Permanence to allow Change

The archetypal room: the persistence of the 4 x 4 room

G. Ledent
Université catholique de Louvain, Brussels, Belgium

ABSTRACT: Nowadays, the permanence of architecture is challenged as inhabited spaces become obsolete at an increasingly rapid pace. This obsolescence is mainly due to the fast evolution of ways of life, construction techniques, and aesthetic codes.
Instead of trying to meet point by point those fast changes, another way to address obsolescence would be to consider what is not subject to change in the short term.
Through architecture history, traditional housing types convey a sense of permanence. Through their constant improvement process, types leave aside contingent elements only to retain the essential. This sense of permanence can be traced in early domestic manuals as well as in the housing studies carried out by the Italian school of typology.
In all those housing types, the plans display at least one room encompassing a 4 x 4 meter surface. The permanence of such a room is interesting as it allows functional, technical and aesthetic variations. As such, it allows societal variations and can be a lever for future design.

1 INTRODUCTION

1.1 *A world of changes*

We live in a world of constant changes. Those changes affect the inherent characteristics of architecture. Indeed, as well as various consumer goods, inhabited spaces become obsolete at an increasingly rapid pace. This obsolescence is mainly due to functional, technical and aesthetic transformations. First of all, ways of life evolve at a rate that has never been experienced in human history. Social as well as family relationships have never been as diverse as they are today. Secondly, construction techniques are evolving rapidly. What seems to be forefront construction materials and building technologies are outdated even before being implemented. Finally, aesthetic codes do not achieve more stability as yesterday's fashion is already outdated today.

To address those changes, one could try to meet them point by point (Ledent 2015). But several difficulties emerge regarding that approach. Firstly, it is almost impossible to address those changes simultaneously. Secondly, architecture requires time. By the time a building is built, the changes it was trying to address are already passé. Finally, the changes themselves are ephemeral. Hence, anything that seemed to be relevant one day is soon outdated.

1.2 *Archetypes and contingencies*

For all these reasons another way to address constant change would be to consider what is not subject to change in the short term. In that sense, a distinction must be made in architecture between what is permanent - archetypes - and what is changeable - contingencies. On the one hand, archetypes are defined as the resilient and slowly evolving features of architecture. They are the underlying principles of architecture. On the other hand, contingencies tend to change according to transitory cravings. They are the superficial features of architecture, as they experience a quicker depreciation in time. Consequently, any kind of architecture relying too much on the latter would expose itself to a swift obsolescence.

Archetypes give insight into how to address constant changes in our societies. Indeed, by nature, archetypes display permanent features, beyond change. Therefore, they allow for secondary variations on a functional, technical and aesthetic level.

1.3 *Domestic architecture*

The question of resilience in domestic architecture is particularly relevant since it is by far its most important production in terms of quantity.

Traditional housing types exemplify the permanence of archetypes. The interest of such building

types lies in their very nature. Indeed, the most prominent characteristic of a type is that it is the result of a long and constant sedimentation process of uses and techniques in order to attain the quintessence of local dwelling needs. Therefore, through their constant improvement process, traditional types leave aside contingent elements to retain only the essential, the underlying structure of housing.

In order to best illustrate this, domestic treatises as well as typological analyses are examined.

1.4 *The archetypal room*

Within those domestic archetypes, the room stands out as a resilient feature. Being the smallest dimension in the human dwelling, the room can be considered as the core on which the principle of resilience can be tested.

2 DOMESTIC MANUALS AND TREATISES

Domestic treatises provide a good overview of how housing was thought but also built and inhabited through history. Indeed, even though those treatises claim to be theoretical, they are always based on real cases. Hence, treatises provide a wealth of information on dwelling constitution as well as local uses and social statuses.

For the sake of a framework that is generally representative of housing history, three treatises are examined: Serlio's, Le Muet's and Durand's. The sample selected stretches over a long period of time (four centuries), and has had a tremendous influence on domestic architecture all around Europe. Moreover, all three are richly illustrated.

In order to examine the persistent characteristics of the room constitution, the attention is drawn to the smallest abodes displayed in the three treatises. Indeed, starting from the premise that the archetypal room is a resilient feature of all dwellings, the smallest dwellings must display at least one such room. Moreover, in many cases, those minimal dwellings form a basic layout from which all other housing arrangements seem to emerge.

