

## The “demonstration city”: a model from a global architectural process

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**Abstract.** *This research springs from the idea that the human-built environment, from its origin until today, is the result of a constantly developing process. Throughout this progression, one can observe the evolution of the courtyard house as if it was an architectural organism, that has now followed more than two thousand years of unfolding of human building, from the formation of the fence (interpreted as a primitive construction) till the latest innovations of housing and urban research (latter combining elements of various cultures and ages). As society has been growing and changing – recently more rapidly than ever before in history – so has the development of courtyard house, always in tight correlation with the population’s ever changeable needs. From this analysis arises a hypothesis about the dynamics of this process (a theory already established by Muratori), of which ideas materialized in practice have been most profitable for contemporary urban design. Organized within a model called “demonstrative city”, the resulting layout is a blueprint of a simplified urban environment. This system serves as a tool capable of inserting the beneficial aspects extracted from this research into the urban environment, which further confirm the validity of these results. For this reason the “demonstrative city” can’t be considered as a project, but more so as a simulation of urban reality. Establishing this as a tool in architecture will be the first step to its test in the urban project.*

*Keywords:* Architectural process, courtyard house, urban morphology.

### Introduction

The research briefly summarized here - which was carried out as part of the DiAP Department of Architecture and Design’s PhD in Architecture and Construction (DRACo) at “Sapienza” University of Rome, supervised by Professor Giuseppe Strappa and published in the volume *Architettura di recinte e città contemporanea. Vitalità del processo formative delle strutture a corte*<sup>1</sup> - moves beyond an analysis of the formation and transformation process of the courtyard house organism (identifying logical, constructive and spatial changes that are still relevant) to the most avant-garde urban planning criteria.

This investigate analyzes the designing possibilities given from an housing type that, from its origins till today, diffused itself all over the world. In this case the globalization, in the positive significance of the term, could be considered not only a contemporary phenomenon but also an historical one linked either to the invasions of the Roman Empire and its consequent diffusion of his “way to live” than to the extremely flexibility of the courtyard house to resolve the cultural dwelling needs of very different kind of cultures: from the Chinese Buddhist culture, to the Muslim of north Africa and Asia, to the Mediterranean cultures<sup>2</sup>. In my opinion, because of its diachronic and diathopic spread out this type could be studied

to solved project problems starting from the consideration that the critical design moment is a process, as a process is the formation and transformation of a building type. The case of the courtyard house is maybe the only process which take the whole development of human history and in the this process we can analyze each typological results, giving us several possibilities of conceiving the domestic space and his relationship with the urban space.

### Methodology: the patio house process

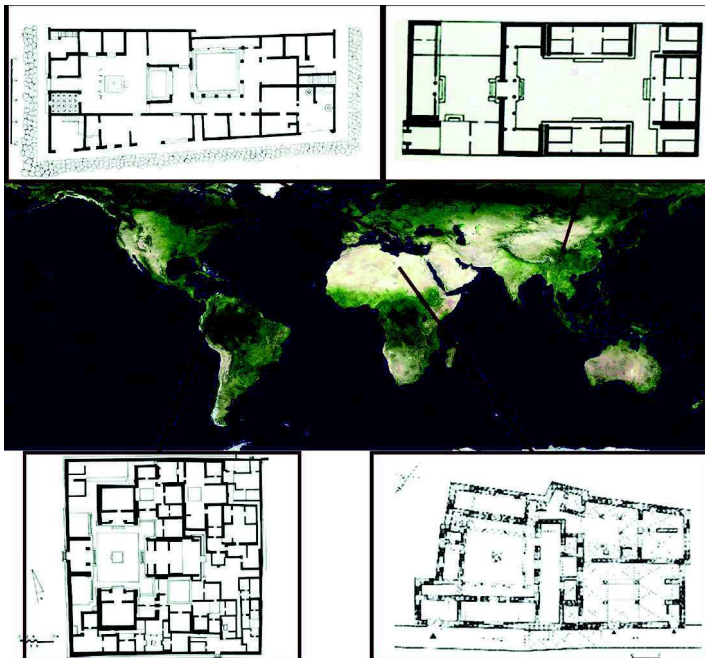
Starting from the consideration that the environment transformation by humankind is the result of a process that stems from the basic tectonic actions of fencing off and covering, and that these led to contemporary examples of urban architecture (Strappa, 1995), we can identify courtyard houses as a perfect case study of this. This form of dwelling has proved itself able to evolve and meet the changing needs of the society over time, both when such areas have undergone growth and expansion as well as contraction, continually updating itself and adapting to new conditions, ending up by perhaps constituting the only example

