5th ISUFitaly International Conference
Rome, 19-22 February 2020

PROCEEDINGS

edited by
G. Strappa, P. Carlotti, M. Ieva
with the collaboration of
F. D. De Rosa, A. Pusceddu

URBAN SUBSTRATA & CITY REGENERATION
Morphological legacies and design tools

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The fifth Isufitaly Conference will focus on the notion of the substratum in its various aspects.

First, the typological one, as a set of rules inherited from the built landscape that allow reading and conscious transformation. We cannot reduce, of course, the complexity and richness of our ancient heritage to universal interpretational patterns that classify types and processes in a kind of taxonomy of the Ancient (that is true for any built environment). Instead, the identification of a few common criteria that allow us to interpret these phenomena through an architect's eyes, tracing the many outcomes back to the general rationales that produce them, can prove useful to morphological studies.

Then, the physical shape of the historical layer, which in many ancient cities has determined the structure of the current settlements. Substratum is, from this point of view, the part beneath the current built landscape that has no longer a function but still contribute to the form of new fabric. It is the prolific layer that gives rise to multiple organisms. We could then consider a 'substratum' as the composition of elements that once belonged to a built fabric or architectural organism. 'Substratum' despite having lost both their relationship of necessity that bound them together (their purpose and original organicity), and the continuity between the different phases of change and development, still transfer specific characters to the buildings originated by them.

Finally, the intangible aspect, the heritage of projects, experiences, and researches that constitute the working legacy on which current study can be based.

The notion of substratum could be, therefore, more than a specific issue, a way of seeing the built reality useful to the contemporary project.

The term not only includes the ideas of rooting and transmission; it also refers to the means, the tools we can use to reach the essence of the form, of its universal being. This universality, a quality that the actual building did not possess, constitutes a fertile abstraction: a reading as well as a project, how we give a new unity to the multiple and scattered forms of the remains we have inherited.

Furthermore, another theme, which is complementary to the substrata one, is that of urban regeneration. It is a topic extensively investigated by urban research which, in this context, could be reconsidered differently and innovatively.

In continuity with the previous Isufitaly meetings, the theme of the conference proposes a debate on the topics of the urban form transformation at different scales, in the light of our cultural heritage understood as a design tool.

The conference will take place at Palazzo Mattei di Giove, built on the ancient remains of the Teatrum Balbi, in one of the Rome areas where the relationship between the present city and the ancient substratum is more evident, even in its contradictions (the Porticus Octaviae, the Teatrum Marcelli, the archaeological area of Largo Argentina).

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Conference Themes

Urban Form Theories

A.2 Urban Form Theory

Urban Form Reading

A.1 Urban Substrata and New Meanings
A.3 Urban Morphology and Planning Tools
A.4 Landscapes in Transformation
A.6 Ancient and New Public Spaces
PH.1 Urban Morphology in Historical Context
PH.2 Urban Regeneration and Social Issues
PH.5 Urban Morphology and Education/Methods and Spaces

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PH.3 Reading/Design Strategies
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A.1 Urban Substrata and New Meanings

A.2 Urban Form Theory

A.3   Urban Morphology and Planning Tools

A.4   Landscapes in Transformation

A.5   Re-Emerging Substrata

A.6   Ancient and New Public Spaces

PH.1   Urban Morphology in Historical Context

B.1   Reading/Design Study Cases

INTRODUCTION TO THE CONFERENCE

Giuseppe Strappa

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President of the Isufitaly Scientific Society
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Thanks to the Sapienza University Vice Rector for his inspiring presentation of our Conference and thank to the Director of the Center for American Studies for hosting Isufitaly 2020 Conference in this magnificent venue.

Palazzo Mattei di Giove is an ideal place for our meeting devoted, as it has become tradition for our debates, to the transformation of the existing city.

This site is a perfect interpretation of the title of our Conference, a true explanation of the notions Substrata and Regeneration.

All this huge block, the so called Insula Mattei, was built on the site of the former *Teatrum Balbi*, not demolishing it, but transforming the ancient remains. It is a real text of Urban Morphology.

Today it is impossible to recognize the shape of the theatre, but if we take a look to the ground floor map of the block, we can realize that the theatre reappear buried in the basement structure as an underlying layer. It give form to the geometry of the new fabrics, even giving them their architectural character. Not by chance all this block, based on the consumption of an organic structure, is composed by special building, mostly palazzos, while the one just in front of it, based on the consumption of the serial structure of the *Crypta*, gave rise to base building composed mostly by merchant row houses. All the ancient structures are also a morphological lesson about the notion of a regeneration process. The whole area is an almost didactic evidence of the transformation phases of nature into architecture, where nature is however, we could say, artificial, made up of ancient remains.

Using Muratorian categories, the passage from matter to material is testified, a few meters from here, by the presence of a *calcara*, a furnace intended to produce lime using the remains of ancient columns, floors, architraves. The reuse of entire structures or of whole organism, such as the Marcellus theatre transformed by Peruzzi in Palazzo Orsini, is also evident.

It is obvious that the ruins have always had a great fascination for architects. Also a risky fascination, in my opinion, as ruins (from the latin *ruere*) means something fallen down, dead.

I believe that it is much more useful for us, as Urban Morphology scholars and architects, the notion of substratum (from the Latin *sub sternere*,), the still vital layer on which new organisms originate.

Substratum is the part lying below the present built landscape that no longer has any practical purpose but can still contribute to the life of the new fabric, creating up to date building types. It is the distant and fertile foundation that gives rise to modern organisms.

The question was raised by Saverio Muratori who enumerated the criteria to be used when examining the cultural characters that make up the built environment (rational-cultural, economic-technical, ethical-political, aesthetic-historic), identifying four different ages of change in the Rome urban organism, of which no less than two (Royal – Republican and Imperial) concern the development of the ancient city. Muratori was particularly referring to Rome, though it is well known that he believed that the method he proposed was generally valid (and studies concerning existing city substrata outside Europe, for that matter, have shown how an analysis of the historic layers proves to be an important resource even in areas culturally very different).

In the same years Gianfranco Caniggia used his influential study on the city of Como to build up a method of interpreting the change from a *domus* substrata to a modern

residential organism using type-based phases: 'tabernisation', infilling, development from single-family to multiple-family house. In the same years that

But the notion of substratum also includes a second, immaterial aspect: the legacy of ideas, design, research which constitute the deep layer to contemporary action. For this reason we decided to organize our meeting with an opening plenary session devoted to the first aspect: to the concrete, solid, historical and archaeological substrata.

It will be dedicated to the relation between the work of the architect and the one of the archaeologists. A problematic relationship, which in my opinion has recently produced some good results, but also several disasters.

From the architect's point of view, I must admit that often the archaeological area (and more generally the historical intervention site) is considered the backdrop for refined objects that testify the creativity of the author. The culture of the architect-archaeologist, which for a long time has oriented the interventions congruently with the needs of the excavations and of the urban spaces, has been unfortunately lost.

For a true interdisciplinary collaboration there are considerable problems, however, also for archaeologists, who often seems to tend, today, to consider the archaeological excavation site as a laboratory. On the contrary excavation is architecture, transform the urban space. I would say clearly that the results of the recent excavations of the Imperial Forums, for example, as they are displayed today, are an extraneous and incomprehensible part of the city.

The closing plenary sessions will be devoted to the second aspect: to the immaterial substrata, namely our tradition of studies and designs. The sessions will be dedicated to the "memory of the masters", on the occasion of the missing of two eminent urban morphology scholars

Tradition is also a project. it is not inherited passively; it is rather a choice. Also, master is not just the author of seminal studies: he is as well a figure in which a scientific community recognize common ideals and aspirations.

And in this sense, remembering together Gian Luigi Maffei and Antonio Monestiroli has a profound meaning for those who know the stories of long divisions of the Italian morphological schools.

Thank you for your attention and have a successful conference.

SUBSTRATE AND REGENERATION

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Substrate and regeneration, two terms that express the beginning and end of the history of the city, appeared to us significantly useful to perimeter the scope of discussion in this conference, within the Italian section of the ISUF International in 2020.

Not new terms, but current and particularly felt by urban morphology researchers; always at the center of the debate and field of confrontation between historians, archaeologists and architects. Words that we wanted to emphasize, in the opening conference, inviting to discuss some exponents of historical culture and the design discipline. "Architectural Substrata and Archeological Design" was therefore the title of the opening conference, which was attended by Paolo Carafa and Alexander Schwarz.

Paolo Carafa in his opening plenary session speech "Archeology of Architecture and Landscape: History and Storitelling" urged us to reflect first of all on the value of the substrate in the flow of the city's history:

"To study either an ancient city, or medieval, modern, or contemporary ones as well, means defining the flow of its changing landscapes. This means, to tell its story through the reconstruction of its urban "structure" and topographical lay-out in different phases." (Carafa, 2020);

This is true for the entire history of the city as for every single element for that it means and for how much it is significant for the unitary and current understanding of the city. Paolo Carafa (editor with Carandini of the "Atlas of Ancient Rome"), one of the main exponents of Roman archaeological culture, addressing a plethora of architects and urban morphologies, in his lecture, explained exhaustively how every single archeological fragment is more important if reinserted within of its original context, inside of the urban organism framework and in the own flowing of time.

Beyond any doubt historical and documentary value, the archaeological fragment can prove particularly useful for re-imagining the overall scenario - which unfortunately many times lack the important and indispensable pieces to recompose the unitary framework of the architectural and urban image that made up every single phase relatively finished.

A part of the whole that can reveal it to us the profound meaning that it had at the origin of the transformations of the city, understandable only if you can restore the entirety of the finished image which from time to time constituted a phase of the inner transformation, from the moment in which the first rules have been defined up to the present, when the complexity and rapidity of the changments can make us appear the urban metamorphoses rather simple expressions of chance.

"As the ancient landscape was an integrated physical reality composed by complete elements, that is "buildings" in the broadest sense, the log-ical core of the system is a construction or a clue of it. It doesn't matter how large or small, complex or simple, rich or poor it was. Any real ob-jects can be classified as constitutive elements of the landscape." (Carafa, 2020)

It seemed that urban morphology can express all its operational potential right here, proving to be a useful tool to understand how much of the past is lost or reused and how much can still return to being contemporary. Starting from the breakthrough street footprints, and from the topological variants that represent the most recent and still perfectly recognizable elements we can, in fact, by regressive analysis, leafing through the different layers of history and urban form, Highlight what has remained or regenerated in the present and what is instead possibly attributable to a more or less remote past. Recovering the common thread that from time to time has guided the transformation of

the building fabric, but which can still be regenerated in building type, architecture and the city.

Alexander Schwarz urged discussion on the theme of the project by addressing the difficult relationship between inheritance and future. A relationship that has architecturally placed the center in the reinvention project of the center for Berlin. Just starting from the idea that the city is, as already claimed by C.O. Sauer in 1923, a complex and articulated body. A project, the one for Berlin, which has shown us how important are the forms and centralities of the past in order to reinvent the city of the present. Schwarz's Lecture "Museuminselsel, Berlin. The invention of an ideal Historic city center" has been particularly effective in showing how the urban history, even that of a modern and global city like Berlin, can become active in the architectural project and helpful to define or regenerate e new or renewed urban centralities but also to help us elaborate complex architectures that go well beyond the simple definitions of a palace or special building.

HIDDEN *OὐΣIA* AND URBAN RIGENERATION
Brief summary of the 5th ISUFItaly International Conference

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It is difficult to propose a complete balance of the proposed themes because the set of contributions, hosted in the proceedings, ranges over very different issues, concentrated - in most cases - on contemporary, often problematic, views in which it is possible to recognize the essence of what is meant by sostrato.

Giuseppe Strappa has already outlined the meaning of this term, combining it in different possible meanings especially in the field of urban morphology.

His article substrata. morphology of the ancient city, beyond its ruins published in n. 9-10 of Urbanform and Design explores the topic with scientific depth, without neglecting any meaning.

The proposed reflections can be considered possible themes to be developed, having already dealt with Strappa's definitions, principles, process.

If one goes beyond the concept of the only materiality referred to the sostrato, the potential interest to explain this phenomenon immediately emerges as something that is immanent in what is considered as "being below". Which means grasping a "sign" in the existing structure, a trace, which can be conceptual and / or conscious, which is the permanence of an antecedent that shows itself in the present and produces concrete effects on reality.

But since sostrato is *OὐΣIA*, that is, substance, we must contemplate what is hidden within the sensitive thing as its ontological foundation.

For this reason, our task is to reveal it as pure truth, that is, as *alètheia* that offers itself (says Heidegger) precisely for its "non-hiding" if we are able to perceive it in its real material or incorporeal scope, considering it a potential resource precisely for a new forecast starting from the ancient.

Recognizing this assumption, which leads to affirming the existence of a flow that precedes the inversion of something that still exists only in potential, means asking oneself what effects it produces on a conceptual level even before 'becoming other' and, at the same time, how it can be an announcement of an *eidos* that comes to inform the real, that is to give shape to the project.

This operation should not be considered solely as an interpretation of an existing that is given to the operator interested in grasping the outcome of the construction... it is because, retracing the traces of its being the transmission of a past that emerges in tangible form, it is simultaneously the basis for a hypothesis of project, of idea launched into the future.

In parallel with the research on the urban substratum, the theme of regeneration has been proposed a theme which is very TOPICAL today!

Many contributions have crossed this topic and a wealth of opinions and solutions have emerged ....

Such opinions and solutions have welcomed the sessions we launched with the call with great sensitivity and interest.

Interpreting regeneration in the heredity dialectic project means understanding that our work must always deal with a legacy that is not only pure physicality but is testimony to the work of a culture whose essential traits must be re-read so that a re-generation can be proposed that starts from what has been generated. Imagining a morphology that is not built from scratch, from a blank slate that is not a specific attribute of the world of architecture but is a privilege of the visual arts.

The papers proposed in recent days have opened numerous focuses and I am sure

that the publication of the documents will be able to give well-founded answers - given the multiplicity of cases offered for common reflection - and open up further fields of critical reasoning.

Although the creative period of modernity has been recorded today, a frightening condition of disorientation and stagnation in which the productivity of thought seems to be found.

Many ideas were inevitably provided in the plenary sessions starting with the initial one coordinated by Paolo Carlotti with speakers Alessandra Capuano, Paolo Carafa and Alexander Schwarz. Rich dialectical comparison on the theme of Architectural Substrata and Archeological Design.

Always with the same scholars we attended the round table, coordinated by Carlos Dias Coelho on the theme Archaeological Reading / Architectural Design.

The presentation of the Urbanform and Design urban morphology magazine and the books was proposed by Vitor Oliveira, Fabio Di Carlo and Federica Visconti.

Finally, the memory of the Masters Gianluigi Maffei and Antonio Monestiroli proposed, respectively, by Marco Maretto, Giancarlo Cataldi, Paolo Vaccaro, Ivor Samuels and me and by Renato Capozzi, Tomaso Monestiroli, Raffaella Neri and Federica Visconti.

Urban Fabric and contemporary dwelling in the Greek-Roman centre of Naples

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Keywords: *historical fabric, dwelling block, Naples*

Abstract

The paper concerns a research-didactic activity having as object the Greek-Roman historical centre of Naples. The general Urban Plan of the city allows the demolition and the reconstruction of the main part of an insula *where there is now a high building of speculation except the monument – Pio Monte della Misericordia – that occupy the head of the block along the* decumano*.*

If the insula is the project-area, the study area is extended to the whole ancient centre where the relationship between building typology and urban morphology exhibit the idea of a compact city that became too dense over the time but still 'porous' because of the voids of the courtyards, above all of the huge monumental complexes and of the monasteries.

The theme of the projects is the reconstruction of the dwelling block with many further degrees of complexity related to the context of a stratified and rich of history fabric that represents, in Naples, the Word Heritage 'monument' more than the single buildings that constitute it.

Through the projects, it was possible to verify the possibility to introduce, in one of the more asphyxiated part of the ancient centre of Naples, a different idea of inhabiting, based on the introduction of 'degrees of exterior spatiality', trying to make space between the things but also to make cleared the support surface of the building in order to realize soil permeability and green areas: an idea of city able to recognize the values but also to formulate a critical judgement on the current situation and thus an architecture that wants to express the continuity of the history but without renouncing to expresses itself in the contemporaneity.

Premise – *Building in the built*

Building in the built is an expression that has become today a kind of slogan that, in a really generic way, is referred to a condition of our totally anthropized territories and cities to which recovering the existing heritage – extensively understood – is asked for, limiting the consumption of soil: in this way the expression tends to include any act of the architectural work. On the contrary, the expression is much more full of meaning and appears, probably for the first time, as title of a book's chapter by Renato De Fusco in 1994 (De Fusco, 1994) to define the characteristics of the operation carried out by the Extraordinary Residential Building Program (Programma Straordinario di Edilizia Residenziale_Pser) developed after the Irpinia's earthquake of 1980, a plan implemented through many redevelopment interventions realized through punctual insertions – sometimes of completion sometimes of reconstruction – in the historical centres of the metropolitan area of Naples. In fact, already a few years earlier, De Fusco used the expression *building in the built* in a collection of short essays (De Fusco, 1992), making it a possible category for intervention in the historical centres, referring explicitly to the definition of *architecture as modification* by Vittorio Gregotti (Gregotti, 1984). The relevant interest in De Fusco's reflections is in the fact that the Neapolitan historian underlines – regarding the intervention in the historical centres that he feels as increasingly unavoidable for their redevelopment – both the 'deficiency' of culture of conservation and the inadequacy of a 'case by case' logic, often understood as the only possible answer to the question of architecture that historical urban fabrics put in order to continue 'to be inhabited'. These reflections must be shared. In fact, on one hand, there is no doubt that the 'architectural' attention to contexts made sensitive by the presence of relevant values – historical but even more formal – is a specificity of the Italian architectural culture, consolidated during the second half of the twentieth century especially in the disciplinary area of architectural and urban composition (Rossi, 1966; Aymonino et al., 1970). However, on the other hand, it must be recognized that the elaboration of an original theoretical thought has not been accompanied by an equally significant and extensive experimentation linked to architecture and its making, precisely because of the affirmation of a culture of conservation that, in a conspicuous paradox, seems to renounce that *our age can express its own greatness*, renouncing, in this way, to recognise that the wealth of values that our cities and our territories express derives properly from their uninterrupted stratification. Perhaps it is exactly this 'conflict' between culture of conservation and project of *the architecture of the city* (Rossi, 1966) that has often determined the appearance of the 'case by case' logic that, associated with a pervasive idea that the architecture is on the market as any other product, has allowed the advent of *enlarged design objects* in the historical centres of our cities (Gregotti, 2008).

Instead, working on urban heritage is an operation that requires going back to reasoning about the relationship between knowledge and design, as two moments of the architectural action that can not be intended as different from each other. Architectural design is the instrument, in our discipline, of knowledge of the world, the tool through which a critical judgment on the reality can be expressed, in view of its modification. For this reason, the design in the built environment of the city has to do with *time* and *space*. Marguerite Yourcenar, in T*he Mighty Sculptor, Time*, wrote some beautiful pages in which, with reference to the ancient statuary, talked about the 'work' that time has done on the works of art that we admire today in a form that is never the original, different after the sculptor has finished his work and the work of time overlapped – Yourcenar states – making those works *sublime*. But it is not the category of *sublime*, the uncanny, the category that belongs to architecture, it is rather the *beauty*, as Cacciari would remind us, in the Greek sense of the term – *kalón* – that has in itself the sense of a good construction, of 'staying erect', of being destined for a long duration (Cacciari, 2006). Our cities appear beautiful because, during history, the architectural, 'contemporary' project has always been practiced, with urban sensitiveness, to realize a single collective construction: *the city as architecture*, as Leon Battista Alberti stated, and as Aldo Rossi wrote in *The Architecture of the City*. Only if architecture is able to produce this collective work, the danger that Ortega y Gasset in the 1951 Darmstadt conference reminds us – with words

that seems to describe the current condition – can be avoid: « a city built by brilliant architects who, however, foresee each one on their own with a different personal style [where] the buildings can also be magnificent individually, but the whole will be bizarre and intolerable [because in their] lines we would seem to see the impertinent profile of a gentleman who "felt like" doing it like this» (Ortega y Gasset, 1962).

Therefore, the *time* of the architecture of the city is not a time that we can let pass without making choices or that can be frozen at a certain moment but it is a synchronic time that reifies and materializes itself in the *space* of the city as the place of a physical accumulation, in the present, of the long time of the history. However, if the time of architecture and the city is a synchronic and continuous time, perhaps its space could today not necessarily be so. In a city that has sometimes become suffocating and has partially lost its form, producing inadequate living conditions for its inhabitants, it would be necessary, through the project of the new, to reflect on the possibility of introducing ways and forms capable of reinterpreting the reassuring continuity of the historical city, on one hand, but also to work, on the other hand, on unprecedented possible relationships 'between the things' capable of associating places of an interior spatiality that we well know, and places characterized by an exterior spatiality, capable of dialoguing with the open dimension of the nature (Schröder, 2015).

Methodology of the urban analysis

These reflections were the basis of the work carried out in the context of a Laboratory of architectural design in the second year of the Degree Course in Sciences of Architecture at DiARC_Department of Architecture of the University of Naples "Federico II" that addressed the theme of a collective residential building within the urban fabric of the ancient centre of Naples.

The project-area is that called 'of San Carminiello ai Mannesi', where the insula which hosts the archaeological remains of the Roman age, discovered after the collapses caused by the bombings of the Second World War, and the adjacent *insula*, on which a very modest building of speculation is placed, are indicated by the Urban Plan of the Municipality of Naples as a possible area of redevelopment through the demolition of the residential building and the revamping of the archaeological excavations.