2.1 *Serlio, Sesto Libro d'Architettura*

Sebastiano Serlio's treatise is particularly significant since it is one of the first architecture books based on illustrations rather than text. Compared to other treatises of the time, his work can therefore be regarded as an illustrated architectural manual. More importantly, Serlio depicts the houses of the poor unlike his forerunners who believed such dwellings did not require any expertise in art (Rosenfeld, 1978).

Two kinds of building plans are displayed in Serlio's treatise: country and urban dwellings. Among them, the smallest country dwellings display a similar floorplan: two adjoining rooms with a front porch surrounded by a garden. Those dwellings demonstrate a series of differences in the construction techniques (wood vs stone), number of floors as well as a risen ground floor.

In his depiction of the plan, Serlio writes about a main room - *stanza* - accommodating the household. Its dimensions vary from 10 to 13 *piede* (3.5 to 4.5 meters, the Venice *piede* being equal to 0.35 meter). Alongside this room, a secondary chamber can be found, housing either a stable (for the *contadino*) or a kitchen (for the *artefice*).

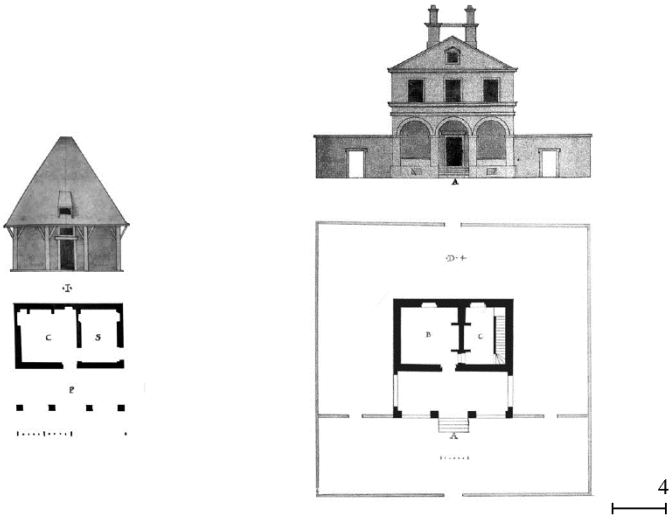

Figure 1. *Casa del povero contadino* and *del povero artefice*

The smallest urban compositions present three double or quadruple row houses of two storeys. Serlio explicitly mentions the fact that they are drawn from real-life examples. Those craftsman houses are located far from the city plazas and places of nobility. They are deep and narrow and are built between two vertical party walls. They all display a main room on the street side with a contiguous sleeping alcove. In the depth, various arrangements can be found with a well, a courtyard and sometimes a vegetable garden.

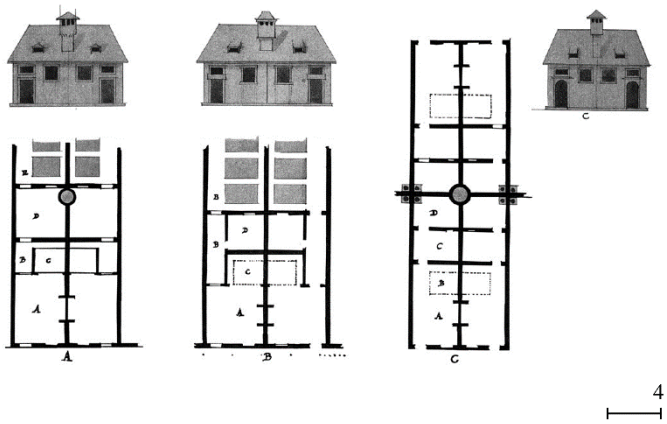

Figure 2. *Casa del povero artifice nella citta*

By definition, urban conditions entail some kind of dwelling congestion. In this case, the houses are stacked alongside the roads. Hence, the width of those houses is crucial in order to provide as many abodes as possible within the city walls. Interestingly, the smallest houses illustrated by Serlio have a width of 10 to 12 *piede* hence, approximately 3.5 to 4.2 meters. Referring strictly to the Italian author, this seems to be a width below which organizing a proper dwelling seems difficult.