of an architectural form that has been able to cross all the different cycles of transformation undergone by the constructed world.

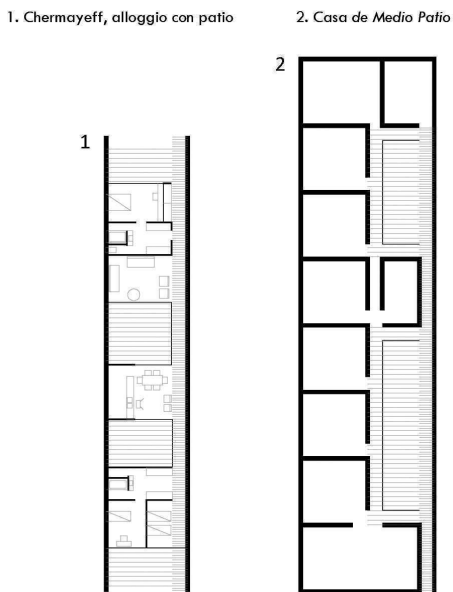
The analysis initially addressed those moments in the process that generated the courtyard house form that derived from “spontaneous” changes (with, however, all the provisos that such a term demands), i.e. those associated with Man’s natural disposition towards recognizing, repeating and updating of principles found in the constructed landscape. Nevertheless, the “spontaneous” world increasingly exhausted its fundamental role, particularly after the industrial revolution, at least in the Western world and as far as most of the components that make up the urban environment are concerned, giving rise to construction developments that were increasingly linked to an architect’s critical contribution.

It was thanks to this heightened critical approach that the courtyard house was updated during the course of Modernist experiments, giving rise to many diachronic variations and new patio forms that were also the result of a process (Strappa, 1989) of continual changes based on new research conducted with the urgency of changing needs.

Thanks to the influence of the Modernist movement, this housing typology was exported in different geographical areas, and starts his globalization process. In some cases, as in latin America, the modern products find the typological process results whose morphology derives from several spontaneous transformations who adapt the housing structures to the new way to live the house and the city. An important meeting between the spontaneous courtyard houses and the design products of the modernist approach is the case of the PREVI Lima Design Contest. In this contest were invited ones of the most important European and North-American architects and it were specifically asked to define a new neighborhood made by buildings directly connected with



**Figure 1.**  
Spreads out of the courtyard house



**Figure 2.**

**Confrontation between the 'linear patio house' and the casa de medio patio**

the housing culture of the country. In general, Lima and Latin America is deep linked with the courtyard house, imported in the country during the Spanish colonial period (XVI sec.). The type it was imported is a structure close to the Roman Domus type producing very low-density urban fabric. From the end of XIX century, during the European immigration, this structures supplies a densification process called from F.E. Diez<sup>3</sup> of "reduction-multiplication". It means that the houses, in order to host a greater number of inhabitants, reduced their dimension dividing into two parts the casa de patio, forming the casa de medio patio o casa chorizo<sup>4</sup>. This is the main type in Lima during the PREVI contest and is the type studied from the participant to respond to the request of the competition.