The study-area extends to the entire Greco-Roman centre of Naples where the relationship between building typology and urban morphology describes a clear idea of a compact city, that has become too dense over the centuries, even if it remains 'porous' because including the voids of the courtyards and especially of the huge convents and monumental complexes. This feature of the city emerges looking at some drawings that represent codified tools of the urban analysis. *Straßenbau* – road system map – and *Schwarzplan* – figure-background plan – describe the relationship between the urban morphology and the buildings that are always aligned along the streets and define the form of the rectangular blocks, approximately 36 by 180 metres. In such a compact city the two drawings – *Straßenbau* and *Schwarzplan* (Fig.1)– are one the negative of the other due to the rules of the soil occupation without gaps. There is not void in the dense urban fabric that it is possible to call piazza, but only *widenings* or *incisions* that are small façade's retreats or of the block's head (Savarese, 1991). Nevertheless, there is another important feature of the urban fabric of the ancient centre of Naples that emerges clearly looking at the *Topographic Map by Giovanni Carafa Duca di Noja* of 1775 where entrances, atria, courtyards with their porticos – both of main civic and religious buildings, together with churches – are represented in their typological plan. This is the 'porosity' described by Walter Benjamin when, in a comparison with the quality of tuff stone, wrote «As porous as this stone is architecture. Building and action interpenetrate in the courtyards, arcades and stairways. In everything they preserve the scope to become a theater of the new, unforeseen constellations […] Buildings are used as a popular stage. They are all divided into innumerable, simultaneously animated theaters. Balcony, courtyard, window, gateway, staircase, roof are at the same time stage and boxes.» (Benjamin and Lacis, 1925). But it is not only a human atmosphere, that described by Benjamin, it is a quality of the spatiality of the Neapolitan urban fabric that emerges in the reading of the

features of the spaces – through the *Rot-blau plan* – related to their quality of interior or exterior spatiality (Schröder, 2015) and their morphological or architectural boundaries: the narrow streets of the ancient centre are uncovered but they are outer spaces delimited by urban forms and also the courtyards, with their architectural boundaries and their *inclusive dedication* are a sort of enlargement of the public space of the city inside the blocks (Fig.2). The analysis, in this way, added further degrees of complexity to the theme of the collective residence that derived from the task of 'building' an intervention within a layered urban fabric, full of history, that constitutes in Naples, perhaps more than the individual buildings or, however, in a different way, the real 'monument' heritage of humanity (Fig.3).

Ideas of contemporary city for the ancient city of Naples
The different concepts elaborated for the projects allude to precise typological structures, always in relationship with the orientation of the buildings and the heliother-
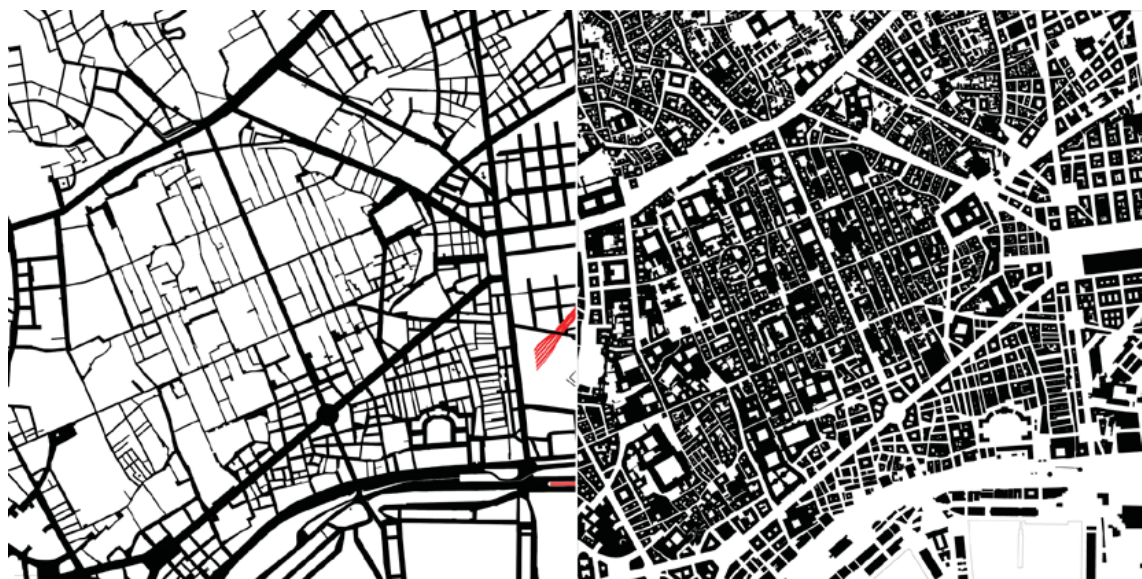
Figure 1. The Greek-Roman centre of Naples. *Straßenbau* and *Schwarzplan*

Figure 2. The 'porosity' of the urban fabric. *Rot-blau plan*: general and detail

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mic axis. Moreover, the schemes share the aim 'of making space between the things' in order to realize better living conditions for the inhabitants of this urban part, where so strong is the relationship between the building typologies and the whole *forma urbis*, working on both the continuity and the progressive feature of our work. Certainly, talking of continuity, all the hypotheses are based on the analysis that revealed the rules of the process of formation of this part and its structure even if, beyond this unavoidable reading and in the belief that today not only a continuation of the process of urban fabric formation is necessary but also the introduction of a discontinuity, other solutions have been explored.

A first hypothesis is that using the courtyard as typological choice: isolating it from the two heads of the block or duplicating and opening it, mirroring two different building on the axis of a central open space. A second hypothesis entrusts to high buildings the role of recomposing the façade along the *decumano*, concealing a portion of fabric of patio houses. In the third hypothesis a long building define the alignment along *vico dei Carbonari* while several orthogonal buildings define a curtain along *vico dei Zuroli* characterized by a rhythmically alternation of full heads and open spaces. Finally, in the last hypothesis buildings following the two different orientations of *decumani* and *cardines*

Figure 3. Monuments of the Greek-Roman centre of Naples. Typological map

are composed *à redan*.

In all the different hypotheses, some methodological qualities are shared, representing the fundamentals of a theoretical approach to this kind of revamping intervention in the historical city (Fig.4). First of all, the typological structures were defined looking for the most adequate for distributing the flats, preferring traditional multi-storey buildings if with east-west oriented fronts and, if with north-south oriented fronts, common walkway access buildings or placing vertical connections and services on the long side in order to reduce the surface of the worst oriented façade. Almost all the projects are composed of different building typologies that pursue the creation of a typological mix: an architectural concept to which the idea that this small portion of the ancient centre could be able to accommodate different categories of inhabitants corresponds. Finally, all the projects had to face the subject of the relationship with the form of the ground, which here has a not inconsiderable inclination and, thus, it became an opportunity to define the design of the public space between the buildings, with different degrees of naturality, or to create unexpected crossings of the block giving to the projects a significant articulation also in their transversal section.

Thus, designing in the historical centre, the relationship between project and history is a central theme, regarding the idea of city the project wants to develop and the typological form it chooses: moreover, it is a subject that concerns the architectural language. But if one feels distant from conformist positions that look to the past as a refuge, the same happens for an avant-garde attitude that interprets progress as a refuse of history. The projects for San Carminiello ai Mannesi represent a reflection on the character that the buildings had to assume, simply by working on the two main systems – the masonry and the tectonic one – sometimes used simultaneously to define pieces and parts of the buildings – first of all the base, body and crowning – and, in some cases, to denounce their spatial and typological structures, following the lesson of all the history of architecture and assuming references from it. This is the right way to find adequate forms: those where the architectural character corresponds to the theme and to the methods of composition, forms that it is possible to call *responsive* (Monestiroli, 2002; 2010), avoiding the idea that the architectural character can be reduced to the drawing of a skin for the building and, on the contrary, working, inside a field of 'normal architecture', looking for new forms of adequacy able to express an ethical responsibility towards our cities.

Overall, the design experimentation wanted to reflect on the possibility of working on, within one of the most asphyxiated and compressed parts of the ancient centre of Naples, a different idea of inhabiting, based on the introduction of some discontinuities and openings, trying to make space 'between the things' and, in this way, introducing pieces of exterior spatiality in the interior spatiality of the urban fabric, also leaving large parts of the support surface in a condition of permeable soil. This is an idea of a city that, with significant attention to the existing and recognizable urban values, without contradicting them but by applying a critical judgment on reality, aims to achieve better living conditions, through an architecture that can express itself in the continuity of history but without renouncing to be authentically contemporary, meaning the project as a tool capable of revealing the existing order systems – the values of the architectural and urban 'fact' – and, at the same time, of building new orders which can – indeed must – include the values of our present. Against the idea – unfortunately today largely spread – that it should be better only preserve and not build in the historical area of our city, there is another way, looking at Architecture as an 'optimistic' discipline, which, like politics, deals – or should deal – with reality, with the aim of giving a better reality to future generations. Today, politics has renounced this task, becoming an exercise of individual power rather than an expression of thought among ίσοι within a community. Even part of architectural culture, individualistic and self-referencing, did the same thing. In the present time, our ancient discipline has an even more important task: not to photograph reality, but to try to imagine a better reality where the man can still recognize himself in the architecture.
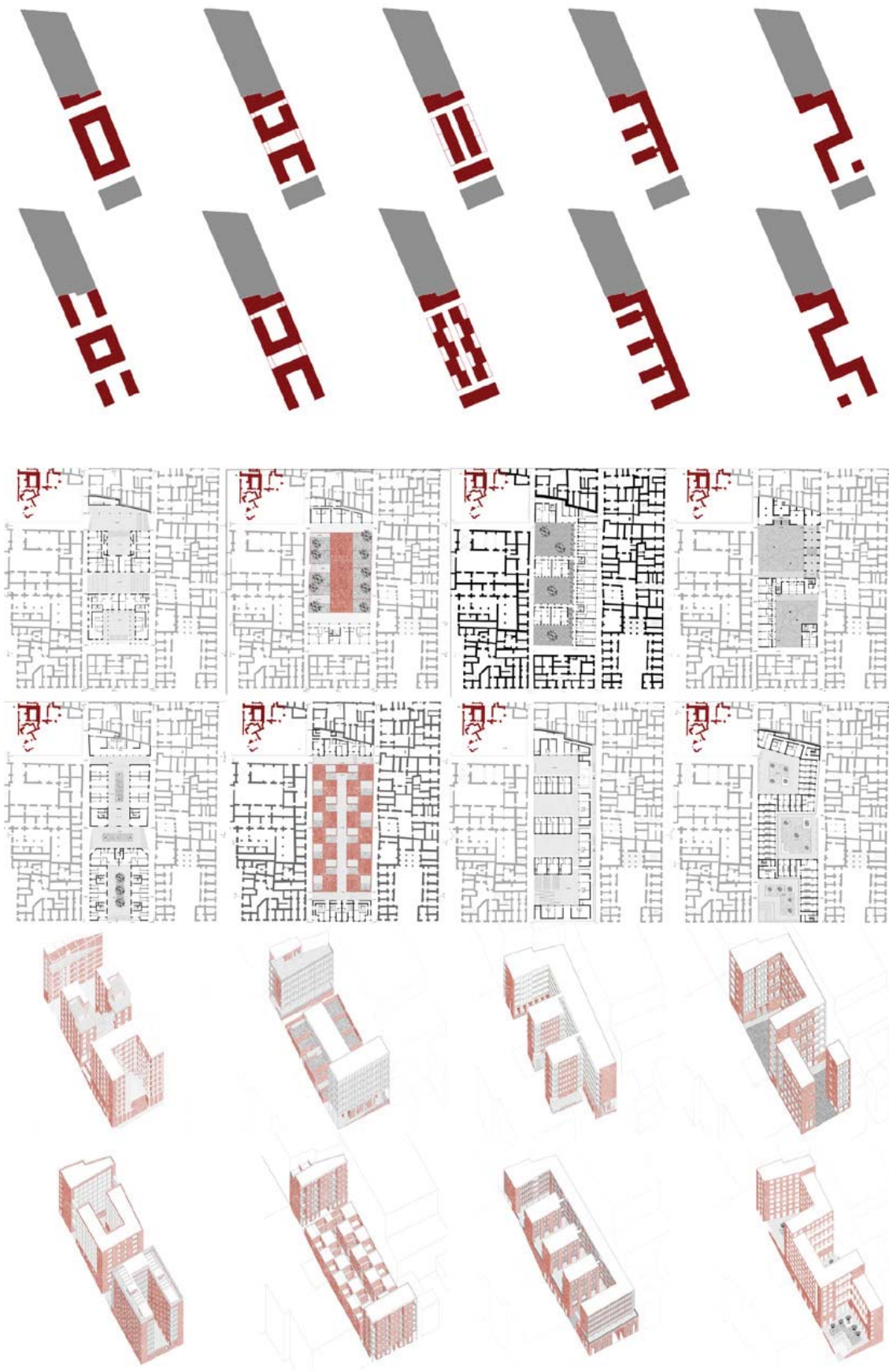
Figure 4. Morphological schemes and Projects for San Carminiello ai Mannesi *insula*

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Micro-urbanism – additional tool for urban heritage determination

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Keywords: *micro-urbanism, urban morphology, urban heritage*

Abstract

The urban morphological analysis of historical urban fabric and the built environment is in the focus of the current study as the main tool for urban heritage determination. The paper is going to discuss the results of the micro-urbanism analysis within the framework of heritage evaluation.

The morphological regions and their more complex notion, the urban tissue types were designated as a base of urban heritage determination. Thus the raison d´etre of urban morphological studies focused on morphological regions as the ensembles of the built environment, are indisputable.

The studied towns (mainly the historic core from the period of Austria-Hungary) belong to not only one, but to six countries nowadays (Hungary, Serbia, Slovakia, Romania, Ukraine, Croatia). Thus it is recommended to create amendments of the principles, that were established by a common UNESCO-ICOMOS platform. The lessons learned by detailed theoretical analyses of the UNESCO-ICOMOS doctrines and charters point out, that the urban morphological research and its different strata (urban forms, structural components, built environment, urban tissue and their interaction) act as background and fundaments to constitute urban heritage proposals. Proposals for structural development and transformation of the built environment in the urban heritage environment (not exclusively protected by law, but considered as heritage) primarily reflects on the sustained cumulative lessons. The complex structural layers of specific urban tissue types have to be understood, due to keeping and maintain the character of the urban fabric and built environment, thus the identity of the town as a whole.

Introduction

"Towns have a life history. Their development together with the cultural history of the region in which they lie is written deeply into the outline and fabric of their built-up areas" (Conzen, 1960/1969, p. 6). M.R.G. Conzen's thoughts remain valid, although as a result of globalization, architectural uniformity and omnipresence of analogous forms, towns are facing a kind of partial identity loss (Gospodini, 2004); development of a harmonic urban concept in mind with built heritage and contemporary needs, identification and mapping the values, that have been preserved in the urban regeneration processes are not only questions of identity-preservation but in their complexity, these are also issues of contemporary planning which have to be solved, however, the problem[1] belongs not only to contemporary society but arises again and again. The problem and an attempt to solve it created the Italian school of urban morphology, and according to a contemporary interpretation (Whitehand – Gu, 2010), the basis of the urban heritage protection and evaluation is the determination of boundaries and properties of the morphological regions (phenomenon defined by M.R.G. Conzen). This interpretation addresses the importance of the practice of the Italian urban morphology school, which takes into account historical changes as significant factors that form the built environment. Complex evaluation and protection of urban heritage date back only to 2006, when the UNESCO introduced the World Heritage Cities Programme, and from this perspective, it cannot be denied that the raison d'etre of those urban morphological studies are focused on morphological regions as the ensembles of the built environment.

The studied towns (mainly the historic core from the period of Austria-Hungary) belong to not only one, but to six countries nowadays (Hungary, Serbia, Slovakia, Romania, Ukraine, Croatia). In case if we consider examining the fact how the lessons and guidelines were outlined by the fundaments of the urban tissue typology and micro-urbanism, fit into the legislation of these countries, we are going to lose the essence of the work so far: it would become case and country-oriented rather than to be realized the unified management of the joint town-creating past' manifestations. Thus it is recommended to create amendments of the principles, that were established by a common platform. The lessons learned by detailed theoretical analyses of the UNESCO-ICOMOS doctrines and charters point out, that the urban morphological research and its different layers (urban forms, structural components, built environment, urban tissue and their interaction) act as background and fundaments to constitute urban heritage proposals.

Urban tissue typology, micro-urbanism and the related UNESCO-ICOMOS doctrines

The general lessons that can be formulated regarding the results of the urban tissue typology and micro-urbanism analyses in the former Habsburg (Austro-Hungarian) towns also can be found in the studied UNESCO-ICOMOS doctrines.

Five statements are selected, according to the general conclusions we can point out based on the results of the analyses (urban tissue types, micro-urbanism), which can be also outlined by the relevant UNESCO-ICOMOS documents:

1. "Qualities to be preserved include the historic character of the town or urban area and all those material and spiritual elements that express this character, especially: Urban patterns as defined by lots and streets; Relationships between buildings and green and open spaces; The formal appearance, interior and exterior, of buildings as defined by scale, size, style, construction, materials, colour and decoration; The relationship between the town or urban area and its surrounding setting, both natural and man-made; and the various functions that the town or urban area has acquired over time." *(Charter for the Conservation of Historic Towns and Urban Areas - Washington Charter)*

2. "Modern towns and urban areas are complex phenomena that have resulted from the historical stratification of cultural values imprinted in their wider natural environment. Nowadays, the urban phenomenon, much more so in the historic urban areas, cannot be diagnosed without reference to all physical and cultural, tangible and intangible parameters, through which their particular identify is shaped: the built-up environment, as shaped through time by man, along with its particular morphological features, the variety of volumes and intermediate free spaces;" *(The Valletta Principles for the Safeguar-*

ding and Management of Historic Cities, Towns and Urban Areas)

3. "Such contemporary architecture, making deliberate use of present-day techniques and materials, will fit itself into an ancient setting without affecting the structural and aesthetic qualities of the latter only in so far as due allowance is made for the appropriate use of mass, scale, rhythm and appearance." *(Resolutions of the Symposium on the introduction of contemporary architecture into ancient groups of buildings, at the 3rd ICOMOS General Assembly)*

4. "An understanding of the history and significance of a site over time are crucial elements in the identification of its authenticity. The material fabric of a cultural site can be a principal component of its authenticity." *(The Declaration of San Antonio)*

5. "Understanding, documenting and interpreting the setting is essential to defining and appreciating the heritage significance of any structure, site or area." *(Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas)*

Addition: The architectural heritage includes not only individual. buildings of exceptional quality and their surroundings, but also all areas of towns or villages of historic or cultural interest. *(The Declaration of Amsterdam)*

The lessons learned by detailed theoretical analyses of the UNESCO-ICOMOS doctrines and charters and the practical examination of the results of the urban tissue typology and micro-urbanism analyses results point out, that the urban morphological research and its different layers (urban forms, structural components, built environment, urban tissue and their interaction) act as background and fundaments to constitute general urban heritage conservation and protection proposals.

The related urban tissue typology and micro-urbanism

The urban morphological features (urban tissue types and spatial relations) were determined by the development of the spatial changes and the interaction between the components of the urban fabric for the better understanding of the historical movements and driving forces, which led to the unique urban and architectural 'manifesto'.

The micro-urbanism studies as supplementary analyses of the urban morphology of the studied towns deal not only with the urban structure but also with the architectural context of the urban tissue: how the building itself and the built environment, in general, is related to the structure and vice versa, thus how the townscape changes and interacts. The mutual effect is a phenomenon of micro-urbanism. As it is based on the taxonomy of the urban tissue type, urban regulation principles and the built environment, it suggests urban rehabilitation principles and the contemporary architecture.

Urban structure and architecture, be it a unique manifestation or a coherent ensemble, can only be examined in the interaction of each other if the goal is to create a complex image – on the level of micro-urbanism. It is of an interdisciplinary nature and deals not only with the structure but also with the architectural context of the selected towns through macro and micro scales; how the building relates to the structure and vice versa. Macro scale represents the urban structure with the urban tissue types together with the additional green spaces, the micro scale is the vertical articulation of the building fabric and their specific elements, thus the analytical system still follows the cognitive approach of M. R. G. Conzen, with a combination of Caniggia's research methodology (architectural typology).

The townscape changes can

be followed as specific imprints of a certain time period. In the case of these towns, similar townscape characters have evolved between 1867–1918, as specific combination of structure and built environment, and urban ensembles (micro-urbanism).

The quantitative studies are complemented with the qualitative studies; the study of the elements, structure systems and connection with the spatial layout. These include: corners and intersections as building elements and spatial features – morphology and types, connection; street junctions with extending morphological elements. The analysis uses practical examples

of typology and takes into account the architectural, urban design and systematization determinants of the era (Josef Stübben, Camillo Sitte, Palóczi Antal, etc.) in the

region; the morphology of infill – how the infill was resolved in a certain period of its creation, how it reacts with a particular urban fabric and architectural environment; a combination of architectural elements – together with the quantitative analyses.

The urban tissue typology had to deal with the green spaces in order to create a more accurate taxonomy, but the micro-urbanism takes the various types of greenery into account as part of a townscape – an element which changes the perception of the space together with landmarks (secular, sacral).

Micro-urbanism as additional tool for urban heritage determination

The basis of the urban heritage protection and evaluation, according to a contemporary morphological interpretation by Whitehand – Gu (2010), is the determination of boundaries and properties of the morphological regions. Micro-urbanism is a complex area in the field of architecture and urbanism. It acts as a new discipline and approach in urban morphology.

Appreciation of morphology, analysing the evolution and change in traditional urban space and the typology that defines zones and urban pattern are the key elements in considering local patterns in the nominative processes of urban development. The mutual effect of urban structure and the architectural context is the phenomenon of micro-urbanism.

Micro-urbanism studies are based on the urban tissue type taxonomy, the urban regulation principles, the built environment, towards urban rehabilitation principles and contemporary architecture of nowadays. The fundamental aspects, based on the spatial relations between physical objects include the natural environment and the built environment, and the built environment is essentially embedded within the natural environment. Therefore, the chosen case study areas should combine historical and contemporary factors determining the towns' unique character: abandoned and well preserved urban heritage, various urban tissue character, possible urban rehabilitation area, former greenfield development, the changing urban and natural landscape.

