reveals the emergence of alternative social dynamics, as residents, through their daily practices, seek to re-produce space and endow it

with a social and human character, whether by appropriating shared spaces or by creating informal forms of communication. Consequently, the success of the urban model cannot be measured solely by the degree of functional rationality it achieves, but rather by its capacity to embrace the human being as a social and cultural actor. This calls for a rethinking of contemporary urban planning through the integration of technical and social dimensions, allowing the city to be transformed from a machine into a living space that fosters social interaction and reinforces belonging and shared living, particularly in new cities such as Ali Mendjeli.

References

Architecture. (n.d.). *Architecture*. Kenana Online. https://kenanaonline.com/users/Architecture/posts/128357

AT Mzab. (n.d.). Istilhām Le Corbusier min Mzab [Le Corbusier's inspiration from Mzab]. http://www.atmzab.net

Biagi, F. (2021). Henri Lefebvre's critique of Le Corbusier's urban functionalism. *International Critical Thought*, *11*(4), 543–560. https://doi.org/10.1080/21598282.2021.2010587

Castells, M. (1983). *The city and the grassroots: A cross-cultural theory of urban social movements*. University of California Press.

Chihab Ahmed, M. (1993). Al-'Imārah: Asālībuhā wa-al-usus al-naẓarīyah li-taṭawwur ashkāluhā [Architecture: Its methods and the theoretical foundations for the development of its forms]. Dar Mohammed Lawi for Publishing and Distribution.

Encyclopaedia Britannica. (n.d.). *Functionalism (architecture)*. https://www.britannica.com/art/Functionalism-architecture

Hanafy, H. M. A. (2008). *Naḥwa manẓūmat li-tawfīq al-'alāqah bayna usus al-taṣmīm al-mi'mārī: Dirāsah taḥlīlīyah li-muqawwimāt al-'Imārah* [Toward a system for reconciling the relationship between the foundations of architectural design: An analytical study of the elements of architecture] (Doctoral dissertation, Cairo University).

Irfan, S. (1996). *Functional theory in architecture*. Dar Al-Maaref.

Irfan, S. (n.d.). *Architecture of the twentieth century (Part III)*. Egyptian Universities Publishing House.

Jacobs, J. (1992). *The death and life of great American cities*. Vintage Books.

Karef, M. S. (2015). *Lwkwrbwzyyh: Mukhaṭṭaṭāt 'rbyyh ghayr muktamilah* [Le Corbusier: Incomplete Arab plans]. Al-Araby. https://www.alaraby.co.uk

Le Corbusier. (2007). *Toward an architecture* (J. Goodman, Trans.). Getty Publications. (Original work published 1923).

Mumford, L. (1961). *The city in history: Its origins, its transformations, and its prospects*. Harcourt, Brace & World.

Portela, M. (2022). *Architecture or revolution: Frida Kahlo's houses and the functionalist movement*. ArchDaily. https://www.archdaily.com/985159/architecture-or-revolution-frida-kahlos-houses-and-the-90th-anniversary-of-the-fun

Sennett, R. (1977). *The fall of public man*. Vintage Books.

Smithies. (1998). *Principles of design in architecture* (M. B. A. Al-Husayn, Trans.). King Saud University, Scientific Publishing and Presses.

Zitoune, S. (1993). *Twentieth-century architecture: An analytical study*. Al-Ahram Commercial Press.