In the same period another planimetric configuration, in strong analogy with the spontaneous development of the Latin American casa de patio, comes from a process that follows the development of the row-house type but is also recognized in the housing body of the "linear patio" type, intended as an element of the row group that develops the area of pertinence within the body of

the building. This type of building has been developing in the Western world since the publication of the studies of Alexander and Chermayeff in *Community and Privacy*<sup>5</sup>, which define a binuclear patio type developed in different variants. These studies identify six areas of public and private life and evaluate the relationship between the concept of house and the city starting from the definition of the requirements arising from the need for privacy. The critical points, starting from the analysis of the relationships, stay always in the transition space between the public and semi-public as well as between the semi-private and the private. From a design point of view they determine a range of solutions which are defined as: filters, bearings, diaphragms, dams, transition points.

The product, resulting from these studies, consists of a building structure that contains some characters in analogy with the results of the spontaneous Latin American<sup>6</sup> process and therefore used by many authors to meet the demands of the PREVI competition taking place in Lima in 1969. This competition marks a very important step for the research on housing and becomes the operating base of many project results among which, a great number of experiments which are based on the linear patio type as a typology related to the local architectural tradition. The publication of the results of PREVI competition marks the moment of the greatest spread of this type of building which will be developed in many regions while keeping constant its morphological characters even in the most contemporary examples. When the analogy with the Latin American process is mentioned, the reason is the use of the patio as the centralizing element of the type that allows to look out the entire unit housing to its interior and to filter the relationship with the other units in its totality.

Alexander and Chermayeff use the patio in the same way by shifting the problem from the relationships between the residential units to the relationships between the various rooms of the house.

The theoretical proposal of the two architects embodies a systematic simplification of these filters, that is solved by many authors in a field

of spatial subdivision (instead of visual) of the environments both in sleeping and the living area.

The linear patio type is an interesting study case because puts in relation two housing organism deriving from two different process: the spontaneous one and the critical one. In this case both typologies are modern, considering that the casa de medio patio were greatly used in '70s in Latin America.

A different consideration derives from the comparison between the modern patio type and the original courtyard house. In this case modernist architects take inspiration from an important characteristic of the courtyard house and re-interpreted this element designing an housing type whose nature is completely changed. The characteristic who remains in both typologies is the fence who allows the house to be totally turned into the inner open-air space. But the important difference between them, is the significant of the inner open-air space which in the courtyard house is the real distributive center which connect every rooms of the house instead in the modern patio house it becomes an optional space and the distribution is completely conceived within the house.

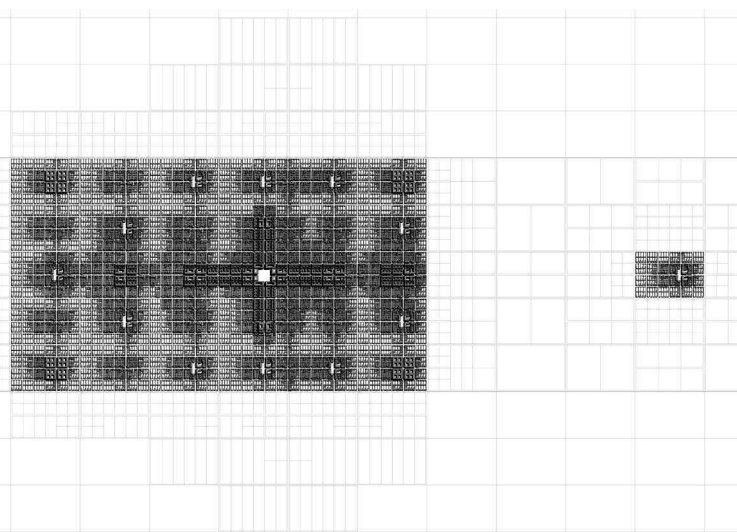
Both the linear patio house and the patio house achieve resounding success and we find many examples of these typologies all over the world: from north Europe to Spain, from China to United States and Latin America, till north Africa. Although many of the countries, in which these modern typologies have been spread out, own some heritage, in their housing culture, deriving from the courtyard house, these typologies were able to enter in the way to live of many places not accustomed to this kind of housing structure, just really thanks to the influence of Modernist movement in the world.

These updated architectural forms should be studied, in that they are features that can create urban fabric, analysing the various ways they bring people together and their relative urban possibilities.