The micro-urbanism analyses read the town according to the combinations of the elements of the structure, urban tissues and building fabric, which creates a collage via a unique combination of the repeating elements.

The collage nature of each town allowed us to examine the forms of urban areas and the whole structure has been read as an entirety. The similar spatial arrangement of the forms and similarities in the built environment serve as a set of evidence to evaluate the towns in pursuance of similar criteria based on micro-urbanism.

Caniggia and Maffei conclude, the typological process [as the micro-urbanism also belongs to the typo-morphology] has to be interpreted as "succession of changes in time, distinctions and applicable mutual spatial influences (…)" (Caniggia – Maffei, 2001, p. 56). The comparison takes the main urban identity-shaping urban forms and relationships into account, which created the specific character of the town and its identity in the research period. The theoretical aspects of the typo-morphology (in our case) are the town's spatial/geographic characteristics, as well as the historical and the architectural components. Type combines the volumetric characteristics of built structures with their related open spaces to define a built landscape type.

The practical result of the micro-urban analyses is a complementary study of urban morphology with typology, inter-relations and site-specific examples of the planning decisions. In the interest of an urban regeneration/rehabilitation or a new design project in a particular urban environment implemented appropriate quality, it has to be understood and mastered the urban heritage of the urban ensemble. The essence of rehabilitation programs is the revitalization of the cities in an architectural and social sense via preservation of the original architectural structure, maintenance of residential buildings, rehabilitation, or possible demolition and construction of new buildings. Therefore, it is necessary to understand the architectural, urban design structure of the territory, as well as its morphology, but besides these technical features, the interests and opinions of the residents living in the area can not be ignored. A rehabilitation process or construction of a new building could be a socially sustainable investment and could become an accep-

table project in a given social context if the involvement of society takes place.

The contemporary urban heritage character based on its urban tissue typology can be defined by studying the urban development of the city during the period of its evolution into contemporary urban patterns.

Any proposals for structural development and transformation of the built environment in the urban heritage environment (not exclusively protected by law, but considered as heritage) primarily reflects on the sustained cumulative lessons,[2] and have to beseem to the complex structural layers of some specific urban tissue types, due to keep and maintain the urban fabric, thus the identity of the town as a whole.

Conclusions

The study of the given towns not only explores the urban tissue types but also discovers the factors creating urban identity in a wider context. In the Habsburg period, their modern image was created, while the built heritage and the inherited town structure together represent a valuable inheritance of the contemporary towns and defines the townscape. The following micro-urbanism analyses could act as individual studies, but the combination of these could code the urban and architectural planning activities and enrich the general urban knowledge of the era (1867–1918) with supplementation of the planning principles and historical and social aspects. The research opens a new chapter in urban and architectural research: a combination of urban morphology and architectural typo-morphology research.

The urban character as a platform of revitalization projects. The phenomenon of social inclusion (inclusion of the community) in different steps of the decision-making processes has become over the recent years an essential practice to achieve the success of urban regeneration interventions. Assessment and selection of projects based on the preferences of the community subjects were tested in important historic centres (Miccoli – Finucci – Murro, 2015, pp. 143-153), economic evaluations of major infrastructure were applied through the involvement of the local community. Finally, even the enhancement of the landscape and urban agriculture interventions, when this element becomes a perceptual element, are evaluated according to an inclusive and social approach.

Acknowledgements

Footnotes

[1]In the case of the Italian towns are already at the beginning of the 20th century, especially in the fascist era, the problem occurred due to attempts of forced 'reconciliation' of modern and traditional. That was prompted the creation of the Italian morphological school and bridging the gap between architecture and urban planning. They were, with Gustavo Giovanni on the forefront, striving to the contextual thinking, the harmony between the original/traditional urban tissue and the less significant modern urban forms, instead of the systematic transformation of urban centres and integration of Le Corbusier-inspired skyscrapers into the traditional fabric (Marzot, 2002).

[2]Relevant UNESCO-ICOMOS doctrines and charters: 1. Charter for the Conservation of Historic Towns and Urban Areas (Washington Charter), 2. The Valletta Principles for the Safeguarding and Management of Historic Cities, Towns and Urban Areas, 3. Resolutions of the Symposium on the introduction of contemporary architecture into ancient groups of buildings, at the 3rd ICOMOS General Assembly, 4. The Declaration of San Antonio, 5. Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas, 6. The Declaration of Amsterdam, 7. European Charter of the Architectural Heritage.

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Documenting the disappeared Rome: the San Marco district

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Abstract

The research concerns a lost part of Rome: the San Marco district, along the slopes of the Capitol. The evolution of the inhabited area began in the Middle Ages, based on an archaeological substratum of Roman era, and continued to develop until the end of the nineteenth century, when they began demolition of the historical fabric. This breaks the urban continuity, switching from a dense housing fabric, varied in building types, to one of ceremonial and celebratory spaces. This research studies the historical formative and typological process, and the redefinition of the urban fabric using the philological restoration methodology extended both to the whole pattern and to the single building.

The reconstruction of the district before the demolitions uses 1871 as the time limit, corresponding to the update of the Urban Gregorian Land Registry.

The information base consists of documentary data, such as archival, iconographic and photographic sources, associated with the typological reading of the fabric. This provides a reconstruction of the urban consistency through the critical analysis of sources. The restitution of the urban fronts and of the building facades arises as a necessary outcome: this work of interpretation and redrawing translates into a re-design process.

The area of the work we present[1] is known as the "district of San Marco" named after the church dedicated to San Marco that represented its fulcrum and that, at least in certain phases of urban development, generated its evolution.

It was an urban zone that, re-read on the toponymy recorded on the Gregorian urban cadaster, was included between the streets: Via di Marforio, Via della Ripresa dei Barberi, Piazza Venezia, the southern stretch of Via del Gesù, Via di San Venanzio, Piazza dell'Aracoeli and, along the northern side of the Capitol, Via della Pedacchia.

Therefore, it was mainly part of the Campitelli district, including also to the north some blocks of the Pigna district and bordering on the east with the Monti district and on the west with the S.Angelo district.

As can be observed in the cadastral map, but also in the many views that represented it even quite recently, it was a thick urban fabric, dense and tightly connected with the surrounding structures; furthermore, several architectural features characterized it, contributing to connote its physiognomy.

Among others, we can cite the complex of the Aracoeli convent, the Tower of Paolo III and the annexed viaduct connecting to Palazzetto Venezia, the house of Giulio Romano on Via della Pedacchia (for a certain time entitled to the renaissance architect) and, on the same road, the palace of Pietro da Cortona, or the houses that belonged to Giacomo della Porta which bordered the eastern side of Piazza dell'Aracoeli. This is just to mention some of the architectural elements that defined the urban fabric of this part of the town that was sacrificed "in the name of a single, irrational, objective: to make this area of Rome a perspective backdrop to the mass of the monument" (Racheli, 1979).

Perhaps because of its very exceptional nature, this site has been the subject of important studies and research that have investigated both the transformation process and the urban and architectural texture of the demolished building fabric. Firstly, the archival research and analysis by A.M.Racheli then, not secondarily, that carried out by M.Brancia di Apricena aiming to recompose the district and the historical and constructive events related to the Capitoline hill, last but not least that of M.R.Coppola concentrated on the Vittoriano building and its construction process.

This work is part of a more general field of studies concerning the analysis of urban transformations to which it also refers, documenting, as well through the graphic restitution, the disappeared urban fabric. The work thus contributes to reconstructing not only the lost urban structure but also the meanings associated with it and recognizes the identity of the places compromised by these transformations.

Historical and formative notes

The urban fabric we are analysing was formerly located outside the Servian wall, the area that includes part of the region VII (between Mount Pincio and Via Lata) and IX (Campo Marzio) separated by the Via Lata (today Via del Corso) and extended to the north of the VIII region (Campidoglio, Arx, Forum and Velabro). The walls ran along the slopes of the hill which was probably equipped with artificial terraces and additional autonomous fortifications, but adjacent to the urban perimeter and maybe related to them (Cifani, 2012).

Only as a result of imperial planning, the region north of the Capitol towards the wider area of the Campo Marzio, began to be systematically urbanized, taking advantage of some of the routes which were already drawn and mainly still in use: Via Lata coming from the north then running along the eastern side of the Capitol to the Forum, the route of Via Salaria which continued along the northern slopes of the hill and then crossed the river at the Tiberina Island and the vicus Jugarius bordering the southern slopes of the hill.

The Campo Marzio was also crossed by the Vicus Pallacina, east-west oriented, that led to the sacred area of Largo Argentina and by other routes parallel to the course of the river forming with Vicus Pallacina that urban triangle that still characterizes the area.

The region was included in the pomerium only during Claudio's rule, continuing to be frequented and renewed still between the 4th and the first half of the 6th century A.D. and, unlike other areas, the urban contraction determined by the depopulation of late 5th early 6th century A.D., did not result in its complete abandonment. Instead, the

post-classical landscape of this region gradually starts to take shape when the Campo Marzio plain becomes the heart of the high-medieval Rome.

In 336 A.D. Pope Marco instituted the titulus and built the Basilica of San Marco within the pre-existing structures of the district, then followed by the construction of other churches and religious buildings.

Next to abandoned and despoiled monuments, used to extract building materials, a network of crossing routes begins to be formed. On this will arise the building fabric characterized by the presence of small buildings next to fortified structures such as the castrum aureum (Manacorda, 2001), built on the theater of Balbo sediment area or the one built by the Pierleoni family using the remains of Marcello's theatre.

There was a renewed interest in the area around the Capitoline hill when in 1144 it became the seat of the Commune and place of political and commercial activities as well as the church of Santa Maria de Capitolio (in Aracoeli).

The main streets crossing the area can be recognized following the medieval processional itineraries that, if on the one hand confirm the permanence of certain routes of foundation, on the other, testify the urban structure thickening and the creation of new streets inside the Tiber bend towards the Sant'Angelo bridge between the 8th and 12th centuries.

Here converged the Via Papalis that arrived at San Marco and the Via lata, which in turn reached the Roman Forum via a route coinciding with the previous Roman one: the Clivus Argentarius - in medieval times called Ascesa Proyhi (Passigli, 1989) - to be considered an element of continuity of the ancient road system up to the modern age. Within this network, the basilica of S.Marco certainly had a key function, being configured as a pole of aggregation and attraction determining the urban evolution of the area.

At least the layout of Via delle Botteghe Oscure– Via di S.Marco and Via Capitolina (in its original direction before the sixteenth-century restructurings) was already formed between 8th and 9th century, ensuring the connection between the inhabited areas in the bend of the river and the northern slopes of the Campidoglio.

Undoubtedly, also in this area urban renewal commenced in the 15th century after the definitive transfer to Rome of the Papal seat.

And the decision of Cardinal Pietro Barbo to build in this place the palace which, once he become pope with the name of Paolo II, became the seat of the papal residence and was completed with the construction of the viridario with hanging gardens, creating the architectural complex of Palazzo and Palazzetto Venezia connected to the church of San Marco. The interventions carried out at that time also concerned the arrangement of Via Lata, which from that moment began to be called Corso taking a central role in the urban organization of Rome, and also that of Piazza San Marco and Piazza Venezia (Simoncini, 2004).

The interventions promoted by Paolo III Farnese were significant. He activated the general requalification of the Capitoline Hill by building the overpass connecting the Palazzetto Venezia and later the papal palace, known as the Tower of Paolo III, establishing the general layout of the slopes towards Piazza del Campidoglio, towards the Fora and the district of San Marco, renovating the ancient routes such as the medieval Ascesa Prothi, which was transformed into the sixteenth-century Via di Marforio, along which passed the imperial procession of Charles V (April 5, 1536).

In 1538 the arrangement of Via Capitolina began, whose renovation work would be achieved only at the end of the century (Andreani, 2005). During this period the urban structure is enriched with new noble palaces: that of the Astalli, the Muti, the Fani, the Massimo di Rignano families overlooking Piazza dell'Aracoeli.

We can notice the gradual but significant modelling of the urban fabric by observing the Bufalini map of Rome (1551), and the subsequent drawings depicting the Renaissance city.

The minor building fabric described by Mario Cartaro in 1576 testifies the permanence of the medieval features of the original layout and shows the Capitoline hill almost configured as a citadel surrounded by renewed roads.

The view of Stefano Du Pèrac in 1577, taken from an unusual point of view, offers the

opportunity to observe the urban fabric from the Quirinal with, in the foreground, the building fronts along Via Marforio, and the overpass of Paolo III with houses under its arches.

In the view of Antonio Tempesta in 1593 we note that the overpass still seems to overhang the buildings destined to incorporate it following their growth, whilst we recognize the new palaces defining the architectural scenes of Piazza dell'Aracoeli.

At the end of the 16th century the urban fabric appears to be substantially delineated in its conclusive forms, followed only by the precise architectural interventions that we can see in the views of Greuter (1618) of Maggi (1625), of Falda (1676) up to the fundamental graphic document of the Giovan Battista Nolli map of Rome that, in 1748, represents the city at the end, we can say, of its physiological developments.

In the same period, the views of Giuseppe Vasi contribute to visually narrate the urban and architectural consistency of this urban fabric that is definitively described in the plan of the Gregorian urban cadastre and in the attached brogliardi, made between 1818 and 1824.

The urban development continued here, as widely in Rome, with those typical processes that led to an urban appearance that was incoherent with the evolution typicity assuming connotations of building infill, excessive growth in height, transforming the typical features. However, it still preserved in the structure and the texture, as well as in the minor urban fabric, the memory of the formative historical process.

The demolition

The district was gradually demolished: the construction of Via Nazionale started immediately after the proclamation of Rome as the Italian Capital, whose route, although located on mostly not yet built land, involved demolitions downstream for the enlargement of Via della Pilotta, Vicolo dei Colonnesi and Via di San Romualdo, thus beginning to erode the block of Palazzo Parracciani-Nepoti and Palazzo Del Nero-Bolognetti then Torlonia destined to be definitively razed to the ground in 1903 when it was decided to enlarge Piazza Venezia.

But the decision, however not original (see the plans of Scipione Perosini for an Imperial Palace on the Capitoline hill dedicated to Napoleon in 1810) to place the Monument to Vittorio Emanuele II on the Capitol, implied the most significant and devastating transformation among the many completed after the unity of Italy that triggered a succession of interventions leading to the definitive alteration of the whole area.

On December 30, 1884, the stripping of the Capitoline hill began: among the first buildings to be demolished, there were the houses at the foot of the hill both on Via di Marforio and on the side of Via della Pedacchia, then came the demolition of the Aracoeli monastery, the Tower of Paolo III (1885-1886) and the two blocks between the slopes of the hill and the Palazzetto Venezia.

Within 1905 and 1910 two blocks of buildings were demolished between Via di Marforio and Via di Testa Spaccata.

The demolition of the Torlonia block and the consequent reconstruction of an urban backdrop designed by Sacconi in forms borrowed from the symmetrical Palazzo Venezia, was followed by the decision to "move" the Palazzetto Venezia to replace the two blocks - between Via di Madama Lucrezia, Via del Gesù, Via di San Marco and the homonymous square - that were then demolished in 1910.

The dismantling and reconstruction of the building caused the definitive demolition of the overpass which connected this building to the Tower of Paolo III passing over Via di San Marco and Via della Pedacchia and characterizing the views towards the Trajan column.

The photographs taken in 1919 by airship, kept at the Archivio Capitolino, show the situation at that time, but also show the breadth of the incipient transformations.

On the eastern side, the demolition of the building fabric on Via di Marforio and of the blocks facing Piazza della Colonna Traiana is to be completed, the Trajan markets are to be liberated, followed by the complete demolition of the Alessandrino district (Geremia, 2015, 2018).

On the western side from 1928 the demolition begins of the surviving buildings along

Via della Pedacchia and the remaining blocks towards Piazza dell'Aracoeli, and subsequently the demolition of the buildings on the slopes of the hill along Via Tor de'Specchi and then the whole quarter around Piazza Montanara and again towards Bocca della Verità.

The graphic restitution of the demolitions carried out during a fifty-year period highlighted on the Gregorian urban cadastre is as impressive as it is incredible.

On the one hand extensive plots of historical fabric have been definitively erased, on the other there is the loss of identity of places that still exist but are mutilated of their significance. This is evident in particular urban scenarios such as Piazza dell'Aracoeli whose characteristic shape, conceived to visually frame both the staircase leading to the church and the "cordonata" to the Capitol, is today confused by the loss of the eastern backdrop not sufficiently resolved by the arboreal arrangement, which seems a useless palliative to an irreparable urban gap that today we wish to fill with at least the memory of what we have lost.

Recomposition of the San Marco disappeared district

For the scientific recomposition of the San Marco district urban fabric, many different historical sources were critically analysed. The most important reference were the historical documents kept at the Capitoline Archive where it was possible to find both iconographic and documentary data.

The archival documents within the funds of the Pontifical Comune Archive (1847-1870) and of Post-unification Comune Archive (1870-1922) allow tangible evidence of the building and urban transformations that took place in Rome starting from the second half of the nineteenth century.

The archival collections "Titolo 54" and "Titolo 62" are particularly interesting, they are related to the entire period: before and after the unification of Italy; together with the "Ispettorato Edilizio" (1887-1930) and the Piano Regolatore repertories. Within "Titolo 54 - Buildings and ornaments, nomenclature and civic numbering" and "Titolo 62 - Waters and streets, licenses and fines", the requests of building permission are collected. These documents were made by private individuals or different institutions, for the issuing of various types of licenses, e.g. building transformations, merging and recasting, restoration or new constructions (Titolo 54), and for the occupation of public land with different types of structures (Titolo 62).

The Ispettorato Edilizio was the Institution which had the task of verifying the consistency of the projects submitted by the owners with the current Building Regulations; while all the interventions carried out among the general development plan would be recorded into the Piano Regolatore. This brief overview highlights the value of "urban memory" and the scientific importance that the historical documentation assumes when evaluating and understanding urban transformations at the different scale of intervention, and when redesigning, in a physical and scientific sense, a part of the city that has completely disappeared.

The building applications, subject to assessment by the competent Authorities, are often accompanied by various iconographic contents. In addition to plans and site maps, it is very common to find the description of the facades, representing both the survey of the current state of the building and the planned project. The most frequent work were the architectural redefinition of the fronts, or the addition of new floors, with consequent transformation of the pitched roof into flat roof with terraces. These interventions determine a new configuration of the urban skyline (Geremia, 2018).

Having taken 1871 as time limit for the reconstruction of the urban fabric, reference is made from time to time to the first or second drawing, based on the date of the building license application. If prior to 1871, the last transformation will be considered, therefore the *post-operam*. Conversely, in the event of changes subsequent to 1871, the *ante-operam* will be used as the reference, without considering the design project. The cartographic basis used as a reference for redesigning the map of the district is the urban land-register, the Catasto Gregoriano, updated to 1871. Compared to the first map of 1824, the most recent one is completed with the indication of the street numbers and

records the reunification of more properties in single buildings, the new constructions or the demolitions occurred. The cadastral map is taken as a fixed basis on which is then overlapped the redrawing of the plans contained in the archival documents, suitably adapted to the nineteenth-century map so as not to alter the data considered.

The work is supported by a continuous practice of interpretation, evaluation and critical comparison between the various documents, projects and iconographic sources. Since the 1871 land registry establishes an unambiguous image of the city immediately prior to demolitions, the Brogliardo associated with it is considered as a reference platform to which interface data from other sources.

In fact, the Brogliardo as a cadastral register, provides a complete and accurate description of each building parcel. In our case, the interest mainly focuses on the description of the number of floors, necessary for the reconstruction of the building fronts of the single parcels and of the urban fabric in which it is located. This information is taken as an essential basis in order to proceed with the comparative analysis of the archival material acquired.

Every archival drawing is evaluated in its coherence with the related description reported in the Brogliardo itself. If it is inconsistent, the redesign of the building front has always coincided with the data of the nineteenth-century register, assuming that the practice had failed or that the changes in progress had differed from the submitted project.

In addition to this study procedure, we have considered many other historical sources, that give us a likely image of the nineteenth-century city and are useful for critical interpretation. The urban layout of the city and its transformations are highlighted in the many historic views such as the Giuseppe Vasi view of Rome or the contemporary paintings of Vanvitelli and later of Roesler Franz.

Even the photographic repertory represents a further important source: useful representations of everyday life that moves on the background of the ancient fabric of the district. Also worth mentioning, the aerial photographs, taken by the airships, which are relevant for evaluating the development in height of the urban fabric and the conversion of the roofs of the buildings.

In some cases, reference was made to the finding of material relating to single building units preserved in historic documents, other than the Archivio Capitolino ones, or published by authors who did the planimetric and elevation survey of the buildings. In many cases, these are often architectural exceptionalities or the houses of important personalities and families, such as the case of Pietro da Cortona's home in via della Pedacchia, (particles 34-35) (Lugari, 1885). The Collezione Disegni e Mappe - Collezione I, of the Archivio di Stato di Roma, provided documentary material for the design changes to the Sturbinetti house (particles 32-33) and the Barigioni property (particle 62-63), both in via della Pedacchia. Palazzo Santacroce-Gamberucci, previously belonged to Giacomo della Porta, in Piazza dell'Aracoeli, is recorded in Letarouilly's drawings (Letarouilly, 1874).

The archival documents, the design and photographic material does not exhaustively cover the entire area of interest. Where this material is incomplete or completely absent, we have chosen to proceed assuming a redesign of the fronts in analogy with the building types and of therefore of the characters proper to them, as found in the nearby urban fabric in which the building unit is located. The identification of the building type, together with the information provided by the nineteenth-century cadastral document, the site map and the Brogliardo for the description of the building height, therefore allows to proceed with a real redesign of the fronts of the single unit and subsequently for the overall achievement of the entire palimpsest of San Marco district.