The depth of the minimum country houses is equivalent to the width of the urban houses. Those dwellings being the smallest, this gives an indication of the minimal dimension of the room. More interestingly, all the layouts display at least one square room whose sides are equivalent to this depth/width. Hence, all designs display a 4 x 4 meter room. Serlio refers to this room as the *stanza*, the multifunctional family room of the time. It is a place for family gathering, eating as well as sleeping.

In addition to its size definition, the *stanza* does not present any systematic design in terms of openings or technological means. Indeed, the number, the size and the placement of the windows and the doors are different from one version of the treatise to another. Similarly, the positioning of the hearth varies from one version to the other. Hence, the topological configuration of the room seems to prevail on formal or technical contingencies.

2.2 *Le Muet, Manière de bien bastir pour toutes sortes de personnes*

Analogously, the book published by Pierre Le Muet in the 17th century can also be referred to as a housing manual. It displays various designs for town dwellings that range from very narrow houses to large palaces. They are classified according to *la place,* the width of the lots they occupy.

The first two drawing boards display multi-storey houses. They are set on a 12-*pied* wide plot (4 meters, the French *pied de la toise de l'Ecritoire* being equal to 0.33 meter). Both designs present a combination of interior rooms with a backyard. The staircase is not included in the interior spaces but it is placed at the rear of the dwelling. It can then be accessed through a corridor on the ground floor. This disposition enables the rooms on the upper floors to have a maximal width of 12 *pieds*. The main difference between the two houses can be observed in the depth of the lots that vary from 21.1 to 25 *pieds*. In the deeper design the additional depth is occupied by an additional *cabinet*.

The *première place* proposes one room on every floor of the house. Its size ranges from 9 x 14 *pieds* (3 x 4.6 meters) on the ground floor to 12 x 14 *pieds* (4 x 4.6 meters) on the upper floors. The *deuxième place* displays comparable rooms to which a narrow cabinet has been added on the side of the courtyard.

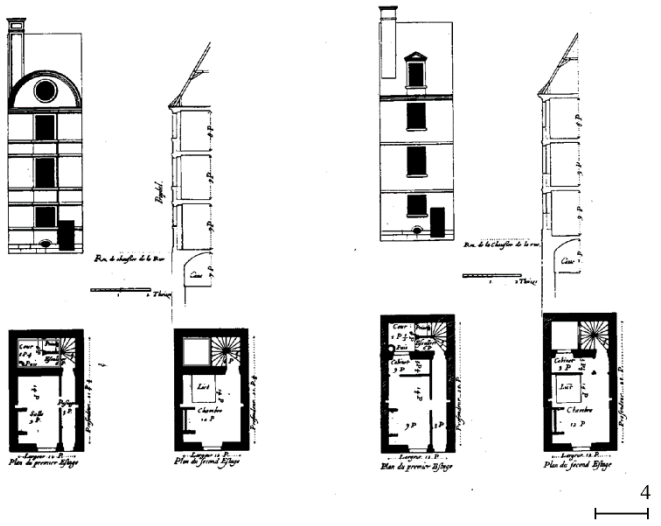

Figure 3. Le Muet, *Première place* and *Deuxième place*

Interestingly the same remark applies to both Serlio's urban houses and this case. Indeed, Le Muet does not present any housing design for an interior width of less than 4 meters as if it was a minimal width to conceive a proper dwelling. Once again too, the houses display at least one room encompassing a 4 x 4 meter surface.

2.3 *Durand, Partie graphique des cours d'architecture faits à l'école royale polytechnique*

In the early 19th century, Jean Nicolas Louis Durand had a tremendous influence on architecture through the publication of his *Recueils*, his *Precis* as well as his *Leçons*. In his books, Durand presents a systematic and rational classification of buildings and building elements. As such, Durand's illustrations were meant to serve as design examples, as a generative typology.

Among the various building patterns displayed in Durand's illustrations, the *maison à neuf cases* stands out as a prototype of a generic house. It is illustrated both in the *Leçons* and the *Precis* where the French author presents various alternatives of the house with different construction techniques. While the exterior appearance of the building varies from one construction technique to the next, the floor plan always remains identical.