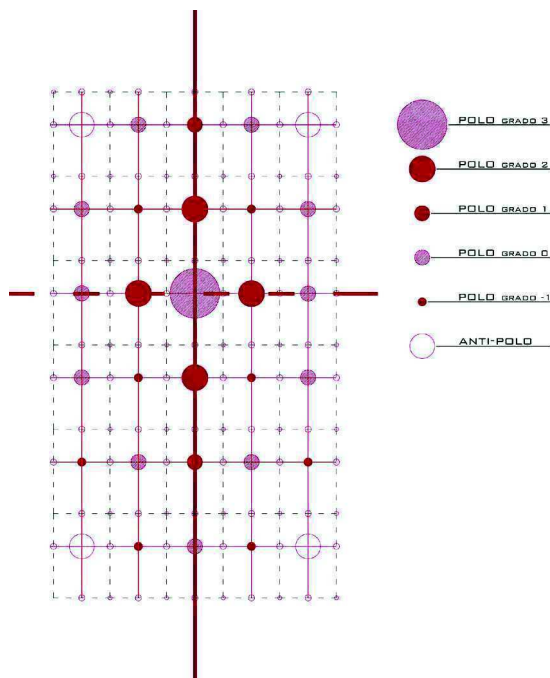
### The “demonstration city” an experiment on the building process

Having started with this preparatory study phase, we were able to formulate a few theories regarding the development of this process, based on research carried out by the Muratorian school. These results were standardized as part of a model, dubbed the “demonstration city”, which attempts to simulate particular aspects of the constructed world using a selected series of simplifications, as with all scientific experiments. The resulting theoretical model selects moments and phases in the process under examination, relating them to synchronic conditions, so as to verify its in vitro suitability as part of an urban system of average complexity. The “demonstration city” should not therefore be considered a complete design but rather a partial simulation of urban reality, a theoretical work-in-progress laboratory designed to develop a contemporary courtyard house process and the possible specializations that, thanks to fusions and adaptations, can produce new construction forms on an urban scale.

Nevertheless, it should be made clear that the transition from interpretation to design necessarily involves a certain amount of abstraction, so that the behaviour of buildings, groups and forms can be generalized and used, within certain limits. It is clear that this transition presupposes, as with every branch of



**Figure 3.**  
The ‘demonstration city’



**Figure 4.**

**Logical scheme of the formation of the ‘demonstration city’ conceived as a macro fence. Within the principal fence the neighborhoods are formed as micro-fence based on the same characteristics: a principal axis and a secondary axis which form a polarity**

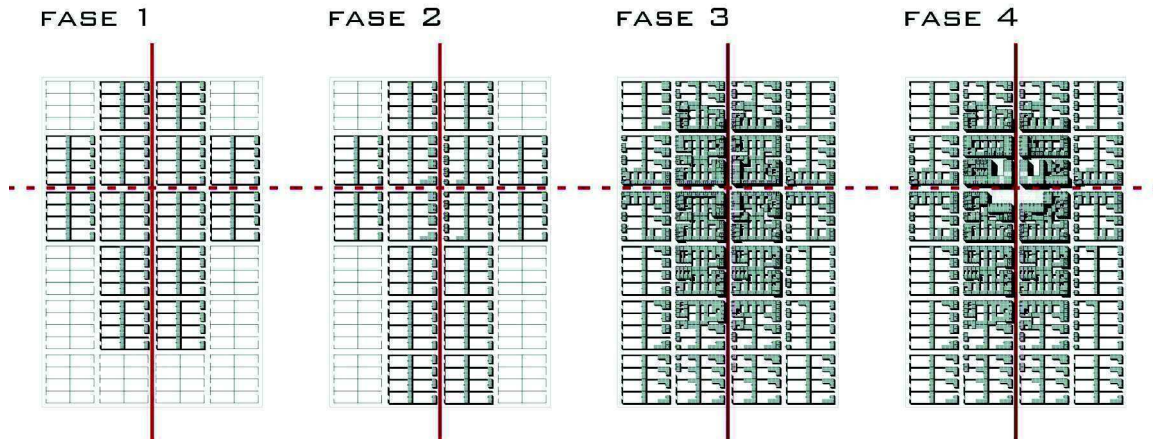
science (or even just of knowledge), a series of simplifying hypotheses that whittle down the data - gathered from real circumstances and taken into consideration - to what is considered essential, for the purposes of the research. It also entails accepting that the general pattern that emerges will itself be an abstraction.