Conclusion

The work of redesigning of the building fronts is still in progress, it will find its completion in the definition of a 3D-model, aiming at acknowledging the consistency of the ancient building fabric and the extent of the demolitions accomplished in this part of the city. The perception of the urban transformations made in the San Marco area becomes fundamental to give back an image of a city altered in its original function and spatial articulation. Here the dense medieval urban fabric and the previous street network were repla-

ced by large spaces for ceremonial use (currently sadly configured as a road junction).

The actual configuration leaves gaps of memory and meaningless places which can be filled by understanding the urban development and considering its recent past. In this sense, the work we are carrying out aims to facilitate any urban redesign and reconfiguration of spaces, consistent and focused on respecting the surrounding environment.

Furthermore, the scientific accuracy and effectiveness of the representation make our outcomes accessible to both expert researchers and curious public of visitors.
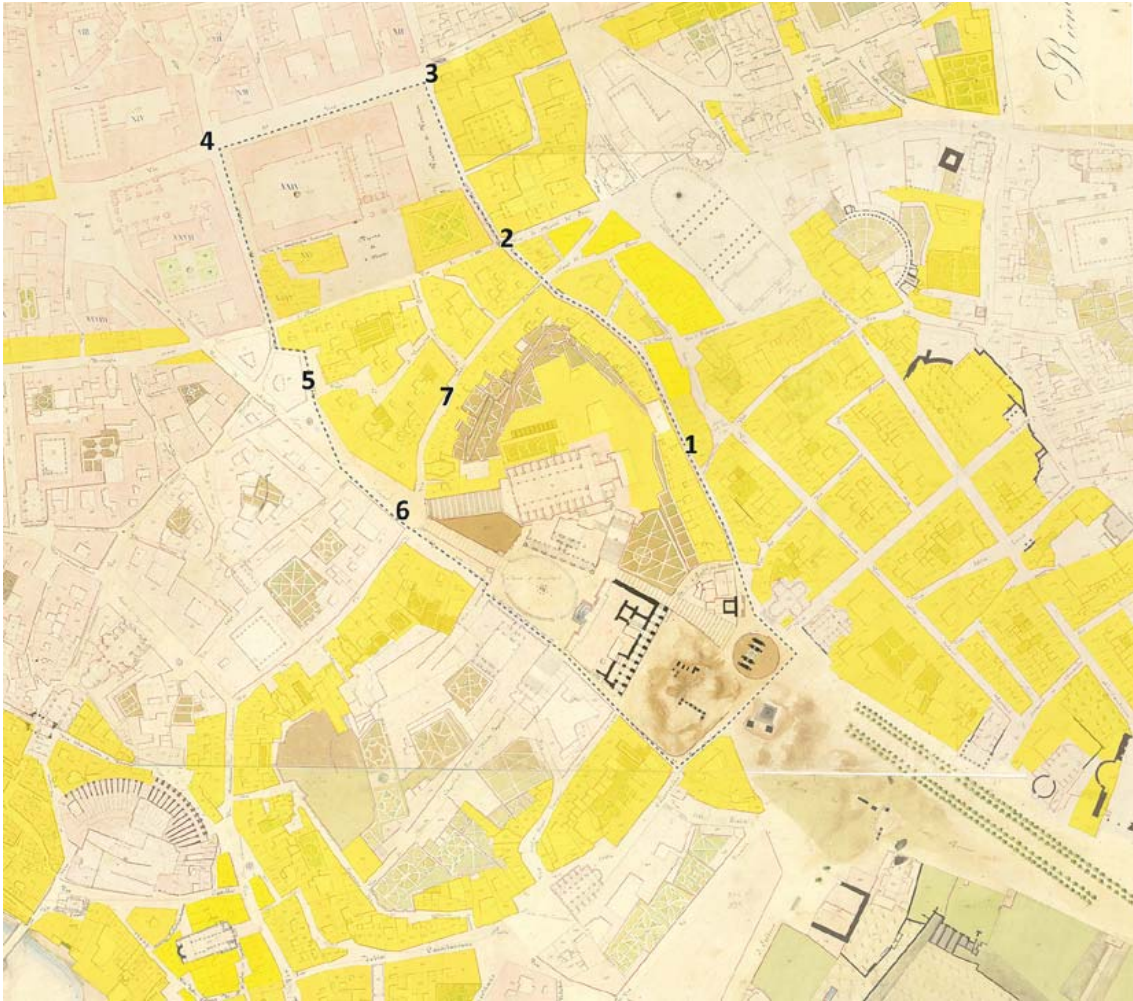
Figure 1. Extract from the maps of Rione Campitelli, Monti, Trevi, Sant'Angelo.

Figure 2. Archivio Storico Capitolino, Archivio Fotografico, extract from the picture n.2362.

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PIAZZA DELL'ARACOELI

| 74 | 76 | 77 |

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─────── **DESCRIPTION CONTAINED IN THE BROGLIARDO 1871** ───────

74: Piazza d'Aracoeli, via di San Venanzio, civ. 6-9. Basement ground floor, first floor, second floor.

Piazza d'Aracoeli, via di San Venanzio, civ. 10-15. Basement ground floor, second floor, mezzanine floor, third floor.

76: Mansion with garden. Basement, ground floor, mezzanine floor, first floor, second floor, third floor, fourth floor, fifth floor (some garrets).

77: Basement, ground floor, mezzanine floor, first floor, second floor, third floor, fourth floor, garrets.

───── **ARCHIVIO CAPITOLINO DOCUMENTATION**
AND OTHER HISTORICAL SOURCES ─────
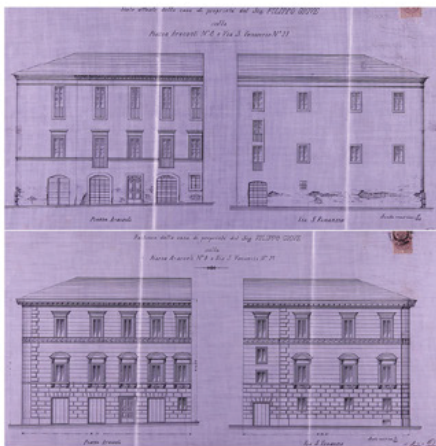
74: AC, Ispettorato Edilizio, Prot. 2184, year 1893
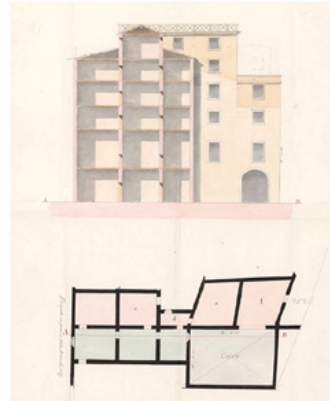
76: Archivio del Comune Moderno Postunitario, Prot. 7213, year 1872
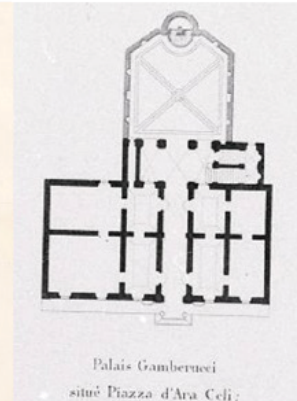
76: Plan of Palazzo Gamberucci all'Aracoeli (Paul Marie Letarouilly,1874)
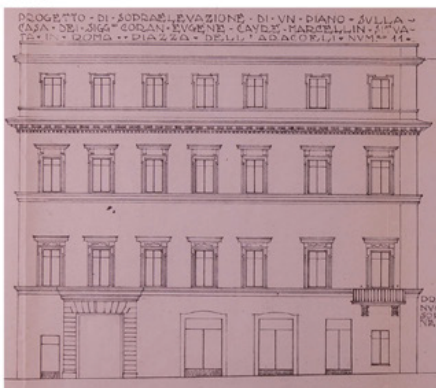
74: AC, Ispettorato Edilizio, Prot. 31135, year 1924

77: Segretariato Generale, Atti Pubblici, year 1878, v48, c1

77: View of Campidoglio and Aracoeli (Gaspar Van Wittel, BNCR: Disegni 3, III, 3)

Figure 3. Piazza dell'Aracoeli.

VIA DELLA PEDACCHIA

| 34, 35 | 36, 37 | | 40, 41 | 42, 43 | | 46 |

DESCRIPTION CONTAINED IN THE BROGLIARDO 1871

34, 35: Mansion and garden. Basement, ground floor, first floor, second floor, third floor, garrets.

36, 37: Basement, ground floor, mezzanine floor, first floor, second floor, third floor, garrets.

40, 41: Basement, ground floor, first floor, second floor, third floor, fourth floor.

42, 43: Basement, ground floor, first floor, second floor, third floor, fourth floor.

46: Basement, ground floor, mezzanine floor, first floor, second floor, third floor.

ARCHIVIO CAPITOLINO DOCUMENTATION
AND OTHER HISTORICAL SOURCES
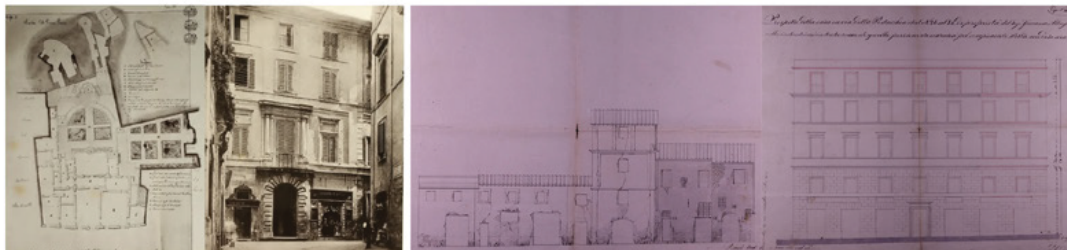
34, 35: Residence of Pietro da Cortona (Lugari, 1885)

36, 37: AC, Titolo 54, Prot. 4580, year 1869

40, 41: AC, Titolo 54, Prot. 11554

42, 43: AC, Titolo 54, Prot. 5919, year 1863

46: AC, Titolo 54, Prot. 25874

Figure 4. Via della Pedacchia.

Footnotes

[1] This work reports the results of the research carried out in Department of Architecture University Roma: "Documentation and virtual restitution of the disappeared urban fabric in the central archaeological area of Rome", (responsible F.Geremia), and it has been object of the case-study analysed within the course held by F.Geremia, M.G.Cianci, V. Varano: "la Struttura della Città" in the 2015-2016 and 2016-2017 editions, it is also now part of the University Research: "The webgis descriptio-romae expanded. A dynamic Atlas for knowledge, prevention of seismic and hydrogeological risk, the fruition of the historic city", coordinated by A.Pugliano.

Captions

Figure 1. Archivio di Stato di Roma, Presidenza generale del Censo, Catasto urbano Gregoriano, extract from the maps of Rione Campitelli, Monti, Trevi, Sant'Angelo. Identification of the area object of the work: 1) Via di Marforio, 2) Via della ripresa dei Barberi, 3) Piazza Venezia, 4) Via del Gesù, 5) Via di San Venanzio, 6) Piazza dell'Aracoeli and 7) Via della Pedacchia. In yellow the identification of the demolished urban fabric.

Figure 2. Archivio Storico Capitolino, Archivio Fotografico, extract from the picture n.2362: "Rome seen from above, Campo Marzio between Pantheon and Chiesa del Gesù, before the construction of Largo Argentina", Stabilimento Costruzioni Aeronautiche Roma, first quarter of the 20th century.

Figure 3. Piazza dell'Aracoeli: restitution of the building fronts. Illustration of the method through the comparison between the Brogliardo (Catasto urbano Gregoriano) archive documents and historical sources.

Figure 4. Via della Pedacchia: restitution of the building fronts. Illustration of the method through the comparison between the Brogliardo (Catasto urbano Gregoriano) archive documents and historical sources.

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Underlying, extended and updated Rome in Valencia: the historic definition of Ciutat Vella as the core city.

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Keywords: *Valencia, historical urban patterns, preexistences, regeneration process*

Abstract

The historical city in Valencia, Ciutat Vella, appears as a single unit into the whole city, but into the former walls there are three main areas from the same number of ages in history. So, there's Roman foundation as the core city until the 3rd century, a Muslim extension into a "C" shape around the 10th century and, finally, an embracing Christian precinct from the 15th century. Each one develops a single urban pattern, according to the territory being occupied. Romans chose an island in river Turia; Muslims filled it up almost as a total built area; and Chirstian city absorbed part of the irrigation system around the city. All those pre-existing lines shaped each urban pattern, and they can also be red in the present city. That 15th century wall precinct became almost the whole city of Valencia till the 19th century, when it had to be updated because of its unhealthy situation and bad sanitary conditions. On the other hand, updating was also a requirement from the Government to develop new extension areas of the city out of the walls: the Ensanche plans. So, in 19th and 20th centuries two main urban renewals were developed in a Haussmannian style, with a special attention to the pre-existing urban pattern and heritage. The analysis of the underlying city centre of Ciutat Vella defines almost a sort of historical urban development model on the large river flood plains all over the Mediterranean area in Europe.

Valencia city in history

Valencia is the third city in Spain and the third metropolitan area as well, both in population and extension. It has a total of near 1,7 million of inhabitants, whose half live in the core city. So, Valencia is the centre of activity for other 46 municipalities around it, and is also the administrative capital city of the region (VV.AA., 1994). A deeper look to its urban morphology and history show an inner complexity further the appearance of unity initially foreseen.

In a first glance on a current map of the city, the general structure of Valencia and its parts are easily recognizable. All the city is organized around a central core, extended through history all over the river flood plain fed by Turia river in whose main, ancient island the city was founded by the Romans. But even a look into this core centre three periods in history developed its current configuration.

Indeed, nowadays the core centre of Valencia looks a more or less homogeneous patchwork or urban patterns, in contrast to the rest of the city. This current central city was almost the total one until the mid-19th century, and it was evident a different part of the city after the hard developing of the 60s and 70 that occurred in all the big cities in the country. In addition, that almost circle outline, the oldest part of Valencia was named *Ciutat Vella*, "the old city".

An in-deep look on a *Ciutat Vella* aerial view shows the existence of a series of inner urban fabrics into that apparent unit, in correspondence with the three main extension periods of the city from Roman, Muslim and Christian re-conquest times. These papers will analyze the persistence of those three historical urban patterns in the current city, and how the different morphologies are still present in the current streets and urban places. They are the origin of their own urban scenes, and they were the basis for the main urban renewals executed in the final 19th century and mid-20th century that followed the 19th century renovation principles. As a conclusion, a series of morphological examples in every existing urban pattern will be collected.

Valencia three main extension moments

Roman Valentia

The origin of Valencia is the Roman foundation of *Valentia* by the Romans in 138 BC. It became an important centre in the middle of the initial Roman conquest of the Iberian Peninsula, and it became soon one its main centres. Its foundation reflects perfectly the military mastery of Romans conquering a new territory: they did not absorb an existing tribal centre whose control should become exhausting and conflictual. Instead of choosing of the two main Iberian tribal centers -*Saguntum* on the coast (current Sagunt) and *Edeta* in the hinterland (current Llíria)- they created a new urban settlement on a -then- great island in Turia river 7 km inland. This location, in the middle of an unhealthy coastal marsh, offered a perfect defensive protection for this new centre. Curiously, the name of *Valentia* for the new city comes from its main objective to be the retirement place for those who demonstrated a real courage (*valentia,* in Latin) on the battlefields. In fact, the first known coat-of-arms for the city was the Fortune cornucopia with the lightning of Gods as the symbol of a warrior prize.

The Roman development of *Valentia* had two periods, corresponding to both republican and imperial times. An initial city pattern in the Republic was enlarged to the East under the Empire, when a great circus was implemented. The Republican Valentia was created on an urban pattern obviously based on two central axis, *Cardō maximus* and *Decumanus maximus*, and a *Forum* area in the middle of this one. All three elements area more or less still present in nowadays urban pattern in this part of *Ciutat Vella* – especially the Roman city gates as the points where both axis got the walls are easily located in the existing *Ciutat Vella* (Pecourt, et alt., 1999).

The Republican Roman basic urban pattern of *Valentia* consist of *insulae* or blocks sized between 35x40 to 35x70 meters, in a roughly East-West direction. In general, there is a constant North-South size for all the *insulae*, but they get longer in an East.West direction as they locat on the farer row from the centre. The Imperial Roman extension continued this pattern to the East until the *Circus.*

The other Roman territorial element is the presence of the road connecting *Valentia* in the territory. the *Via Augusta*. It got the city in a non-rectangle angle in relation to the urban pattern. History confirmed this important axis arriving to the city, and became one of the current streets in Valencia. It has been a continuously extended axis out of the city in its several growing conurbations. This axis reinforced it significance due to Saint Vincent –the current name of this street- who was martyrized along this way in the Late Empire becoming one of the foremost known persons from *Valentia.*

But the Roman fall caused the factual abandon of the city that was occupied again in Visigoths' times. Several municipal archaeological studies show that the new occupation was made by the demolition of the abandoned city and the constructions of the new one over a lay of ruins. That is the main reason why the correspondence between the original Roman urban pattern and the new alignments are not coincident at all, but a hard relationship reflects the Roman lines beneath. [Figure 1]

Muslim Balānsiya

The Visigoth period in Valencia sustained the relative importance of the city in the general scene of the Iberian Peninsula, but with no highlights in relevance. It maintained for around three hundred years as a cultural and religious center around the personality of Saint Vincent the Martyr, until the Muslim conquest. In 711 Muslim troops entered the Peninsula and by the year 900 Valencia was under the Muslim rule. In that moment Valencia became *Balānsiya*. It became a high cultural centre among the Muslim sovereignties in the Iberian Peninsula. In this period the city was widely enlarged covering the most of the original Roman settlement island.

By the 10th century a new Muslim wall precinct was completed, by embracing the Roman city in its East, South and West sides. The original 10th century walls were refurbished one century later, by the 11th century remarking the importance of the city by the construction of a barbican –a second lower wall- all along the precinct and transforming the squared towers into rounded ones (Pecourt, et alt., 1999). In both of them, the main gate was the Southern-West one, *Bab-al-Baytala* or *Portal de la Boatella*, the nearer gate to the place of conquerors' provenance. This area became the main trade and economic centre in the Muslim city – that commercial origin stayed in the area for centuries and was the seed for the huge trade centre in Valencia in the Middle Ages.

So, *Balānsiya* merged both by reusing the Visigoth-Roman city, with the reuse of former buildings, by converting churches into mosques, and building a new castle -*al-Qaşr*- for the local king. On the other hand, the new area between the ancient city and the new walls was occupied by extending the former main urban axis and building a Muslim urban pattern in the spaces among them. So, the main characteristics took place, such as *culs-de-sac* or dead end streets and the presence of huge green courtyards into the houses. Those two characteristics will remain in the city, as can be seen nowadays.

The new Muslim urban pattern does not have any gradation and it develops a sort of spontaneous and informal fabric of streets just to serve walking throughout the city. As can be shown, the new public spaces appear a living entity in an irregular net-shaped pattern where some of the nuts become small squares. The big public spaces stay were the Roman ones were.

Out of the walls, three suburbia -*ravals*- grew by the city: *Raval de Roters* in the North-West, *Raval de Boatella* in the South and *Raval de la Xaria* in el East. They had a Muslim urban pattern as well, that have remained in these areas of *Ciutat Vella* and can be easily identified. [Figure 2]

Christian Valencia

Into the process of the reconquering march to the South by Christian troops all over the Iberian Peninsula, in 1238 the King Jaume I from Aragon Crown took the city of Valencia, and a new rule was established creating the independent kingdom of Valencia into the Aragonian Crown. After the city was re-conquered, the same proceeding of recovering old buildings and places was developed. Former mosques were converted in churches and old palaces by the centre were occupied by the knights coming with the king.

After the conquest, the increasing relevance of the city into the Crown improved a wide, definitive huge precinct finished in the 15th century. In this case, as happened in Muslim times, the main gate of the city was situated on the nearest gate to the conquerors place of provenance, in the Northern gate. So, on the Muslim *Bab-al-Qāntara* or bridge gate -current *Portal de Serrans*- an exuberant example of gothic civil architecture was erected looking to North.

As the former case of urban growing, the space between the Muslim walls and the new ones were partially covered in two phases. In a first step, the main urban axis were extended until the new walls, and a continuum of buildings provided an urban scene till the gates (Pecourt, et alt., 1999). Among such corridors, several vacant spaces remain for future urban developments until well into the 19th century.

The whole old city was precisely drawn by P. Tosca in 1768 which is the first, liable map of the city in history. Not for nothing was named "geometrical map" of *Valentia Edetanorum*, due to its accuracy that makes it to be a staff-photography of the city in that time (Pecourt, et alt., 1999). In fact, its high resolution and rich detail improve the location of archaeologic elements in the city, such as towers of the 11th century in Muslim walls that were hidden into the blocks.

In that 1768 plan a huge space in the centre of the city can be found: that is the Market square -*Plaça del Mercat*- the biggest in the city. And, as it couldn't be in other way, the main, huge trade square grew on the Muslim *Boatella* trade area by the Southern Muslim gate (Pecourt, et alt., 1999). As the trade had a great increase in the young royal city, a modern new building was built to house the first bank in Europe: *La Llotja* -the loggia-. Its origin consists in the garden bank -or *banca*- used to change coins between merchants and moneylenders. *La Llotja* finally is a civil gothic masterpiece building constructed by the same master builder in *Portal de Serrans* gate, Pere Comte.

On a nowadays aerial view of Ciutat Vella appears the final result of the urban pattern formation into this last urban area between Muslim and Chrstian precincts. A total of 9 main different urban grids fulfilled that space from North-West to South and East. Those orthogonal grids adapt to the orientation of main ways out of the city, and develop sizes between 70x70 m the bigger one to 30x20 m in the smaller, with medium seize of 60x40 m. The detailed areas along that arch are *Sogers*   (70x70 m), *Mercaders* (60x60 m), *Velluters Nord* 860x30 m), *Velluters Sud* (60x40m), *l'Eix Boatella* (70x50 m), *Sant Pau* (70x30 m), *Peixcadors* (30x20 m), *Universitat* (50x30 m) and *Sant Bult*   (70x25 m).