The house is designed as a two-storey high square composition with a risen ground floor. The plan is very plain. It displays a nine-square grid drawn on a 4 meter pattern presenting two different sizes of rooms: 4 x 4 and 4 x 8 meter rooms. The rooms are arranged according to an *enfilade* principle. No corridors can be found as all rooms are directly accessed from the neighbouring chambers. The composition is very regular and symmetrical. All openings (windows and doors) are equivalent in size, around 1 meter, the sole exception being the front door which is slightly wider. The openings are arranged in one line centered

on each room. Minor differences can be found between the *Leçons* and the *Precis*. These relate to the proportion of large/small rooms and the presence of a staircase.

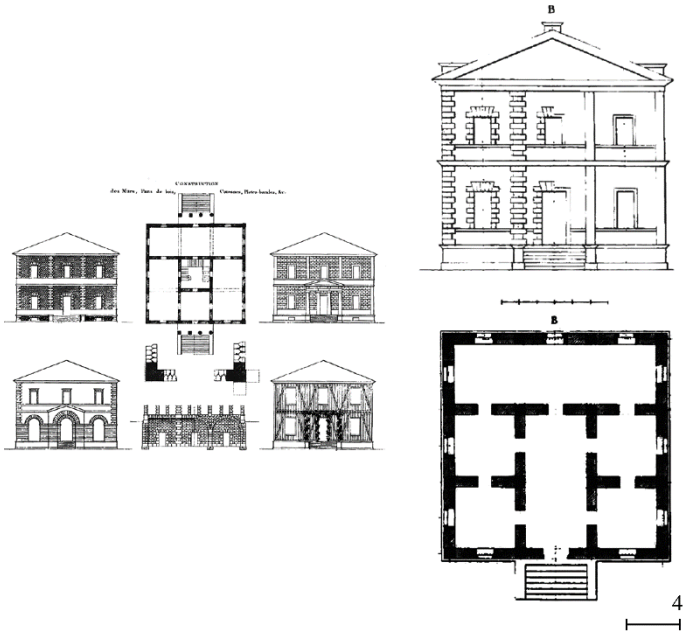

Figure 4. Durand, *La maison à 9 cases*

Interestingly, in this theoretical exercise, Durand focuses directly on the 4 x 4 meter room as the basic module for designing his house. The spaces have no predefined function as if that pattern was able to shelter any kind of program.

2.4 *Resilience*

This analysis highlights the resilience of a 4 x 4 meter room in domestic treatises. It can be regarded as a basic feature of housing design. In addition to this resilience, this room is remarkable in three other respects.

Firstly, in terms of dimensions, this particular room is able to accommodate any kind of living needs from the polyvalent family room - *la Salle* or *la Stanza* - to bedrooms ... No exclusive functional determinism can be found in this layout.

Secondly, it does not seem to be affected by construction technologies as Durand's proposal clearly exemplifies.

Thirdly, the openings - doors and windows - or any kinds of artefacts that might possibly influence the looks of the space are very diverse. They do not seem to guide the layout of the room.

Hence, this room appears to be a permanent feature able to accommodate variations on a functional, technical or formal level. On this basis it can be regarded as a genuine archetype.

3 THE ITALIAN SCHOOL OF TYPOLOGY

Even though domestic treatises are rooted in empirical studies, they remain theoretical. Hence, another way to analyze domestic types would be to look into what customary domestic architecture has produced in practice. In our western societies, it is generally acknowledged that vernacular types have ruled upon the production of domestic architecture until the 1920's with the advent of modernism. Arguing for a *tabula rasa*, modernist architects tore apart the conventions of the traditional types along with the qualities that local experience had carefully stored in them over the centuries.

Authors such as Amos Rapoport or Ulrich Doepper have explored the scope of vernacular architecture quite thoroughly. But although their analysis is richly documented, it is not systematic. Conversely, the Italian school of typological studies based on Saverio Muratori's method was the first one to carry out a systematic analysis of traditional housing types. Although initially limited to the Italian peninsula, they provide a good overview of the constitution as well as the genesis of traditional housing types before modernist architecture.

3.1 *A method*

Saverio Muratori's method relies on an analysis of manmade artefacts in order to extract its principles of behaviour, formation and alteration. Those principles define the inherent characteristics of each manmade structure. Bringing to light those principles is essential as they act as a reference system for any sociocultural environment. Muratori and his successors pay specific attention to the traditional and most common building fabric. Unlike the Nolli plan, they do not limit themselves to monumental architecture.