I have dubbed this abstraction a “demonstration city” in order to highlight its very oversimplified nature compared to constructed reality as well as its value as a proposal compared to some (and just some) features of urban buildings, whilst being well aware of the fact that a city can be founded on the principles of enclosure and binding together, but needs a different level of complexity if it is to become a real organism, which must be achieved by combining other fundamental components, such as infrastructure, parks etc.

This “non-design” hypothesis, which in some way is contrary and complementary to Muratorian re-planning methods, requires further explanation. The analysis of the process that evolved the courtyard form, whether it was “spontaneous” or the result

of a critical town planning process, would seem to show that it has been able to meet urban needs at given times, from the level of population density to identifying buildings that can incorporate specialized non-residential functions that are essential in making sure a city works properly. Such results emerge as part of this process at times that are often quite distinct from each other, in order to meet the various different needs of changing societies. More specifically, we can state that, if on the one hand, many of the processes analyzed (particularly typological processes) can seem entirely outdated nowadays, on the other hand we must accept - based on our experience of modern cities - that urban history does not head forward in one single, gradual direction; it identifies a process that takes place in stages and many of the features identified in past transformations reappear in an updated version, as innovative and contemporary answers to new urban needs. As far as this aspect is concerned, we may refer, for example, to recent trends that propose the “recycling” of existing building stock with a view to restoring it and adapting it to new functions and purposes. It should be noted that at this current time of economic crisis, innovation can consist in this sustainable re-use of existing building stock, in line with a practice that had been widely employed, for that matter, in the sixth century, with the conversion and re-use of ancient “architectural material”: turning temples into Christian churches, transforming parts of the urban fabric consisting of residential buildings into more organic systems that went into making non-residential constructions. The recycling of existing building stock is just one example of a return to past construction practices and the list could become much longer if we were to analyze, for example, the expedients employed to reduce air pollution or make buildings more energy-efficient.

In this case, the analysis of the evolutionary processes affecting the courtyard form revealed various different aspects that could be linked to the urban fabric’s contemporary needs. Starting from the beginning of our analysis and going over the main moments in these processes, we can highlight a series of aspects and characteristics that are now essential when



**Figure 5.**

**Logical formation of the micro-fences conceived through the densification of the fabric according to the proximity to the polarity**

planning modern urban areas.

The transformation of the domus (Caniggia, 1976) into a commercial base is in itself a highly modern characteristic. Today, the best newly-designed urban areas tend to mix commercial and residential buildings and avoid the development of mono-functional urban organisms, that de facto become overcrowded or empty, depending on the particular times of day when they carry out their purpose (or not, as the case may be).

If we proceed with our analysis of this process, we end up by studying the onset of multiple occupancy (Caniggia, 1976). In this case, as before, this can become a valid reference in order to meet contemporary needs. Clearly, we are not referring to the grouping together of single cells where an entire family resides in just a few square feet of space, but rather how such buildings can teach us to determine shared space. Living in an insula meant sharing social areas and service areas (the courtyard) and today this way of living is being experimented in the co-housing projects of northern Europe's most avantgarde buildings. Today, co-housing constitutes a system that can optimize space, meet the needs of new households and new lifestyles, save energy and ensure eco-sustainability, all as part of the same project. The system of insulae and their medieval evolution could therefore prove to be a valid logical and structural reference that, for its part, boasts the merit of representing

a building that is the result of a change that was dictated by social and economic necessity, honed by events that repeated themselves continually until they formed fully-developed organisms that could entirely meet the needs of that particular time. If we continue to consider the multiple occupancy process, we can glean useful indications as regards the structure and relationship between public, semi-public, semi-private and private areas and how the relationship between them often needs to be mediated according to the different functions of a dwelling but must be entirely appropriate to it.