Thus, these urban grids shaped a collection of urban patterns within the city walls that became the apparently unified *Ciutat Vella* area. They show a sort of patchwork formed by the old vacancies of land between the ranges of ways out of the city. Some of these way out streets extend original Roman main axis as an urban *continuum* - in this case, the extension of *Decumanus maximus* and *Via Augusta* are easily recognizable as *Quart* and *Sant Vicent Màrtir* streets in nowadays city. [Figure 3]

Valencia urban renewal updating

In the 19th century the city started to collapse because of an uncontrolled growing in horizontal and in vertical ways, on the floor and in height. Thus, an extensive filling-in of the urban pattern built every vacancy space into the walls as the inner free spaces into the blocks were also occupied by the extension of the buildings deep into the lots. On the other hand, buildings were raised from 2 or 3 until 5 or 6 story high, what made the streets get darker and less ventilated. As a result, bad conditions increased in the urban space and in the city living conditions as well. That was the start for developing a general Inner City Renewal Plan -*Proyecto de Reforma Interior*-, where a general sanitation of the city in the way of the urban renewal interventions in the Haussmannian Paris originated by keeping sanitary measures.

19th Carrer de la Pau

In that context, two main interventions represent both 19th and 20th centuries updating of *Ciutat Vella* in modern times (Aymamí, 1912). In the last decade of the 19th century a new straight, "wide" street was opened to connect the city with the sea: *Carrer de*

la Pau. It was built between 1883 and 1903, and it is a perfect sample of Haussmannian urban renewal intervention in both the trace and the aesthetics (Pecourt, et alt., 1999). It is the first absolute straight line between the central area of the old city and the East gate to the sea. In addition, it collects a series of buildings in a homogeneous late 19th century style that gives the street a modern, metropolitan-in-that-time atmosphere.

The new *Carrer de la Pau* Street covers an area south to the Roman city, but whose urban pattern is a southern extension of it. So, in a way, this new street adapts and updates the Roman pattern in the 19th century, because of the same angle to North direction than the original Roman orthogonal urban grid.

20th Avinguda de l'Oest

On the other hand, in the beginning of the 20th century a bigger avenue on the West of *Ciutat Vella* was thought and planned after the successful execution of *Carrer de la Pau*. In this case, an ambitious program covered a wider avenue with higher buildings crossing the whole Ciutat Vella from South to North-West, connecting the ancient Via Augusta with one of the bridges in the riverbed, the *Pont de Sant Josep* (Sánchez Lampreave, Monclús and Bergara, 2011). It was planned in three phases due to its size, almost the double of one of its forerunner interventions in Paris, the *Avenue de l'Opéra* (Benevolo, 1978).

But the money, and the coming of the Spanish Civil War delayed the project that was finally approved just near the war, in 1931. It was finally started in the beginning of the 40's with new rationalist architecture samples, on a proposal of the 30s following the late 19th century town planning technics. Although its extemporary proposition, all those components produced a unique mix of city and architecture over a medieval lot area that represents one of the richest modern urban spaces in Europe.

The old, mediaeval blocks in *Velluters* quarter were cut to host the new buildings to form both façades of *Avinguda de l'Oest* (Pecourt, et alt., 1999). The adaptation to the existing mediaeval urban pattern created a majority of lots in sharp corners whose geometric issue became fashionable round corners tailored to host further rationalist expressionist buildings.

But the huge effort of the project, in a post-war time economically depressed produce a continuous delay of the buildings. They merged in an offset arrangement, without following an original plan ordered from the municipal administration. Instead, buildings were erected independently in the blocks, at least only in the first of the set of three phases of the original plan. So, in the beginning of the 70's, when the first phases were completely build, the municipality decided to continue the avenue throughout the old town. In this time started to appear the first protection theories on architectural heritage, what led an increasing opposition to continue the avenue. It was definitively abandoned in 1975, leaving an uncompleted urban space as a main road to nowhere (Colomer et alt., 2002).

Despite the problems and circumstances in the avenue execution, its set-up on the mediaeval urban fabric produced a certain unification of South-West part of *Ciutat Vella*. Surprisingly, this new line in the historical city connected the two extension of Roman axis described above, the *Decumanus maximus* and *Via Augusta* or *Quart* and *Sant Vicent Màrtir* streets in current city. [Figure 4]

Conclusion

The Roman urban pattern of *Valentia* is still readable into the central core of *Ciutat Vella* by studying the almost orthogonality and proportions of many blocks in the area. The fact of the total destruction of Roman city and recovering into Visigoth one is the clue of the geometrical mismatch among them. The two main urban axis in Roman *Valentia* remain extended in every period of the city enlargements, especially in both extensions of Muslim and Christian city walls.

In a way, the Roman city has been characterized as ubiquitous all over the centuries. *Decumanus maximus* and *Via Augusta* are the direct samples of that updated presence of the Roman city for subsequent centuries. In addition, the second one became one of

the current longest streets in Valencia.

The final updating of *Ciutat Vella* core city along the 19th and 20th centuries are in close connection to Roman urban pattern. The 19th century urban renewal - *Carrer de la Pau*- lays in parallel to Roman grid, while the 20th century urban intervention -*Avinguda de l'Oest*- is a new axis connecting the extension of the two main axis in Roman *Valentia*.

Those points show the perpetuation of the Roman settlement more than 2.000 years ago, what is a certain case of updating of the extended underlying Rome in Valencia. [Figure 5]
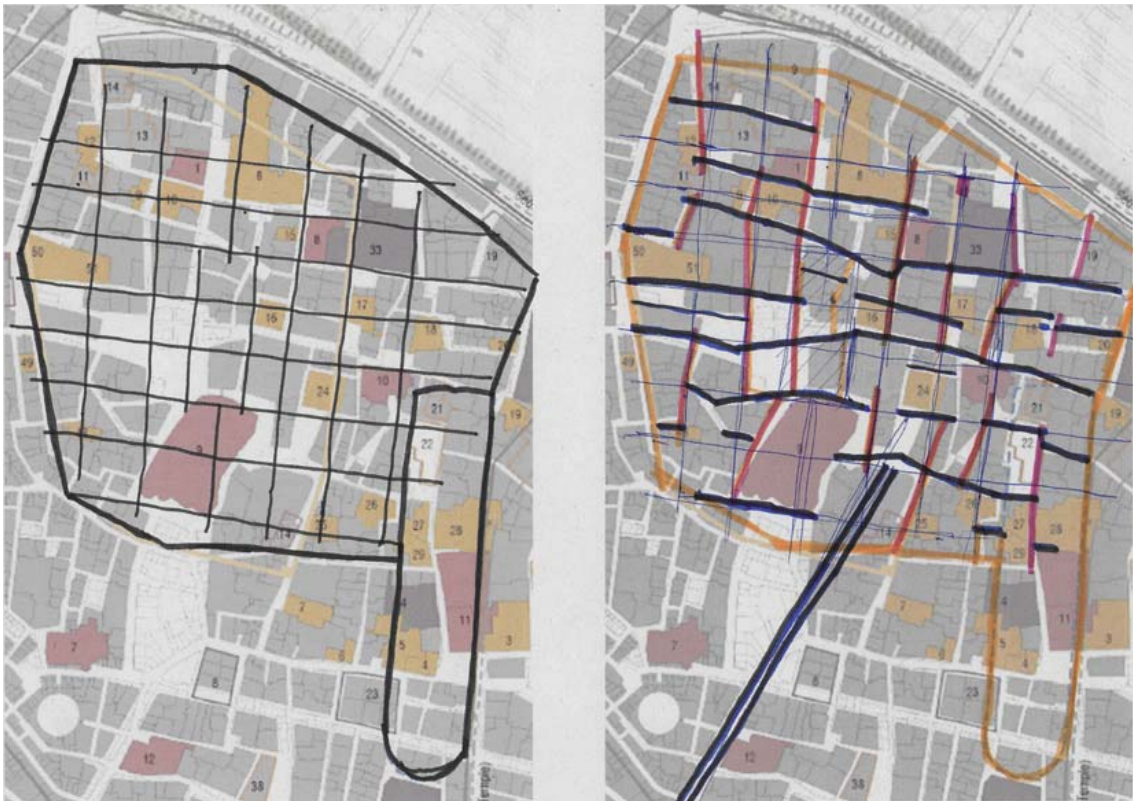
Figure 1. Original Roman urban pattern and the new alignments.

Figure 2.

Figure 3.

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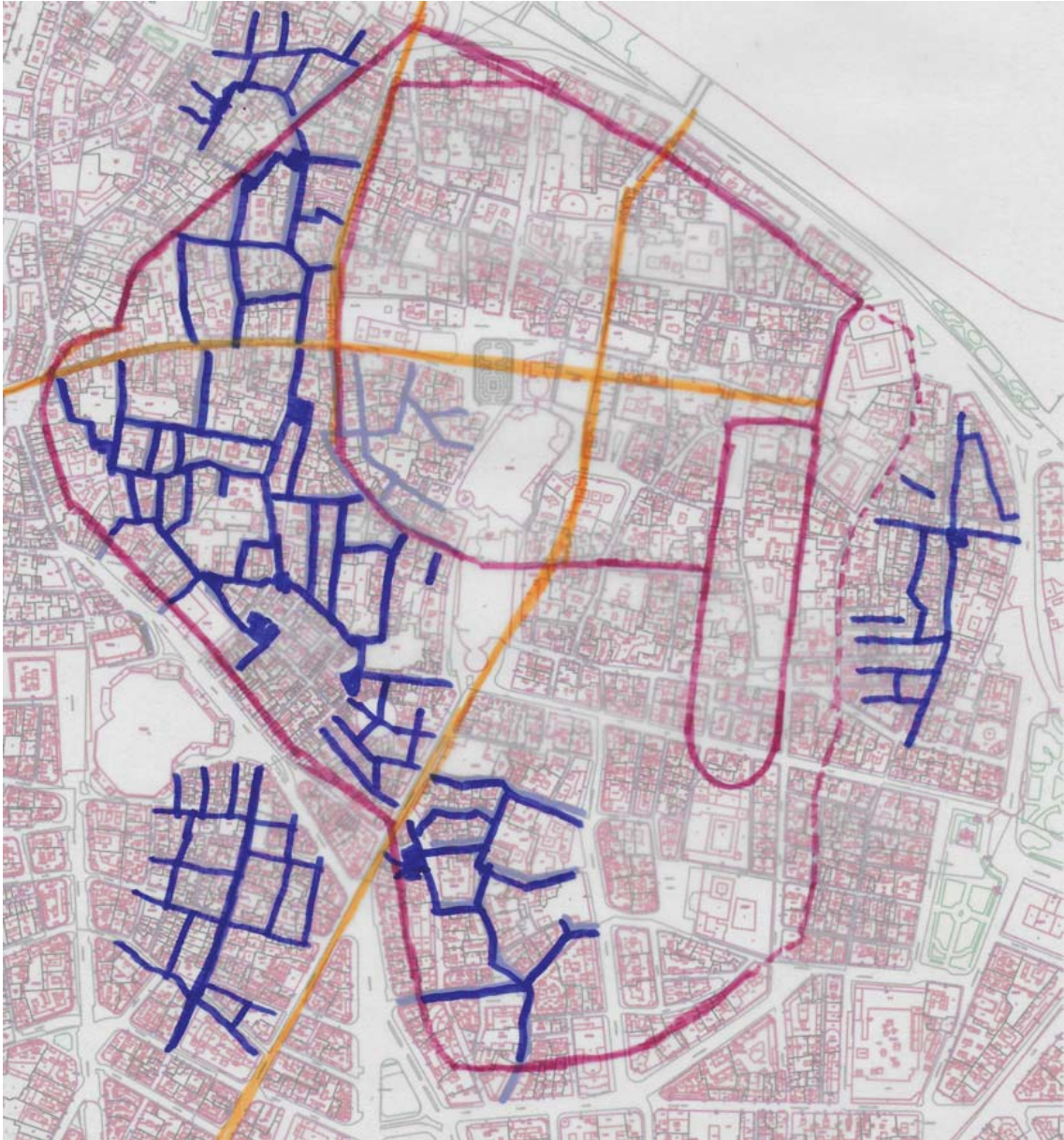
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Why an Atlas?
Reading of the cultural substrata of the Portuguese urban fabric

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Abstract

The present paper aims to demonstrate the importance of a morphological atlas in the characterization of the urban elements that composed the present city, particularly on the reading of the cultural substrata of the Portuguese urban fabric. This work intends to be a synthesis of the research project Portuguese City Morphological Atlas under construction over the past decade, considering the public and private components of the urban fabric: the square, the street, the urban block and in its currently final phase the built typologies - refracted through the "common building" and "singular building".

The project aims to build an interpretative database that will be an irreplaceable tool for reading, research and even to intervene in the urban fabric. In this sense, the work as a whole and in each of the parts that compose it, seeks to achieve two main objectives: The first is to provide an educational tool for the study and teaching of architecture and urban planning. The second is to provide an instrument for reflection and practice of urbanism, a collection of types made from concrete and known examples, treated and assumed as typological basis for the conception of new interventions.

In graphic terms, the work has as an objective to characterize each case study in an identical and comparable way, i.e. using the same representation codes and the same scales, from a series of reference drawings, interpretative diagrams, photographs and texts, addressing to the built fabric and its components from the viewpoint of genesis, morphology and primary uses.

1 Theoretical framework
Subject

The city is a complex object, place of memories consolidated by reinterpretation processes of the built past in a long time. The city is no longer an object that grows indefinitely, but a built physical support constantly renewing. The current city cannot be the same as the 19th century, remaining only a few timeless elements that comprise fragments – a memento – of a previous moment.

The philosophy of intervention in cities and the idea of the city itself have been displaying less utopian signs than in bygone eras, due to several factors. These include the Modern Movement crisis and its models, and getting back to cities as points of reference, as well as the perspective of, if not disjunction in cities, then at least their illegibility in terms of traditional urban morphologic concepts.

The uncontrollable expansion of urbanisation and the unsustainable nature of the travelling linked to it, the distance to public amenities, all in all the lack of urbanity has meant that serious attention is being paid to the design and sedimentation forms and processes of consolidated cities. For this phenomenon to have a positive effect, it cannot imprison urbanity in the historical centre, nor should it be inevitable that rebirth need fall back on past forms. However, the built examples that we have inherited and that are part of our city lives will always be models that act as drivers for new spatial concepts, and the processes behind their origins methods for the sedimentation and restructuring of urban fabrics.

Although the use of graphic illustrations as a base for studying and divulging knowledge of urban forms goes back to the initial German treatises on urbanism that were published at the end of the 19th century, particularly the works of Camillo Sitte and Joseph Stübben, classificatory studies appeared much later, the most important being the work published by Pierre Lavedan in 1936.

Of particular note, are the works of Robert Auzelle and Saverio Muratori, especially because of their importance between several others influences that this Morphological Atlas received. It was in the "Encyclopédie de l'Urbanisme" (AUZELLE, 1950) that Auzelle approached the issue of the different morphological features making up the urban fabric by methodically analysing them in a standardised way. Despite the cases represented being grouped by category, so as to transmit a precise, clear and complete idea about them, they take on the autonomy of the feature shown – not confirming or exemplifying any thesis or order.

In the other hand, for the building typologies is the work conducted after the war by a series of Italian figures such as Saverio Muratori's work (MURATORI, 1959) that stands out as a crucial analytical reflection on the physical component of Italian cities. He tried to define tools for analysing urban morphology from the concepts of type and typology, setting out concepts of growth, typology and morphology.

After these, a series of studies has gone to the printing press over the last twenty-five years, contributing significantly to reflection on cities through looking at their forms. More tangibly, for the effects of the topic suggested for this project, one can highlight as illustrative the works of Philippe Panerai in France, the works of Giancarlo Cataldi in Italy, those of Manuel de Solà-Morales and Xavier Montes in Spain, those of Anne Vernez-Moudon and Mario Gandelsonas in the U.S.A and also the Dutch Urban Block Atlas coordinated by Susanne Komossa, Han Meyer or even the atlas of Urban Grids edited by Joan Busquets and among others.

In order to develop the Morphological Atlas of the Portuguese city, the Formaurbis LAB research group was created in 2006 at the Faculty of Architect of the Technical University of Lisbon. Its creation arose from the educational work carried out by teachers and students in the study of public spaces of excellence in Portugal – the square. The results of this work have been published in 2005 for the study of cases in the Azores (DIAS COELHO et al. 2005) and in 2007 for the Mainland inventory (DIAS COELHO et al. 2007). This relationship with education, particularly in the approach to urban form, aims to transform the Morphological Inventory into a pedagogical tool. The students are involved in a process of collection, graphic restitution, illustration and description of the diversity of elements that make up the urban fabric of Portuguese cities.

It is important to highlight, due the inventory morphological intention time and the different composition phases of the elements in analysis are not excluded. Despite their graphic

representation being made in the found shape and space, their different stages of sedimentation and their possible relationship with other similar cases are always considered.

In this sense, two fundamental axes for the reading of the city are considered according the theory of Ferdinand de Saussure: the succession and the simultaneity. The first means time or evolution, expresses the process of transformation of the city in a long time, identifying each movement of is sedimentation process. In the other hand, the simultaneity means the synchrony has to do with the possibility of the same phenomenon occur in different realities at the same time, it allows the comparison of convergent and divergent situations. The classification process is a rational and scientific method that allows to group heterogeneous spaces and buildings by families, in this particular case morphological characteristics related to the nature of the urban form.

Through this wide research it will be possible to compile for the first time an atlas of urban forms in Portugal. Although supported by methodologies that have been used in previous international research works, this approach deals with all features of the urban form in a cross-cutting and integrated way, and has never been developed or even attempted elsewhere. It includes tackling the urban layout, the two main features making up public space and private spaces in the city, approached first from the series unit of the built fabric and in the current final stage the typological study of the buildings, both ordinary and singular.

Objectives

The Morphological Inventory, both as a whole and in each of its constituent parts, aims to satisfy three main objectives. The first is to provide a didactic and pedagogical tool for the study and teaching of architecture and urbanism that will prove as fundamental as cartography itself. The second is to provide a tool that can be used for reflection and practising urbanism, not by proffering models that are immediately operational, rather by providing types that consist of tangible, well-known examples that are dealt with is such a way that they can be taken as reference points for the conceptual stage itself. The third and most ambitious objective is to set up a thorough database of readily available, high quality information, which will enable not only the research group, but all.

The selection of cases is supported by a strict methodology based on archive search, architectural survey and bibliographic reading. Specialists in this subject area to have access to a unique source of material for conducting and extending research on urban morphology topics, standing as a resource bank of material on Portuguese cities.

In methodological terms, researching and producing the features are based in an exhaustive fieldwork in which the whole country is visited. This research includes analysing existing information available in bibliographic references and archives of technical departments of the different municipalities, and central administration services, sheets of cases considered to be the best for typological representation its drafted.

Regarding the selection of case study, in each phase, a classification table is construct considering criteria such as the morphological characteristics, topological relations, the origin and formation processes, the historical context of its production, and also the spatial organisation and functional structure. For the construction of the inventory, about 100 cities in Portugal, homeland and islands, are considered.

This inventory needs to translate the diversity and wealth of situations present within the scope of the study universe, selecting examples that are representative of different periods or the result of lengthy sedimentation, of different morphological characteristics, functions and typologies and their distribution throughout the country.

In terms of the graphics, the aim is to characterise each case study identically and comparably, i.e. using the same representation codes and on the same scale, using a series of bespoke reference pieces, interpretative diagrams, photographs and explanatory texts.

Methodology

The encyclopaedic objective of the research means the examples studied need to be handled synthetically and follow a standard model in order to enable comparison between the various selected cases, and depiction of their cellular nature in making up the urban fabric and building typologies. In this sense, the case studies are then represented in two

complementary systems: systemic decomposition and elementary decomposition.

The systemic decomposition consists in the representation of the systems of the city through the urban fabric, namely the urban layout, the topography and the plot pattern. This draw features vary from a scale 1:5000 to a 1:1000.

In the elementary decomposition, are addressed the public and private components that compose the urban fabric: square, street, urban block and the buildings organized in common buildings and the singular buildings. For each one is identified his morphological region, a specific group in a heterogeneous urban fabric with similar, constructive or typological characteristics. The drawings are represented from the 1:1000 to the 1:200 scale.

These graphic elements features are accompanied by axonometric perspectives that show the relation of built form and the private and public spaces; occupation ratios graphics that will be used for comparison purposes; photographs of the environment considering the perspectives deemed to show the spatial characteristics of the space; and exceedingly concise descriptive interpretative texts that delve into the urban element origins, morphological description, spatial organisation and its functional structure.

2 Phases of development

The Morphological Atlas of the Portuguese city is organized in two parts - the public city and the private city -, implemented in past decade in four individual research projects. The public space is study through the representation of the street and the square, both research projects are completed. The private space, was first approached by the built fabric unit - the urban block, project also concluded; and in this current and final phase the building typology. In each phase, the city is study and graphically represented acknowledging the urban fabric and the urban layout diversity.

The Square

The first phase[1] of the Morphological Inventory started in 1998 based on a work developed in the two academic years in the urban design studios at Lisbon School of Architecture.

The project had an educational objective, aiming to involve students in the study of the urban form through the inventory, graphical synthesis and analysis of the squares. The idea was to build a graphical table of morphological classification of the space and a metric table of its absolute dimensions from the characterization of this exceptional public space.

Through the inventory, it was possible to construct a graphic and comparative synthesis of the typological diversity of the squares, including their integration in the urban fabric, evolution, dimension, use and formal hierarchical enhancement with the building or other elements that compose them.

Thus, a set of synthesis drawings were made considering: the three-dimensionality of the square integrated in its urban context, represented by an aerial photograph and an axonometry; the urban layout, a two-dimensional abstract representation that makes it possible to represent the relationship between the constructed and the void, in the scale 1: 5000. And, the square was represented by classical representation elements, such as plans, sections and elevations in the scales 1: 1000 and 1:500.