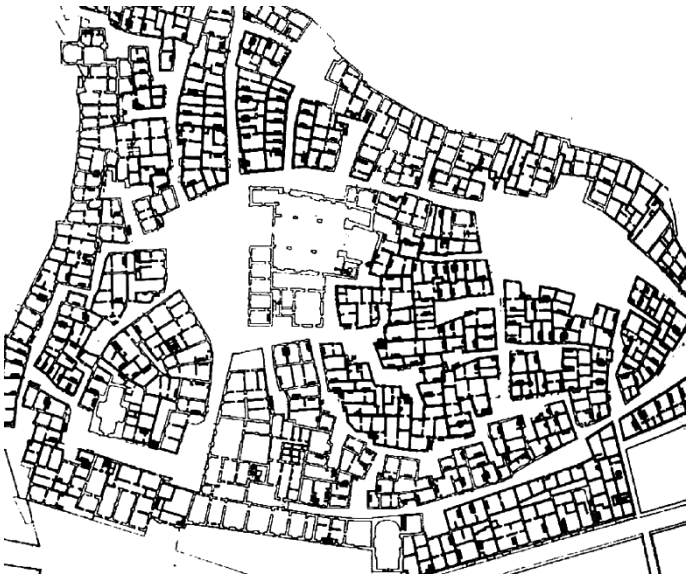

Figure 5. Polignano a Mare, survey by Caniggia and Maffei

Once those principles are revealed, they can be a keystone for future design. Instead of introducing alien ideas as the modernist movement did, the typological method proposes to design as a continuous interpretation of what already exists. This method presupposes that any architecture project could be closely linked to a prior and thorough typo-morphological analysis.

3.2 *Caniggia, Maffei, Lettura dell'edilizia di base*

Gianfranco Caniggia and Gian Luigi Maffei continued the analytical work started by Muratori. Their book, *Interpreting basic building*, tries to shed light on the immanent laws of the creation and development of manmade structures on various scales: building, city fabric, town and territory.

The focus of this paper will only be on the building scale. According to Caniggia, the major shift caused by modernism can be traced into the way it proposes to understand and produce buildings. He makes a simple distinction between buildings and architecture. On the one hand, buildings constitute the general and anonymous built context. Caniggia refers to buildings as a spontaneous production. Buildings are artefacts erected without the builder having to think twice. As such they are frequently disregarded by scholars. On the other hand, architecture relates to specific emergences. They are signed buildings usually commissioned by the ruling power (e.g. the detailed buildings in Nolli's plan). However, with the advent of the modernist movement, this distinction is no longer meaningful since all buildings are considered as possible emergences. The Italian theorist proposes hence to constrain those emergences and produce buildings that relate to the continuity of typological processes.

The analysis of the creation and development of building types carried out by Caniggia is both syntopic as diatopic as they are found in Florence, Rome and Genoa with comparisons with Como and Milan. The Italian author tries to understand the genesis of local types through a systematic study of ancient building fabrics.

Among basic buildings within the city, the row house - *casa a schiera* - is the most common building type. As such, it can be regarded as a less personified roman *domus*. In their analysis, the authors trace back the origin of the row house to a common root, the mono-cellular dwelling house. This basic root can be considered as the *foundation matrix of the typological process* (Caniggia and Maffei, 2001).

The origin of such mono-cellular dwellings is the elementary cell (e.g. the night shelter in the pastures). Remarkably, this basic cell can be considered a genuine and complete dwelling. Hence, it can by definition accommodate all human needs on a functional, technological and formal level. Indeed, it is able to shelter the functions of family life; provide the dweller with a protective and steady construction; and produce the image of what is acknowledged as a dwelling in the collective consciousness.