In continuing with our research, we ended up with a study of commercial buildings that was based on the concept of enclosure and, in particular, an analysis of the relationship that exists between apartment blocks and buildings derived from the courtyard house form (Strappa, 1989). We noticed that this relationship is based on a distributive and structural analogy (such as Palazzo Romano created from the adaptation of row-housing) but in some cases it can be a direct kind of process-linked relationship, as in the case of Como's Palazzo, for example. If we hope to glean guidelines for contemporary urban planning, such a reference could seem unsuitable. However, yet again, we are not looking at the Palazzo as a building but rather as an architectural organism, and therefore its structure and its rationale. From this point of view, we can therefore detect the Palazzo

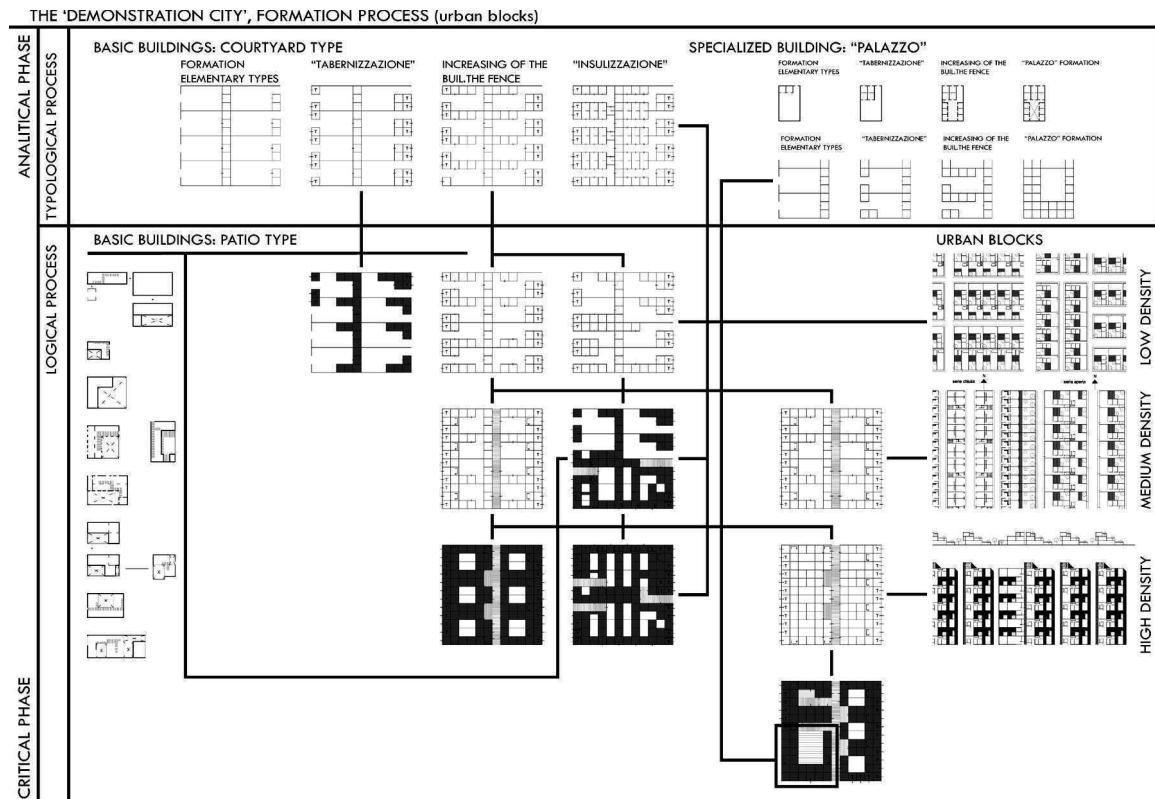


Figure 6.