Another important contribution was the construction of the squares and urban layouts comparative tables. Draw on the same scale the tables are essential conclusion for an extensive knowledge and interpretation of the existing diversity, considering issues such as typology and shape variations.

The Street

The aim of this second part[2] of research project was to create a graphic and descriptive inventory of the urban element "Street" in the Portuguese context. The approach was one of taking public spaces that are generically labelled streets, even if the varied terminology in Portuguese differentiates between them, such as: "avenida", "alameda", "calçada", "zbeco", "escadinhas" which in English equate to "the street". Spaces that typologically act as a close space, like a square, where excluded. If spaces, originally or at one time or another, had a clearly identifiable sub-type or affectation, as they developed the clarity of these distinctions often became foggy.

As urban features, the selected spaces are an integral part of the urban fabric, possessing a formal, functional hierarchical relationship with the other features that they comprise. In this way, analysis could not ignore the context, and the spaces chosen were always approached as being part of a whole.

From an ensemble of some 300 cases, bearing in mind criteria such as the object's quality, typological representativity and physical area, were selected a final of 130 cases studies for graphic restitution and bibliographical fact-finding. The representation methodology of was embedded in the established criteria for the Morphological Inventory, above explained.

The urban block

This third phase[3] of the morphological study of Portuguese cities intended to represent the private facet of cities from their urban organisation unit, the urban block.

Following the methodology establish for the Atlas construction and sedimented in the previous phases, it was produced a classification frame considering its typological, morphological and functional nature of importance as regards the surrounding urban nucleus and representative of the national territory diversity. Additionally, the characterization addressed both the urban feature, the urban block, as well as its relationship with the public space.

As a sample for the inventory, were selected 80 case studies to developed a graphic synthesis in digital format. This synthesis drawings have a degree of detail that implies the execution of each urban layout from a blueprint scale of 1:5000, showing the relation between the urban block and its urban context; one figure-ground plan at 1:1000 scale, showing the occupied area vs. the free space of the urban block; one representative floor plan and sections of the selected urban block at a scale of 1:500 with its context, in order to enable the relation between different occupations/partitions of the private space and the immediate surrounding public space to be evaluated.

With the research it was possible to provide insight on urban block occupation, their history, organisation of the buildings and the relationship with free private spaces and with public space itself.

Complementarily it was produced a comparative typo-morphologic table consisting of each class of the Portuguese reality, allowing the depiction of similarities and variants, morphological dimensions considering time and shape, constituting a synthesis of the morphologic diversity of the Portuguese city urban block.

The building typology

This undergoing final phase[4] has the proposes to study the building typologies, providing insight on their origin and evolution, spatial organisation and functional structure, dimension, density and occupation, and the relationship with free private spaces and with the public space itself, concluding the projected universe for the morphological atlas of cities in Portugal.

Using prior information collected from the previous phases of this Morphological Inventory, but mainly through exhaustive field work and materials available in the technical departments and archives of local municipalities, also in public libraries, is being developed a graphic restitution of the main examples of building typologies – as portrayed by the common building and the singular building. These two categories will need to take in very different situations when applied to consolidated and sedimented urban fabrics, buildings stemming from concepts linked to different periods of construction, transformation or many other contemporary situations with which the research will have to tackle with.

The methodology established so far intended to define the selection criteria and previous classification of the case studies, based on the representativeness of the Portuguese territory of the continent and its diversity.

A previous selection of case studies aimed to identify the universe of about 1000 case studies and to previously select a set of 250 built typologies, 120 of which will be part of the final inventory. The selection of case studies was based on evaluation criteria that consider geographic representation, historical, typological, morphological features and the state of progress of each built typology taken individually.

Thus, the buildings are represented by classically drawn features, one urban context plan

at a scale of 1:1000, representing the layout of the built fabric and configuration of the public space; plans at a scale of 1:200, representing the entrance level and a typical floor; one elevation and one cross section at a scale of 1:200 portraying the façade composition and how the different floors fit on each other and how the building relates to the public and private spaces;

Complementarily, as it was done in the previous phases, a first approach to a type-morphological classification table is being carried out intending to relate the identified cases with an architectural type hypothesis. The table is intended to be a synthesis of the morphologic diversity of the Portuguese city building typologies, considering: the building types and their variations; the buildings timeline, underlining the sedimentar or project-based origin of each building; comparative charts of three-dimensional diagrams and accessibility systems and dwelling organization.

3 Pedagogical and scientific usefulness

Pedagogical usefulness

The pedagogical approach that has been carried in classes by the professors involved in the research group, is a translation of the work developed in the research laboratory, adapted to the level of the students and the aim of the discipline. In the classroom, the interpretation of the urban object is subdivided in steps, each one an elementary exercise with simple rules that stimulate student's creativity and autonomy within a precise code of representation and model building. The coded representation of reality in plain mono material models allows reducing the complex nature of the city, extracting essential layers for its understanding and aiding students learn to interpret and also to select the project composition themes by rational abstraction.

In the first cycle of studies (bachelor degree), emphasis is placed on the interpretation and decoding of the urban shape; in the second cycle of studies (Master degree) the usefulness of the interpretation translates in innovative design proposals based on the codes of the existent city shape; third cycle students (PhD degree) are encouraged to use a comparative approach based on systemic and elementary decomposition of study cases to test research hypothesis, thus allowing to sustain their research on a grounded methodology that uses an essential disciplinary tool, drawing.

Simultaneously, scholarship students are integrated in order to enable them to get a foothold in this subject matter and aid their own progression through their own paths. The students take a privileged hands-on role with the vast amount of fieldwork, archive work and quality control of the obtained results. Fieldwork surveying and subsequent graphic restitution is the particular responsibility of the scholarship students.

Through the research the students have access to a compiled support bibliography, selection of documents, which in some way are shown to be useful while carrying out the study, broken down into main areas encompassing reference works, monographs and cartography and planning studies.

For example, in each phase of the construction of the Atlas, where produce Master and PhD theses, such as: (i) a study about the reciprocal relationship between the monument and the urban context in the transformation of the squares in the Portuguese heritage intervention context; (ii) The "Rua Direita" (Portuguese Strait Streets) in the Portuguese cities producing a typo-morphological reading of the urban element in nowadays; (iii) Through a typo-morphological reading of 12 urban blocks of the city of Lisbon, is being developed a PhD study that approach the urban block as a basic system of urban production of the contemporary city; (iv) or in the research of the roman building typologies and its influence in the Portuguese urban forms, its persistence and its process of transformations through time.

Scientific usefulness

The Formaurbis LAB began working on the topic of urban morphology roughly fifteen years ago and since then has conducted different pieces of research, both individually and as a group, interlinking the different morphological elements that compose the urban fabric and disseminated the results.

Nevertheless, prominence should be given to the "morphological atlas of the Portuguese

city". After concluded, as can be seen from the already finished phases that have been published, will enable the study and dissemination of the topics through the selected methodology, i.e. tackling the urban fabric and its components through classical representation methods of the structures, as well as through using auxiliary graphic, photographic and descriptive tools, examined with all the due rigour of our field, yet remaining legible to the general public.

Complementarily, the publication on "Cadernos de Morfologia Urbana - Estudos da Cidade Portuguesa" that is a collection about notebooks on study of the Portuguese urban form, consists on a series of transversal researches conducted by scholars with distinct perspectives that articulate and use the different concluded parts of the morphological inventory. In 2013 (DIAS COELHO et al, 2013) the first volume was published and was dedicated to the Urban Elements and focused on the elementary decomposition of the urban fabric. In 2014 (DIAS COELHO et al, 2014) published the second volume of the same book collection, dedicated to the Time and Shape of the city, which focused on the role of time in the formation of the urban form.

So, at the end, this interpretative database will thus constitute an irreplaceable tool not only for analysis, research and intervention in cities in this century, but also for architectural composition and creation. Furthermore, the relevance of the tool is enhanced due to being launched in a period when the growth of cities is no longer the paradigm in developed countries, but rather the reinterpretation and reutilisation of the existing built structures.
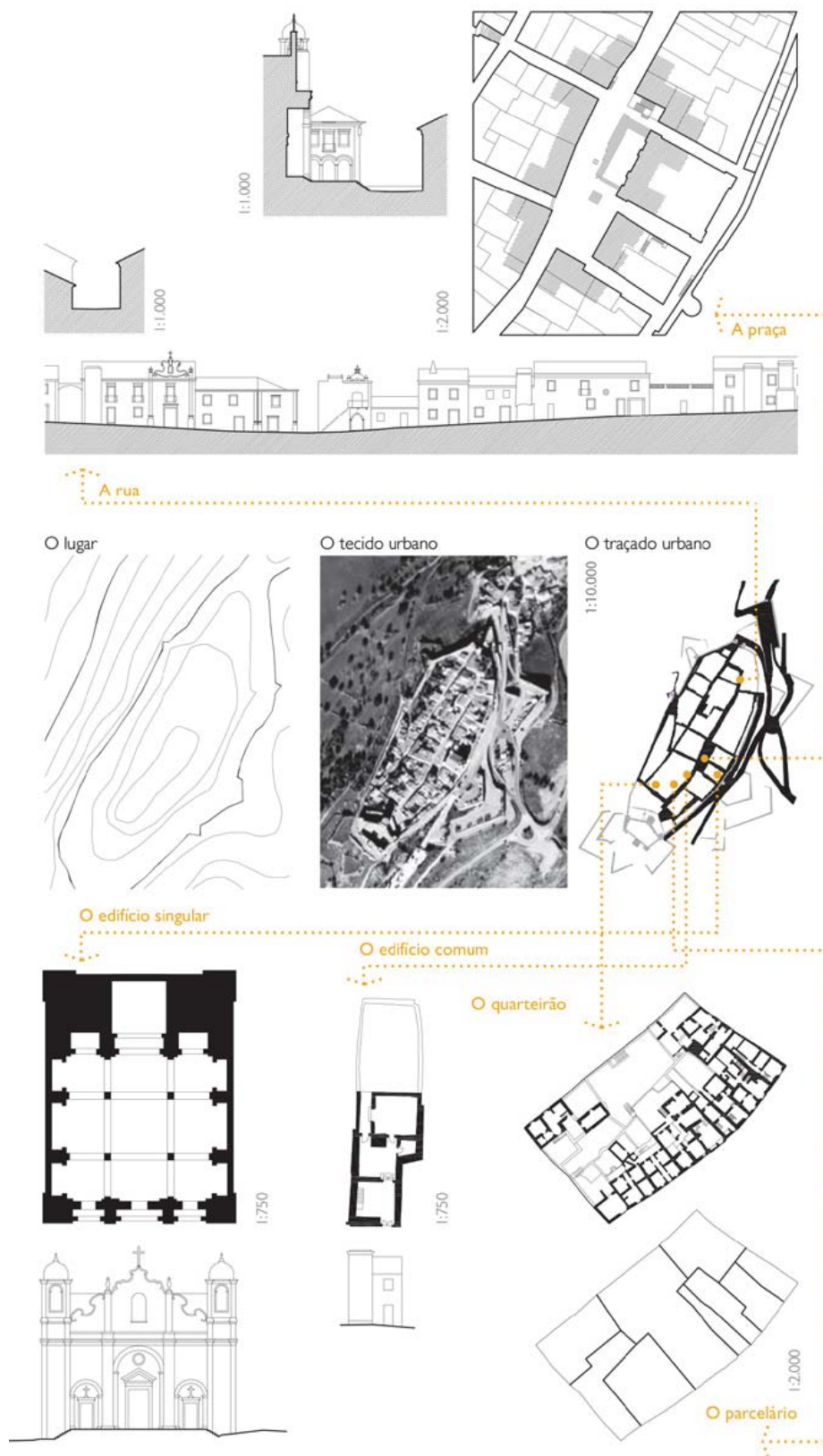
Figure 1. Elementary decomposition of the urban fabric, Monsaraz. in Dias Coelho, C. (ed) (2013), Os Elementos Urbanos. Cadernos de Morfologia Urbana, Estudos da Cidade Portuguesa n.º 1, Lisboa, Argumentum, p.34

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Footnotes

[1] The first phase of the Research Project - Squares in Portugal. A public Spaces Inventory - was funded by the Directorate General for Land Planning and Urban Development for the mainland (2005) cases research; and the Regional Directorate for Land Use and Water Resources in the cases of the Azores (2007).

[2] Second phase of the research project: "The Street in Portugal. Morphological inventory", funded by the FCT with the reference PTDC/AUR/65532/2006 and developed from 2007 to 2011.

[3] Third phase of the research project: "Urban Fabric in the Portuguese City. Morphological inventory", funded by the FCT with the reference PTDC/AUR-URB/111835/2009 and developed from 2011 to 2014.

[4] Fourth phase of the research project: "Building Typology - Morphological Inventory of Portuguese City" and funded by the FCT with the reference PTDC/ART-DAQ/30110/2017. The project was started in 2018 and is expected to end in 2021.

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The concept of morpho-typology in the Alberobello urban organism

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Abstract

The proposed topic on the city of Alberobello is the result of research carried out within the Degree Thesis Laboratory promoted in the Dicar Department of the Bari Polytechnic. The analysis carried out at the settlement scale follows the aim of reconstructing the development phases starting from the formation of the original nucleus up to the mature structure conquered in the 19th century.

The city was born close to a "blade" and is made up of two different nuclei characterized by irregular paths conditioned by the morphology of the soil. The original structure of the city has been reconstructed from a historical map, from the beginning of the 17th century, in which some rural aggregates appear on the promontory of Aia Piccola and, near the paths drawn longitudinally to the topography, in the slope of the Rione Monti (both the nuclei are part of the UNESCO perimeter). The connection logic of the bands pertaining to the linear trullo[1] systems seems to be comparable to that typical of medieval systems with an initial construction on a "matrix" path, a subsequent one on planting path and, sometimes, with the closure of the block through the building on the connecting path. Similarly to other similar configurations, the hierarchical relationship of the routes may vary in relation to the coexistence of several pre-existing or planned routes, determining a different role of the built.

With the reading of the relevant areas and the hierarchical definition of the routes, the relationship that was established between the aggregates that make up the blocks present especially in the Monti district was reconstructed. This critical operation, carried out by recognizing the building types and the aggregative method with which they relate, despite the scarce documentary elements available, will make it possible to suggest a perspective of possible urban recovery by providing for the integration of all functions and attitudes (residence, services , commercial activities, etc.) that define the urban organism. Thus trying to reverse the current trend in which all the fabric is destined only for tourist-accommodation purposes that deny the typological-functional mix that would make it a city in the proper sense.

Introduction

The research about Alberobello city produced as part of the activities of the Thesis Laboratory, coordinated by Professor M. Ieva and by students Di Gioia Miriana, Leone Francesco Maria, Regina Rossella and Schiavone Fausta at Polytechnic of Bari. It reconstructs the formation of the different construction phases of the famous city of Valle d'Itria.

The typological-procedural analysis performed at the various scales of the anthropized space allowed us to recreate the dynamics of the cities' formation included in this territorial context.

The method applied to the territorial scale, extended to an area which includes the central and the southern parts of Puglia, highlights the birth of the first settlement as a progressive union of rural cores, close to a natural impluvium, at the confluence of important territorial rules.

Formation of the settlement and urban core

The urban development of Alberobello began in the 17th century and, without interruption, continued until the early 20th century. An undoubtedly important date was May the 27th 1797, when Alberobello gained the status of royal city and independent municipality.

Among the first decisions, it was authorized the construction of houses with the use of bricks and mortar, as the houses were previously built only with drywalls.

Subsequently, new expansions were planned and organized on regular links and new road systems that would change the structure of the urban poles. An important historical fact, which helps us to interpret the conformation of the city, is the Regulatory Plan for the expansion of August 1883 by the architect Antonio Curri, designer of the unfinished Church of SS. Medici.

Formative phases of urban fabric

At the end of the survey of Rioni Monumentali road fronts and the setting up of the ground floors, a study was carried out on the building fabric. The purpose of this analysis was to elaborate a hypothesis on the formation phases of the urban organism, through the study of the hierarchy of the routes and the related relevance bands. From a summary analysis of the urban fronts and the ground floors, the buildings present a free facade for external facing and access in addition to an opposite front, often the result of aggregations of basic units, which overlooks the area of relevance or on another road.

Each building can be reached through paths along which you can sometimes observe the modularity of the overlooking units.

After the study of the relevant areas, from which the hierarchy of the routes was deduced, the structure of the urban fabric was hypothesized. In the case of Alberobello, five phases of the formation of the urban organism have been reconstructed, starting precisely from those aggregates which, by their conformation, have spontaneous characters. This training certainly precedes the construction of the trulli[1] defined by a planned aggregation law.

Phase 1

In the first phase of formation it's possible to notice how, in both districts, small agglomerations develop a small internal courtyard configuring the idea of the so-called "neighborhood". These buildings appear located on top of the two sides of a little natural depression that forms a canal for the water's collection from which farmers initially obtain supplies. The paths which connect the canal to the buildings are almost straight and longitudinal to the slope. This regularity does not conceal a spontaneous form since the same, classifiable as matrix pathways, may have undergone a rationalization of their structure at the time of tissue implantation.

In this first formative phase, the spontaneous character is distinguished, which turns out to be more evident in Aia Piccola, compared to Rione Monti. In any probability, the formation of Aia Piccola seems to anticipate the others; in fact, it is possible to admit a first trace in the current structure of the city. In addition to the extension along existing paths, new matrix paths are created where new buildings are installed on.

Phase 3

The composition of the historical settlement keeps up developing in a manner which is common to many settlement systems of cities in the nearby. New buildings are built on new routes taken as a building matrix with a series of trulli planning.

Some of these paths are recognizable in the fabric and exhibit a behavior similar to the planting paths, that is, those paths born from the need to "implant" further habitations on paths lined with the main matrix; on the other hand, other buildings, initially set themselves on pre-existing paths and subsequently turned into plant paths, as in the cases of via Monte San Michele and via Monte Pasubio.

Phase 4

In the next step a process of clogging the spaces begins. The development of fabrics leads to the progressive definition of the current blocks, with the consequent closure of some internal paths to courts and with the realization of new connection paths. The latter, as detect Gianfranco Caniggia and Gianluigi Maffei, are to be defined to meet the further need to promote the distance between two system paths. This progressive maturation of the fabric brings about the completion of Aia Piccola and the now complete definition of the cardinal paths of the Rione Monti, with the complete occupation of both fronts facing the paths. In addition, it starts a first batch process increase built in the relevant areas that also clogs the internal areas of the blocks.

Phase 5

The last hypothesized phase records the completion of the blocks of the Rione Monti and Aia Piccola districts, as they currently stand with the exception of some buildings dating back to a later period. The watershade which was the dividing boundary between the two Monumental districts was completely buried and the new Largo Martellotta road was configured. This new route has the features of a matrix route and becomes the road axis of connection with the cities of Locorotondo and Putignano, thus assuming a role of considerable interest. Also in this case, it is a matrix route since the buildings settle there and conclude the blocks by blocking the free spaces next to the shape. The realization of the new matrix path of Largo Martellotta redefines the value of all the paths of the two monumental districts.

Analysis and structure of the aggregate

After defining the hierarchy of the paths, the relationship that is established between the set of aggregates was analyzed. Note that the aggregate is not only the union of several buildings because it also represents the component of the urban organism that inevitably establishes relationships with the systems with which it interacts and establishes scalar relationships. Going to specifically study the individual blocks, it can be seen how trullo buildings develop inside them, often with similar characters to each other.

Also in this case, modularity is a key concept of construction that allows you to read the relevant bands with a development in the facade and in depth consistent with the time phase and the current building type, often defining serial aggregations along the paths. The case study taken into consideration refers to a block in the Rione Monti, in which a planning process is more evident, which includes several characteristics dependent on the block and its position in the district.

Block A1.5

Located between the streets of Monte San Michele, Monte San Gabriele and Duca d'Aosta, the block A1.5 (Fig. 5) presents all three types of path mentioned and you can immediately notice a difference between the buildings in relation to the structure of the path. Starting right from via Monte S. Gabriele, it can be seen that the building follows a trend that is anything but straight, with the buildings that always organize neighborhood areas enclosing themselves in small courtyards. In this aggregation, in some spontaneous places, the built lot stands between 6 and 9 m on the facade with a depth between 8 and 12 m, with the exception of some cases such as the angular variant or as

the buildings that mediate the relationship between two road directions where the size is larger or smaller than the standard range. The plant path, however, present in a small portion on via Duca D'Aosta, presents buildings with fronts between 9 and 10 m and with a depth of 8-9 m, slightly larger than those present on the matrix path, for highlight once again the temporal succession of construction between the two streets. Finally, the connection path, with a particular meaning, connects the matrix path to the plant path by setting the buildings with a front and depth very similar to those of the matrix path, with the exception of some particular variants.

Analysis of the lots in relation to the routes

The next step in the analysis of the aggregation body involved the study of the relationship of the individual lots built on the path belonging to several blocks. The paths in question are via Monte S. Michele and via Monte Sabotino, which enclose block 8 but at the same time connect blocks 5 and 6 on one side and blocks 9 and 11 on the other. By addressing the cases separately, it is possible to understand both the prevailing building modularity and the development over time of the trullo type.

In via Monte S. Michele there are 4 different modules, identified by the letters a, b, c and d, which indicate the width of the building on the facade since it is not possible to study it in depth considering the excessive irregularity of the area of relevance present in the different blocks. As mentioned above, the routes can be placed in Phase III of urban formation, when city planning is in progress as evidenced by the high percentage of module b, in which there is a facade between 6 and 8.5 meters. Modules a and c, on the other hand, occur mainly at the inflection points of the path and at the angular points of the block. In the inflection points, the built lot has an almost trapezoidal shape with a facade of variable width, going from a range between 4 m and 5.5 m (module a) to a range between 9 m and 10.5 m (module c).