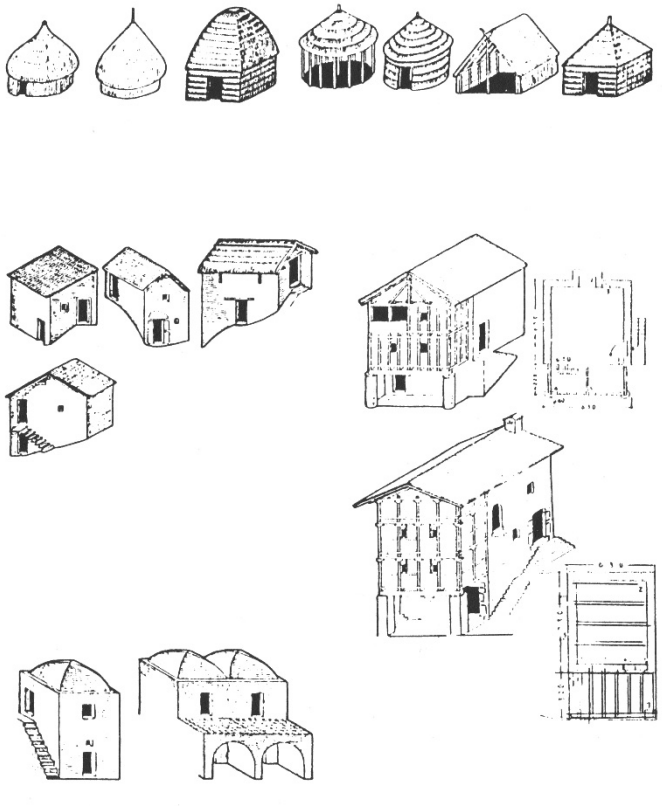

Figure 6. Basic types

Based on this assumption, Caniggia presents the evolution of urban housing in Florence Rome and Genoa as an evolution of this elementary chamber. According to the Italian theorist, this elementary cell can take various forms but always presents a surface of around 25 square meters.

Yet, looking closely at Caniggia's drawings, two elements can be noticed. First of all, the grid on which all the dwelling evolutions are analyzed is a 5 x 5 meter grid. However, all the dwelling walls are drawn on the inside of the grid. Assuming that such a party wall is about 30 cm, the dimension of the basic cell is 4.7 x 4.7 meters in Rome and Genoa while it is 4 x 4.7 meters in Florence. Moreover, in the multi-floor dwellings, the position of the staircase reduces those dimensions by the width of a flight of stairs. In such dwellings, the average width of such a flight of stairs is approximately 70 cm. Those stairs are placed either perpendicular or parallel to the street, reducing the size of the *sala* to a minimal 4 x 4 meter surface. In that regard, the specific analysis of Florence conducted by Caniggia (Caniggia, 1994) adds to the validity of this observation. The *casa a schiera* is presented as an evolution of the *corte-schiera* that displays a minimal distance between the centers of the party walls of 4.5 meters.