Formation scheme of the urban blocks. In the scheme are shown the connection between each process analyzed and its results in the model of the 'demonstration city'

form in a number of contemporary examples (Strappa, 2014) of commercial buildings and evaluate the ways they may meet current needs.

There's no doubt that the permanence of the Palazzo's characteristic features is significant proof of the value of such an organism, as it has been providing urban solutions for over six centuries now, but perhaps an even more interesting fact is provided, yet again, by the relationship that this type of building creates with its urban surroundings. If we consider the Palazzo as an organism produced by a process, we cannot ignore its main stages. We have already seen how it is the result of the adaptation and fusion of basic elements, like all non-residential buildings. This fusion de facto revolutionizes the urban area within the city block, conferring the new commercial building with important features. If the building has been formed in response to the concept of urban fabric that becomes part of an architectural form, it follows that the spaces it creates contain a public connotation in their DNA that is hard to find in other types

of buildings. This intrinsic fact makes areas in the Palazzo easily traced back to public or semi-public places, indicating an extreme level of flexibility from this point of view. It is in this way that the building's courtyard becomes a city square, whether it is inside or outside (depending on the level of coherence that the form achieves within its development process) or, by keeping the same structure, constitutes the central area of a form that leaves public areas (virtually speaking) at its doorstep.

### Conclusion

The experiment linked to this research attempt to propose yet again, in an organic and synchronic way, many of the stages described above, blending them in such a way as to link them to the contemporary needs of urban space. We believe that a strict isolation of the results of this analysis, which can be used in contemporary urban planning, would be a risky method that could end up

producing an incoherent patchwork of facts that have no meaning when detached from the structure that made them, over and over again, part of a complex organism made up of a combination of inseparable systems. In order to avoid risking such an outcome, we have attempted to identify a method that starts with those useful facts but nevertheless keeps them linked to the urban systems, at least from an organic and structural point of view, from which they cannot be separated. The aim is to verify the planning potential of a process-led interpretation of buildings and evaluate the real contribution that an understanding of the mechanisms transforming urban organisms can make when creating a logical and structural basis for the expansion and transformation of urban and non-urban environments. As with any scientific model, the basis of such a tool presumes the existence of a method of analysis and a system for data collection that allows the forecasting of how inferred results will develop. Based on such provisos, the “demonstration city” can be considered a model based on simplifying hypotheses generated by the observation of reality that on the one hand constitute its scientific basis and on the other hand distance it from the idea of “design”, in the architectural sense of the word. It should be clearly highlighted that such a model, the initial result of an open form of research, contains - I believe - enormous potential, as well as limitations caused by the very concept of a “scientific model”. In this particular case, the environmental as well as infrastructural systems were simplified, both structural aspects of urban areas and their fabric, concentrating only on urban and functional data linked to the idea of an organism based on the concept of enclosure. The verification of the design’s influence on urban reality will therefore both allow us to evaluate the extent to which the model works and to find tools to reduce the level of abstraction, expanding functional characteristics and terms.

## Notes

1 Amato A.R.D. (2017) Architetture di recinti e città contemporanea. Vitalità del processo

formativo delle strutture a corte (Franco Angeli, Milano)

2 Amato A.R.D. (2017), Op. Cit.

3 Diez F. E. (1996), Buenos Aires y algunas constantes en la transformaciones urbanas, (Editorial de Belgrano, Buenos Aires)

4 From the casa the medio patio the densification process follows until to define high density and multi-storey buildings. See Diez F.E. (1996) Op. Cit.

5 Chermayeff S. (1963), Spazio di relazione e spazio privato: Verso una nuova architettura umanistica / Serge Chermayeff, Christopher Alexander; Traduzione di Giuliana De Carlo (Il Saggiatore, Milano)

6 Strappa G. (1995), Unità dell’organismo architettonico, note sulla formazione e trasformazione dei caratteri degli edifici (Dedalo, Bari)

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