In via Monte Sabotino, on the other hand, the modularity varies between the different dimensional ranges of the facade where one of the modules does not prevail. All these buildings are, as mentioned above, on one of the oldest matrix paths in which spontaneous conscience behavior still prevails which originated a building not conditioned by written regulations and rules. Based on the study in via Monte S. Michele, the prevailing module is that b which, however, is not found in a high percentage but is presented in equal measure with the a and c modules which continue to be mainly those buildings that occur in correspondence of a curved section of the route or at the end of the block. Mention should also be made to module d which exceeds the facade size of 11 m and represents that category of buildings built later and in more recent times respecting the dimensional standards typical of the phase in which urban planning took place.

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Conclusions

In conclusion, it can be said that the building typology of the historic core of Arbor Belli, consisting of the elementary cell with focarile and alcove, does not comply with today's housing standards consolidated in this geographical area in our time. Therefore, there must be a form of evolutionary delay of the type, compared to what appears instead in the cities of the same cultural context.

However, this limitation today also represents its critical fortune having become a resource that has determined a form of wealth induced by a growing cultural tourism, intrigued by this primordial form of housing. Positive trend that if, on the one hand it is a comfort to the economy of the community, on the other it poses a question on the role assumed by this part of the building, now no longer considered authentically city because it lacks the main function of each urban organism that is the residence.
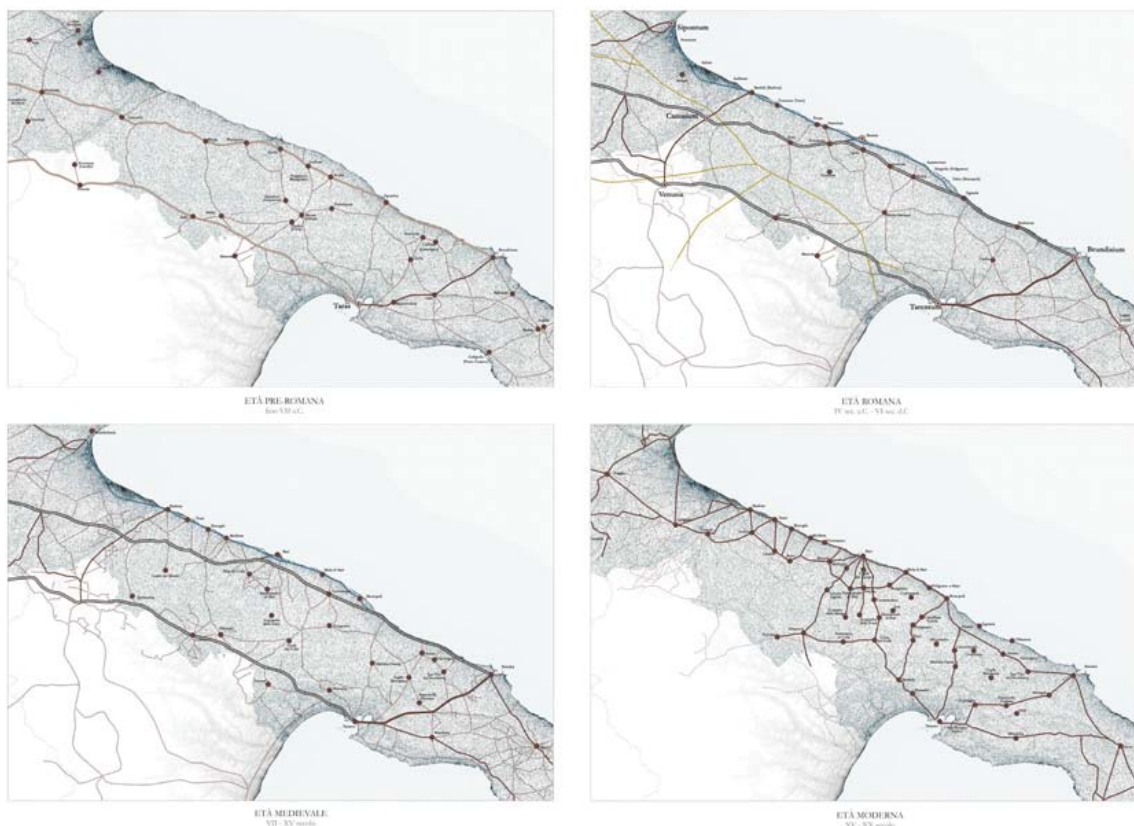
Figure 1. Evolution of the route system in Puglia, Thesis Laboratory/Final Workshop, Dicar, Politecnico di Bari, 2020.
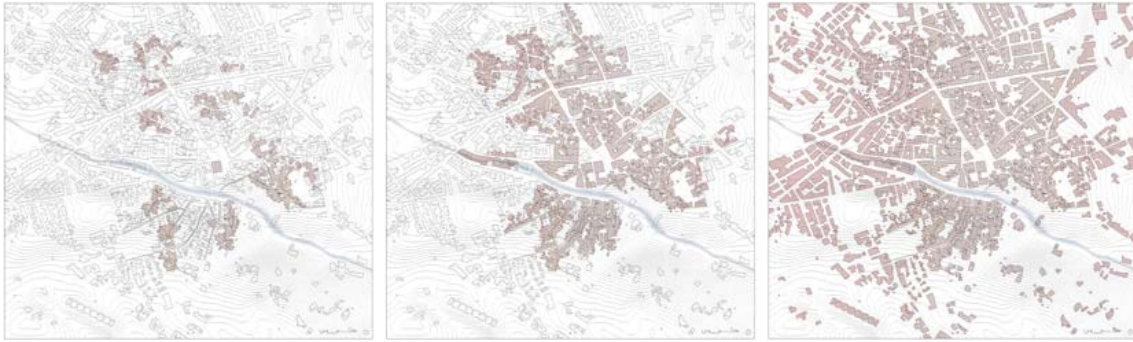
Figure 2. Historical phases of Alberobello, Thesis Laboratory/Final Workshop, Dicar, Politecnico di Bari, 2020.
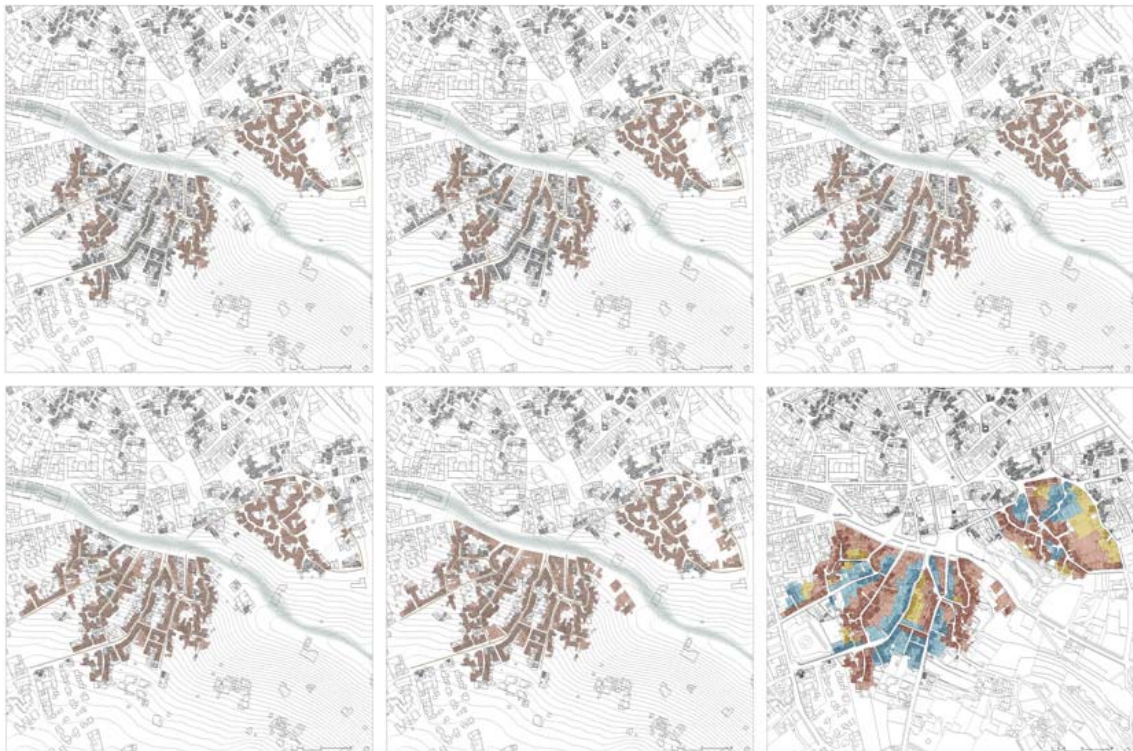
Figure 3. Formative phases of Alberobello and paths hierarchy, Thesis Laboratory/Final Workshop, Dicar, Politecnico di Bari, 2020.

- Matrix path
- Planting path
- Connection path

Figure 4. Analysis of the lot (A 1.5) in relation to the routes, Thesis Laboratory/Final Workshop, Dicar, Politecnico di Bari, 2020.

Footnotes

[1] *Trùllo*, s. m. 'Round shaped stone house e conical roof, typical of the Salento peninsula'

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Metamorphosis of Urban Form in A Historical Nutshell; A Critical Perspective

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Abstract

Urban form is the interface between the social life and the physical environment of the city. Form based practices, cannot be thought without human dimension. It is people and their living styles that shapes the urban character in a place. Urban form as, communizing tool, a unifier; to identify one's reign and land that emphasizing democracy and equity. It also emphasizes 'familiarity' through an urban code; information provided by the intersections of different urban layers or elements in various cases. Form was created for natural reasons and human based reasons. In ancient city forms and formations, the site selection of settlements seems only dependent to the topography, they are not any different than the primordial instinct of human (Rykwert, 1976). However, in time with the increasing number of population and the concern of managing the resources, urban forms started to be shaped by various dynamics. Accordingly, form-based study of this paper includes different paradigms and perspectives appropriate to the time period studied. Ancient urban form, its generation process and the metamorphosis experienced in route to contemporary form and its own dynamics are the two main research fields of the study. By doing this, after the identification of two mentioned phases, a critical review of change process of urban form is focused on. At the very final, reimagination of urban form generation will be discussed for further.

GENESIS OF THE URBAN FORM

Built environment contributes to meet some of our needs. We create this environment with our experiences, and we perceive them. That's why built environment has a symbolic meaning which comes from primitives. According to Jung (1974), symbols are the outcomes of collective possession. So, collective possession has an important role on creating built environment. On the other hand, the built environment observed through the history have faced certain changes. For example, street-structure relations of today's cities could be different in its original time as in the case of Rome and London. With collapse of buildings and tradition of building one top on another, actual heights of ground levels and accordingly topographic structures have changed. Morris calls this process as 'regeneration process of city cells' (Morris, 2013). At this point, it is necessary to elaborate on the relationship between the people, their beliefs and myths, and the urban form shaped by these dynamics to have a better understanding of the metamorphosis of urban form.

Form, Myth and People

Field of psychology offers a broad perspective on the human behavior. Accordingly, people behave through some signs and symbols. According to Sperber (as cited in Rykwert, 1976), symbolism is the same no matter what the origin is, they integrate themselves into a single system within a given individual. It can be understood that the idea of founding a city was the same in all. At this point, human needs to step in. Humans tend to find an answer to the question where they come from, because they want to belong somewhere or to something. That question led to the emergence of rituals when they found ancient cities. For example, they used templum (kind of a template) when they found Rome. In India they used mandala. There are several examples like this, but the point is their meaning. They were abstractions of earth and users of these, the founders are combining their body with the template so that can integrate with the universal order and become god. Before, each family had their own god. In time, they defined their territories and started to create tribes, societies and a city. Thus, gods belonged to larger number of people. " As soon as the families, the phratries, and the tribes had agreed to unite and have the same worship, they immediately founded the city as a sanctuary for this common worship, and thus the foundation of a city was always a religious act " (Fustel de Coulanges, 1864). The foundation of a city was a sacred act. Founders were choosing the site for the new city. This decision was made by gods. Therefore, the decision making, and implementation process was controlled by natural rules; existing flow of life that were assigned to Gods. Namely, the founder of a city was considered as gods (what cannot be explained was from holly sources as it is practiced today) (Rykwert, 1976).

In order to please the gods or not make them angry, there were several rituals. At the genesis, form and physical shape of the city was dependent to rites (Rykwert,1976). Rituals strengthened the bond between the physical world and spiritual that created performative spaces for such activities. Thus, space became an attachment that was resulted in sense of belonging. This need for belonging was tried to be solved by assigning some meanings to the city. City gates, city walls and some components had also sacred meanings. For example, when they plough a ditch called mundus, mouth of hell or mouth of the underworld, they defined in and out of the city according to the soil which goes right or left. Plough was a symbol used as an instrument of fertilization. In other words, ploughed land was representation of a fertile woman. "Also ploughing round the boundary served to define the towns as a legal unit of territory." (Rykwert, 1976). Each city had their founders buried in the center of the city. It was because they believed, if they burry the founder in the center, they can guarantee that the city will continue to live. If new- founders want to mark their territories to be colonized, they visit hero founder and take the clod of earth to throw into mundus, the mouth of hell. As mentioned, rituals are the performances that shaped the physical environment. Assigning meanings to spaces, to routes clarified the role of the places. Thus, first element that is known effective on environment is ritual. In envying to the Classicism in Renaissance, urban form was the major element that wanted to be copied. In the first flesh, people that continues the

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rituals of their ancestors however they lack of 'something' that prevents them to prolong the urban experience of their places.

Places of People

At the very beginning, aggregation of people their position on land was no different than animal tribes (Morris, 2013). It was the conditions of natural environment that controlled human life. And these conditions were dominant over people where people did not have any power until their persistent settlements emerge as a sign of resistance to unknown structure of nature. History of the urban form is studied with what Morris calls 'determinants'; the first group is about nature; topography, climate, location and materials. Topography is effective on future macroform trend and third dimension of the city. Rome is an exception for suitable topography. Climate is related with temperatures and air conditions that affects heights, closeness and movement patterns in the city. Material and construction technologies stand both as a tradition and limitation which is bound to local material and knowledge while remains to stay in human dimension. And the second group includes human intervention; that both includes organic (fortification walls etc.) and planned settlements. It is more complex than natural phenomenon but usually categorized as economic, political, social and religious. Wheatley (1971), states that what exist in the root of urban form is 'ceremonial complex' rather than any other type. That is correlated to 'rituals'. Rituals not only remained as ancient performances but as continuous actions that are not limited to neither paganism nor any other religion. After the shift to Christianity urban form is adopted to new belief system and its requirements. Change occurred in a metamorphosis cycle that experienced in functions. Therefore, city is not re-designed but existing structures are transformed to pragmatic facilities that new belief system requires. Form follows function is transformed after Christianity; functional and symbolic structures of Rome and others were turned to facilities proper for new religious living which brought functions fitted into already existing structures. Namely, the change in urban form basically started with functions and then the structures within time rather than the actual layout. That is why the process referred as metamorphosis which does not strict on the urban form but accepts relatively small changes from very beginning. Changing heights of buildings are quite well examples for that; it is known that Pantheon had an obvious height, an entrance while today it remains in street level which does not create major changes in urban plan.

CONTEMPORARY CITY

"Today, modern writers always consider the choice of a site for a ton in terms of economy, hygiene, traffic problems and facilities...In ancient times they thought in those terms only after having translated them into mythical terms" (Rykwert, 1976). MHYTS are the representatives of archetypes. In the modern world, when it is said common space, the street or square, people directly think their architectural vision, independently from the symbol, which should be the main element that creates them. This may show that things are getting worse, it is now only the visuality that matters. Actually, this is a double-action system. If people cannot reach the self, cannot live it properly they cannot create their own environment, thus they confined to the environment which is imposed. Here, an emphasis is needed to the shift from places of people, which is the harmony between the self and the place, to the disharmony or clash between the self and place itself, or as we call it 'people for places'.

People for Places

"The directing effect of the symbol is thus accomplished through consciousness. If the symbol becomes the center of consciousness and if it is experienced inwardly with an estimate sense of personal identification it becomes the focus of the major energies of the individual. On the other hand, if the individual does not take up the symbol from within, if it does not come to him naturally, but if he/she comes to it merely through the eternal signs by which it is communicated in society, it does not really function as a symbol for him/her." (Barlas, 2006).

That may lead to social neurosis. If an environment is imposed to an individual or a society which they did not create themselves, they won't adjust to the environment. However, the worst part is they won't be aware of it and they will continue to live like it is normal. We are forced to live in monotypic square shaped buildings which does not include the systems of health, security or belonging like in the bird-nest form, comes from primitive's symbolic pattern. It can be one of the reasons for having social depression.

At this point, Richard Sennett (1992) offers an impressive deduction about the rituals, faith and the genesis of the urban form in his book "The Conscience of the Eye". As he discusses, ritual practices had an important role for religious people's understanding of the city. What was protestants looking for? They were looking for their truths in the streets. They were searching an order which will be a solution to their inner-outer discrimination. If they neutralize the city, there won't be any destruction for them which makes them curious. So, they won't face with a chaos which conflicts with their inner order. Because Puritans as a protestant sect were looking for purity. For Puritans the most valuable person was the one who is not keen on his/her pleasures. According to the puritan space ethics, Roman grid turned into something without any reference, value, it was just a system which can be developed infinitely. Thus, people could not understand which space was valuable which was not. This was basically a step for creating unidentified urban spaces (Sennett, 1992). In time with capitalism, modern world view and other factors, the system continued to deteriorate. Urban pieces were seen as a good which can be bought- sold. Urban center lost its meaningful concept and turned into unidentified nodes.

According to Buckhardt, what creates modern society was awakening from the collective possessional illusion. Rykwert (1976) was mentioning that the basic idea of towns was that collective possession. So, it can be said that, with modern system, the meaning behind the idea of towns has vanished. Cities started to form randomly. Thus, individual lost himself, became unaware of the self, cities became unidentified and the whole concept turned into a vicious circle.

We are forced to live in monotypic square shaped buildings which does not include the systems of health, security or belonging like in the bird-nest form, comes from primitive's symbolic pattern. It can be one of the reasons for having social depression.

At this point, Richard Sennett (1992) offers an impressive deduction about the rituals, faith and the genesis of the urban form in his book "The Conscience of the Eye". As he discusses, ritual practices had an important role for religious people's understanding of the city. What was protestants looking for? They were looking for their truths in the streets. They were searching an order which will be a solution to their inner-outer discrimination. If they neutralize the city, there won't be any destruction for them which makes them curious. So, they won't face with a chaos which conflicts with their inner order. Because Puritans as a protestant sect were looking for purity. For Puritans the most valuable person was the one who is not keen on his/her pleasures. According to the puritan space ethics, Roman grid turned into something without any reference, value, it was just a system which can be developed infinitely. Thus, people could not understand which space was valuable which was not. This was basically a step for creating unidentified urban spaces (Sennett, 1992). In time with capitalism, modern world view and other factors, the system continued to deteriorate. Urban pieces were seen as a good which can be bought- sold. Urban center lost its meaningful concept and turned into unidentified nodes.

According to Buckhardt, what creates modern society was awakening from the collective possessional illusion. Rykwert (1976) was mentioning that the basic idea of towns was that collective possession. So, it can be said that, with modern system, the meaning behind the idea of towns has vanished. Cities started to form randomly. Thus, individual lost himself, became unaware of the self, cities became unidentified and the whole concept turned into a vicious circle.

Contemporary Urban Form

As mentioned previously, basing on Sennett's (1992) argument, neutralizing the city may lead to for the unidentified city parts. In ancient cities places were created through the experiences and rituals, so "the self" was the part of places where people live.

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However, throughout time, the population has increased. Inevitably, this led a new organization pattern in cities. As a starting point of the history for contemporary cities, capital accumulation and accompanying dynamics are worth to mention. Accordingly, with the increasing population, stock of products has increased and followingly trade between various settlements has started. Meanwhile, increasing accumulation of capital gave notice about the new structures for economy, society and city (Büyükcivelek, 2017). In 17th century, new developments in the modes of production started to change the labor force into the machine force. So, with the industrial revolution, the production got faster. This paradigm change led to the emergence of new urban structure. As Büyükcivelek (2017) notes that with the industrial revolution, production functions started to be separated from the urban functions, which led to the economic, social and formal changes in the city. Shift from the artisan production to the mass production mode has alienated producers to the products. Meanwhile, there was a migration from rural to urban, which later on led to the density in the city. As Wirth (1938) asserts that after the differentiation has started between urban and rural life, behavior pattern of society has changed into more introverted, alienated and differentiated from one another. This mass population movement created a housing problem in the city. However, the main issue was not the housing problem, rather it was the capitalism which controls the urban space and society, and affects them deeply (Büyükcivelek, 2017). Mentioned problems led the reorganization in the city itself both regarding the needs of society and benefit of capital owners. In this context, there exists two examples of reorganizing the city as metamorphosis and transformation.

In addition to these examples, with the changing dynamics in market mechanism, city form has shaped with the effects of neoliberalism. In this context, Harvey (1989) says that cities are formed with regard to the global scale concerns. So, they could survive in the neoliberal era by maintaining the capital flow. Also, complexity of modern societies and cities, changing urban forms and leading factors (technology, transportation, daily routines etc.) disconnected the form and the function.

Changing organization of labor and work patterns simultaneously changes the urban form. As experienced in industrial revolution, new definitions for work along with new technologies affected the daily life. "The appearance of new technologies leads simultaneously to new ways of organizing production and to new ways of organizing urban space." (Lefebvre, 2014). With modernity, social life and interactions have changed significantly in urban centers. Daily life habits, perception of world and dynamics of social life all experienced grandiose changes. Therefore, change is the key word. It is legible that generation of urban form also shares a similar destiny that motivation behind place making has shifted from needs of people to need of capital. Previous practices reasoning the natural events and human interventions simply because of needs to adopt natural environment is abandoned rather, already produced trends tried to internalize people.