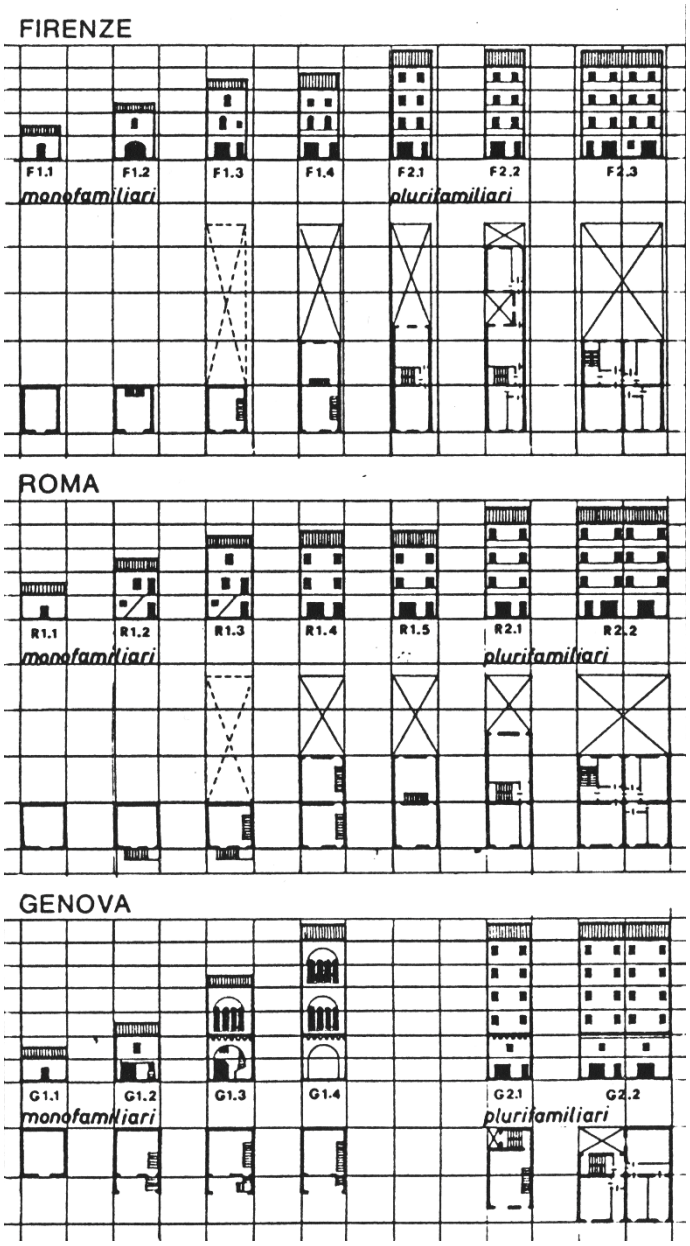

Figure 7. Diachronic mutations of the basic type

3.3 *Resilience*

Once again, looking at the smallest dwellings, the 4 x 4 meter surface seems to be a constant.

Interestingly, the traditional types exposed by Caniggia have survived and are still inhabited today. More interestingly, none of them are occupied the way they used to be a century ago. Indeed, ways of life have evolved, technological knowledge has developed, and tastes have changed. Yet, thanks to their polyvalence, those dwellings have passed the test of time. Hence, they have proven to be genuine archetypes.

As is the case with the examples exposed by the Italian school of typological studies, the same applies to various types around the world. Traditional building types, through their constant improvement process, allow inner variations on three levels. Firstly, they permit secondary alterations on a functional level. Types do not respond unilaterally to function. On the contrary, they display topological interactions rather than functional ones, syntactical associations rather than semantic ones. This characteristic has allowed local types to be reinvested throughout the ages with new functions or other ways of life. It is the case, for example, with the traditional Dutch *herenhuis*, or the Belgian bourgeois row house of the turn of the 20th century.

Secondly, types allow transformations on a technical level. In most traditional types, structural or technical issues are dealt with genuine architectonic means and not with technology added to the building itself. That is the case, for instance with the *haveli*'s wind pavilions in Jaisalmer, where natural cooling is comprised within the genotype of the house.

Thirdly, types enable evolutions on a formal level. In that regard, traditional European housing types do not command the building's exterior appearance. For instance, Riga's traditional 19th century housing revolves around the same floor plan with a high variety of façades distinguishing the city for its *Art Nouveau*'s identity.

4 CONCLUSION

In a world of constant revolutions, instead of dealing with them directly, a new paradigm could be sought: addressing resilience. This resilience states that the permanent structures of architecture work as a framework (Leupen, 2006a) within which change can occur. This approach can be paralleled with other disciplines such as anthropology or linguistics that claim that deep structures of human behavior exist allowing for cultural or temporal variations.

In the field of architecture, those deeply rooted structures are called archetypes. Archetypes can be regarded as a *degré zero* of architecture. They form a resilient frame within which change can occur on a functional, technological and formal level referring directly to the three founding principles of Vitruvius. Moreover, this resilient frame can also accommodate variations on an individual level, allowing for personal interpretations.

To comprehend those archetypes in the specific sphere of domestic architecture, time-tested housing designs have been looked into through the study of several treatises and typological analyses. The choice of domestic manuals and traditional types is no innocuous exercise. Indeed, by definition, both leave aside contingent elements to retain only the essential. Hence, they are particularly relevant in the light of a quest for archetypes. Interestingly, the examples explored revolve around a basic dwelling cell encompassing a minimal surface of about 4 x 4 meters. The permanence of such a room in the smallest abodes demonstrates its necessary presence to sustain human dwelling needs. But this permanence also reveals its capacity to accommodate changes on various levels

since those designs were able to pass the test of time. As such, this archetypal room can hence be considered as a key element for future sustainable housing designs.

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