Critical Review of Metamorphosis of Form

Urban form generation is studied by human dimension. Previous practices of place-making are considered human centric. People themselves shaped their environments due to their physical and spiritual needs. Rituals accompanied the journey inherited from space-human relationship. In contemporary conditions, daily life of people is disintegrated from needs but rather, people are tried to be fit in existing conditions. Office blocks of metropolitan areas exemplifies the situation; day by day they become prison of people since lack of harmony with human nature. Rather than, welcoming nature in our produced places, imitation of real nature is hanged up at the walls of closed boxes.

Two well-known examples are used to clarify the difference between contemporary urban form reorganization; Barcelona of Cerda and Paris of Hausmann for their approaches on historical city centers (Büyükcivelek, 2017). Urban form is a tool for collective control by standardization (Mumford, p.327) that is what Hausmann aimed by changing the lay-out pattern (form) of Paris. What Cerda planned for the area got references from existing and tried to combine the old and the new not in geometry but preserved character of place as a metamorphosis process.

The latter excluded the value of the historic center and approached the area as a transformation project. Both urban area changes are not dependent on only form, but form is used as powerful tools to shape the general conditions of their cities. This comparison between two is not putting one another but to clarify the extent of differences metamorphosis and transformation create.

The key word, change is subject to urban morphology studies. A glimpse to the history of urban form there are two major themes related to change; the first one is transformation and the second one is metamorphosis. Urban transformation is referred as initial change on urban environment that enables to recognize previous forms and reduces the connection between the place and 'the self'. In other words, each of the attempts that removes traces of identity are considered in category of transformation. On the other hand, metamorphosis includes relatively smaller changes, similar organizational patterns that emphasizes recognizability, familiarity and legibility. For example, contemporary discoveries on ancient sites approves the idea of recognizability; a roman city is perfectly distinguishable from others. But how? Is it the power of the form or the idea behind that created the form?

Process of transformation creates a new assemblage that requires a new identity and loses past experiences. Therefore, transformed places usually are not preferred since they lack parts from inner self of collective consciousness; it is not result of layered changes but a completely new designed area. In this case, metamorphosis offers a relatively higher connection between the city and 'the self' and parts of inner-self and thus, increases the chance of frequent visits.

RE-IMAGINING URBAN FORM GENERATION

This study aims to understand contemporary urban form generation and problems of harmony between components of urban form. It is not only under consideration of morphology but also, psychological and social dimensions have crucial roles. That is the main motivation that the study bases ancient generation even if it seems irrelevant, the connection is the human centric approach and the harmony of human's inner and outer self which occurs naturally, unintentionally and primordially. Thus, here the main discourse is that form is the reflection of the inner-outer duality on space. Accordingly, conflict between them, an unbalanced situation is the first step of emergent problems between human and its environment. No doubt, contemporary urban form organization will require something else than the rituals shaped by religion; however, the main concern that people look for will be the same, which is 'their self'. Namely, to overcome this concern, roots are to be studied to imagine a better future for cities and simply for people.
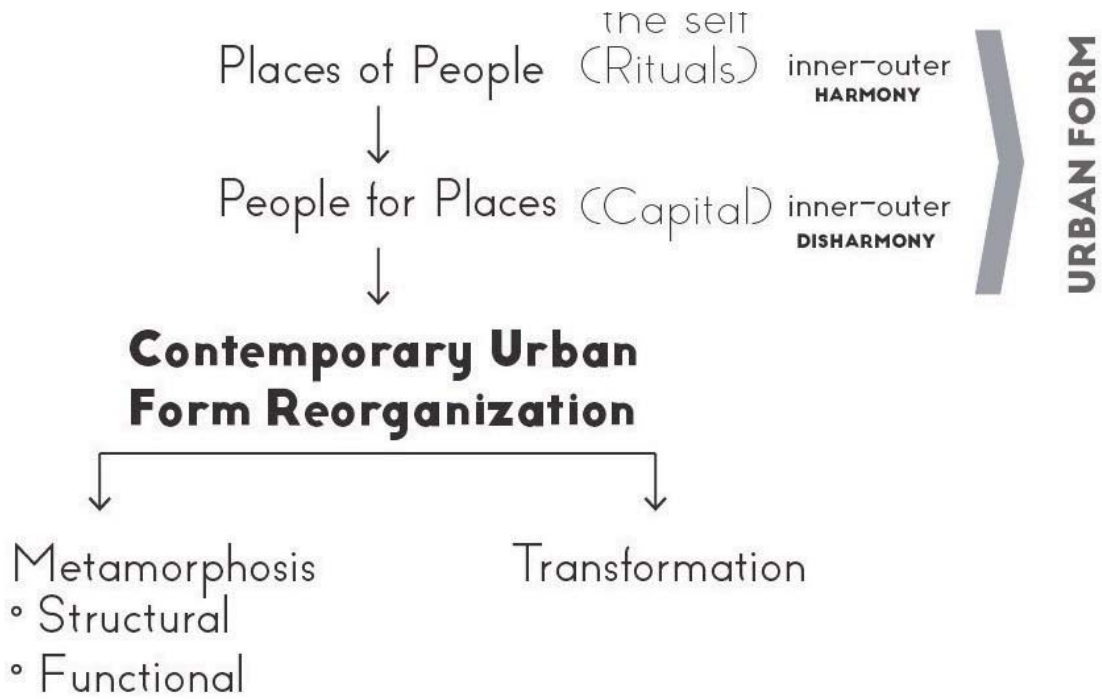
Figure 1. Conceptual Scheme of the Flow.
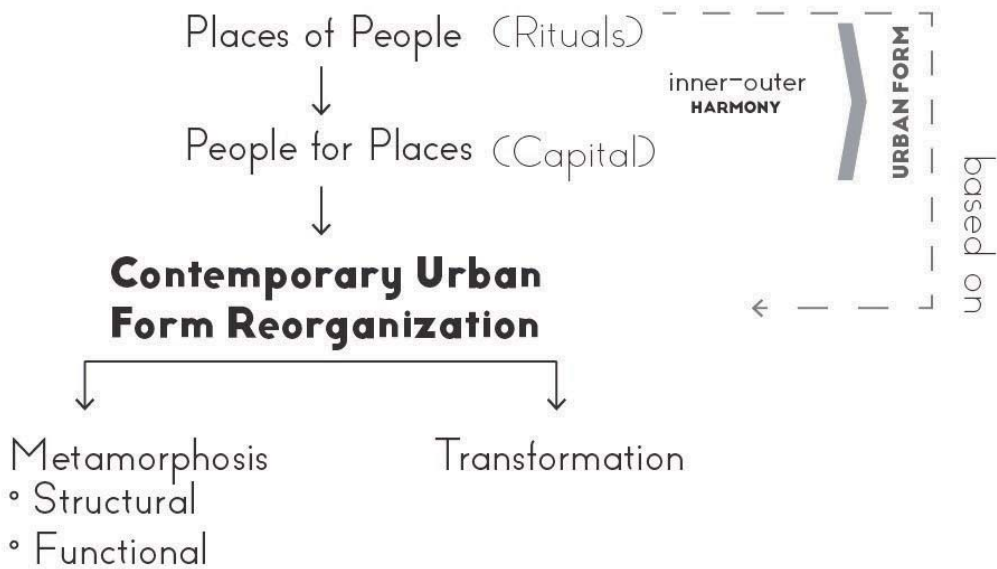
Figure 2. New Conceptual Scheme of Urban Form Generation

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Transformation processes and the teaching of Urban Form Morphological legacies and Design tools

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Keywords: *crisis, vacancies, waiting lands, displacement, rearrangement.*

Abstract

The teaching of urban form, since its inception, has been widely affected by the condition of existence of the current city. To a deeper investigation, it becomes explicit how Urban Morphology and Building Typology was progressively established as a new disciplinary field in order to fulfill the requirement of a knowledge framework- regarding the conception, construction and transformation of the city itself. This necessity suddenly manifests itself when facing the urge of city rehabilitation and/or conversion after its falling into crisis, due to damages or simply because not anymore responding to societal aspirations. This is even more evident as we analyze the urban history of the last century, characterized by a considerable number of destabilizing traumatic events, such as wars and socio-economic turmoil, heavily affecting its essence as well as its material coherence. This paper aims to demonstrate how transformative processes are responsible of generating a continuous loop, whose phenomenological appearance the study of form has to translate into a discrete sequence of phases to classify and understood, for the benefit of the design teaching. The modality of this translation is furthermore responsible of the principles, methods, instruments and languages upon which the discipline is grounded and its own legacy established.

The present condition of Urban Morphology

To reflect on methodological and content wise innovation in the teaching of Urban Morphology and Building Typology implies to ask ourselves through which historical condition we are expected to guide our students nowadays. The situation we are currently experiencing is, in that respect, a critical one. Undoubtedly, if over the last decade we have been witnessing the decline of the global capitalism, dropped down since the financial bankruptcy occurred as a consequence of the *sub-prime* scandal in 2007, pessimism is increasing in a period just preliminarily affected by the drama of coronavirus on a worldwide perspective, accompanied by the initial perception of its forecasting economic effects.

This consideration bring us to reconsider precedents. Limiting ourselves to reflect on what had been happening over the last century, we will find evidences of the fact that Urban Morphology, intended as a strictly ruled discipline, has been appointed by the necessity to react to a period of crisis, leading the expectation to overcame it. Of course, what considerably changes in the subject matter is the nature of the crisis itself (whether it is natural and/or caused by human being decisions) and the different interpretation of it given by the humans into different socio-historical constrains.

This observation should not be surprising, since any crisis urges transformation, whether it preliminary affects tangible or intangible aspects of the existing society and, consequently, it claims for a coherent update of the artificial environment, which hosts the community, to new expectations and the related requirements. Therefore, innovation forces us to retrospectively find in the far-reaching and recent past evidences regarding the necessity of transformation of the existing natural and/or artificial condition, and which beneficial effects we can derive for the near future of our discipline.

On transformation processes

To further develop this challenging approach we do preliminarily have to discuss how transformation should to be intended in general and, more specifically, what it ought to be with respect to the disciplinary field of Urban Morphology and Building typology. Of course, this would necessarily imply to critically reflect on its constituting language, once again taking into consideration the differences characterizing the distinctive schools and the related member interpretations.

The transformation (from the ancient Greek *metabolole*, μεταβολή, derived from the verb μεταβάλλω, meaning «to through beyond») is a process of constantly changing position. It therefore implies a mutual relation between a "body", whether it is animated (a living one) or not (a thing subject to movement), and the "environment" it interferes with (whether it is natural and/or artificial) (Marzot, 2017). As such, transformation almost simultaneously affects as well the specific modality of the encounter/interference as the implied entities.

Consequently, it becomes evident the inherent complexity of any transformative process, since it is both the premise of any change (always occurring at the level of the mutual state of coexistence of the aforementioned entities) and its result. In other terms, if transformation generates the change, the change extend the transformation itself. Within a transformative process, therefore, change follows change, according to an endless sequence of "bifurcations" (Meillassoux, 2007). Once one assumes that any transformation is immersed within the continuity of the phenomenological appearance of the change itself, it can be imagined as a potentially infinite flow of changes due to mutual interference between entities.

If we do accept to live in a permanent condition of transformation, intended as a mutual interference between us and our hosting environment, we are however entitled to perceive a condition of stability every time we do experience the same modality of interference. In that perspective, stability stays as a specific modality of appearance of the transformation in the form of a change repetition: we mutually relate in the same way. This assumption is fundamental within any anthropological process: the continuously changing interplay between the living body and its specific environment (the transformative process) can ultimately reach such a level, which is assumed as worthy to be

repeated for the presumed benefit of the mutually implied entities (Marzot, 2017).

We do exercise any time we do deliberately repeat a certain state, or change, of the transformative process, presuming to be aware of its consequences, assumed as valuable to both the implied entities. The repetition is therefore responsible of the deriving unity among the aforementioned entities: unity always refers to the mutual relation. Even more, unity stays for a stable (ex) change between entities.

Crisis occurs at any time the stability conventionally shared in relation to a mutual changing condition is approaching to an end, because of one of the implied entities. Consequently, we can witness a change happening in the "chain of changes" through which we do experience transformation, because of the "body" or the "environment" inability/impossibility/unavailability to behave as previously expected. As a consequence, crisis interrupts the conventional stability of the (inter) change, being responsible of the unity (referred to the reciprocal affection) progressive or sudden lost.

Urban Morphology and transformation processes

The pedagogical method followed by Urban Morphology and Building Typology implies the disassembling (analysis) and reassembling (project) of its own object of investigation, whatever it is its own level of complexity, in order to generate a self-consistent disciplinary body of knowledge instrumental to the design activity. Through the repetition of the whole cycle, the student, via trials and errors, therefore acquires a critical and proactive ability, i.e. a technique to empower his/her own imagination, progressively comprehending the corresponding subject matter underlying mechanism of functioning.

During the early stages of his/her education, the student behaves as a kid, who disassembles any object under observation, to understand its hidden set of rules, then performing a seminal process of appropriation. Due to lacking of experience as well as limits of knowledge, after the dismembering phase he/she is not able any more to reassemble the obtained features, generating absurd if not hilarious results. Paradoxically, due to this structural inability, unconsciously he/she is expressing an almost absolute level of creativity, since the pursued process is relieved of any prejudicial conditioning.

On the contrary, becoming more mature, the student tends to behave as an adult. Through the sheer repetition of the exercise, he/she shows an almost completely secure self-confidence in handling the dissection/reconstruction process, succeeding in completing the assigned commitment. However, being satisfied and gratified by the achieved success, he/she is not aware of having performed a protocol of normalization, which ultimately results in a minimal lever of creativity, having achieved a full control of the object functioning.

We should not underestimate the appearance of an analogical relation between the student's exercise, and the corresponding pedagogical method, on one side, and the socio-historical conditions, which have induced the emergence of a new disciplinary field, on the other. As we already came across in the premise, reasons of it ought to be traced back to the urge for reconstruction after major damages occurred to the existing city, following traumatic events, which have determined its crisis.

This assumption is of a capital importance, since it offers us the possibility to state that the education to the architecture of the city grounded on disassembling and recomposing its constituting elements simulates, through repetition, the condition of existence of any anthropic space in its attempt to create a suitable world for living, inducing the transformation of the existing condition. This is why to site-specific historical approach do correspond symmetrically different interpretations of the transformation process itself.

Since transformation generates the change (i.e. the interplay between the "body" and the "environment"), then enabling the technique, which is the ability apprehended during the transformative process itself, the project, which is also a problem to resolve (from the ancient Greek *probállō*, προβ λλω "to throw forward") comes out of it as the most challenging result to further develop. Since technique is therefore responsible for the project/problem statement, any time it reveals itself, then technique symmetrically manifests its "conjunctive" power. On the opposite, when the project/problem statement has to be resolved (from the ancient Latin verb *resolvere*, "to release"), then tech-

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nique shows its "disjunctive" power as well. This circularity is fundamental and give us the possibility to understand the variety of approaches to the study as well as to the design of urban form.

Rehabilitating the European city after World War II

When looking backward to the dramatic pictures of London's Saint Paul area, Rotterdam's Coolsingel, Berlin's Kulturforum, among others, after the destruction of bombing and the removal of the remaining ruins, if not to the Tokyo bay, anyone is suddenly overwhelmed by an all-encompassing suspended atmosphere. The perception of estrangement, displacement, isolation, loneliness and, even further, incompleteness generated by the few survived vacant buildings and waiting lands, once deprived of their own originating whole, induces panic and a widespread sentiment of indeterminacy. The lost urban unity, which was responsible of the previously existing individual urban block and monumental architecture meaningfulness, embarrassing asks for rehabilitation. Modernity, at that time, has already completed its own pioneering apprentice and therefore claims for an immediate assumption of responsibility for the reconstructing phase. However, looking retrospectively to its own more compelling Manifestoes, it reveals a quite ambiguous relation to the war's tribute as well as effects. Le Corbusier's *Ville Radieuse* (1933) counteracts the Haussmannian dense urban tissue of Paris by replacing it with an indefinite green field, imagined as a displacing new kind of urban soil, discontinuously punctuated by the sheer emergence of isolated vertical slabs. Later on, to find scientific arguments to support his thesis, in continuity with Cerda's *Teoria general de la urbanització* (1867), he will be explaining the dissolution of the urban block to give rise to the architecture of "the machine age" (Le Corbusier, 1946) in order to guarantee the "sanitization" of the *llot insalubre*. Ludwig Hilbersheimer grafts its own sample of the Großstadt in the *Friedrichstad highrise city* (1928) to evoke the necessity to extract and abstract the new architecture from the resolution of the old one, then deprived of any historical value. The striking juxtaposition of the two, similarly to Le Corbusier's approach, is implicitly evoking a sheer analogical relation between industrialization process and naturalization ones (FIG. 1). The reduction of the "historical" to the "ideal" is assimilated to a ruining condition. In both cases, what clearly emerges is the seductive power of the palingenesis prompted by the war itself, which seems to "represent" the industrial process latent ambition. The lost unity, supporting bourgeois conventionality, should therefore be replaces by a new "neutrality", mimicking the natural one. When leaving the propaganda of Manifestoes, in practice the European city reconstruction follows completely different strategies, which are surprisingly taking into account what was already there as a source of inspiration. However, approaching the rehabilitation process, three concurrent strategies outstand among others. The reconstruction of the historic center of Warsaw opts for a strategy "as it was where it was", completing the scarce remaining traces, also taking into account some cadastral maps and XVII century aerial view of the city by the Italian painter Bernardo Bellotto. This decision, although legitimate in the conscious attempt to get rid of the recent past and its visible scars, on the contrary is based on the unconscious removal of the present condition, upon which should be grounded any design prospection, and from which solely any knowledge regarding the past and prevision towards the future is ultimately possible. In Dresden, the political decision to maintain the Cathedral of the Holy Trinity in a persisting state of ruins, as a living witness of the war outrages committed by the bourgeois enemy, on the opposite confirms a displacing condition of incompleteness as an even more dramatic premonition of the near coming widespread of the modern Nihilism. The shopping center in Lijnbaan, at Rotterdam, by Van Den Broek&Bakema (1951-1953) develops an approach, which is destined to become a new paradigm in urban reconstruction strategies. The architects, in fact, recognize the urban block can still play a crucial role in it. In fact it guarantee a practical and easy negotiable solution between land use management, under the control of the public administration (which rent out its stocks corresponding by percentages to what originally owned by the privates), and the necessity of updating the living standard of both dwelling and working spaces. The existing street pattern capacity can, therefore, be tested

and verified in the light of the new achievements in the field of modern architecture and building construction, supporting the emerging entrepreneurship dynamicity, pushing the former limits to an extreme.

The post-industrial city relocation process

Since the second half of the '70, the European city had been witnessing a second widespread crisis, prompter by the increasing dismissal of former industrial areas, under a systematic process of relocation in order to adjust themselves to the changing size of the international market and the consequent urge for new infrastructural investments. Because of that, many strategic areas, positioned in the close vicinity of city centers, become vacant and release unexpressed energies and unpredictable potential at the mercy of urban concentration's destiny. In that perspective, the *Masterplan for the Olympic Village* in Barcelona by MBM Architects (1980-92), for the ZAC *Bercy* in Paris by Jean Pierre Buffi (1985-2008), and Hans Kollhoff & Arthur Ovaska's *Wohnpark am Berlin Museum*, Block 33 in Berlin-Kreuzberg for the IBA program (1984-1986), among others, seem to offer the opportunity to verify the pioneering urban prototype already envisioned in Rotterdam on a larger as well as systematic scale. Of course, it implies to take into account the site-specific limitations, which introduce necessary variations on the shared approach, assuming the dialectical relation between the street pattern, critically inherited from the tradition of the European city, and the urge for a radical revision of building type solutions. The achieved results confirm the existence of a common and solid cultural background, and the consequent profusion of dedicated literature in favor of a truly international audience, boosting the leading disciplinary role of Urban Morphology ad Building Typology and confirming the existence of a European legacy. However, one has to recognize that this very successful trend has produced a generalized normalization of the design practice as such. Its unquestionable evidence, compared to the post WW2 reconstruction phase, is not confirmed by practices, but on the contrary by the uncontrolled proliferation of "Retroactive Manifestoes", quoting a successful urban essay by Rem Koolhaas (Koolhaas, 1978). In fact, almost simultaneously to the consolidation of the European way to the modern society crisis, radicalism starts contesting the soliloquy of the "Single Thought". Neo-Avant-gardes, in that respect, coexist with a complete revaluation of some past pioneering surprising extra-disciplinary formulations, together with attempts to contrast the morpho-typological homogenization, critically reflecting on urban history to take into account site specific constrains and limitation. Pierre Patte's fictional *Plan of Paris for Louis XV's monument* (1765) challenges the designers to figure out the subversive power latent in clustering imagined solutions and locations for a *place royale*, independently from any historical premise, envisioning the precognition of an *ante-litteram* network city (FIG.2). Oswald Mathias Ungers, Rem Koolhaas, Hans Kollhoff, Peter Reimann and Artur Ovaska's *The city in the city. Berlin: a green archipelago* give us the chance to imagine how shrinking phenomena generate a transformative process according to which previously existing urban feature undergoes an ontological transfer. In fact, they become mutually isolated fragments, expression of ideal formal identity, then stimulating cross-references and far-reaching creative design associations. *Il Campo Marzio dell'Antica Roma* by Giovan Battista Piranesi (1762), together with Aldo Rossi's *La città analoga* (1976) and Hans Kollhoff's *City of composite presence* (1978), confirm the ability of collage technique to perform the disjunctive power of any stable and unite configuration, allusive to conventional system, condemning the corresponding relation to ultimate resolution. Consequently, all fragments precipitate into a state of coexistence and indeterminacy, to the benefit of unexpected possibilities, obvious premonitions of the post-modernity destiny. *The Diocletian Fortress under transformation* in Split, from Robert Adam (1764); The anonymous XVIII century engraving of *Arles' roman amphitheater (during medieval time)*; JM Gandy's surprisingly imaginative *Aerial cutaway view of Soane's Bank of England* (1830), reducing very famous conventional building to a landscape of ruins, suspended in their own deliberate incompleteness, all evoke the overwhelming creative power of transformation to generate change and, beyond that, unlimited design possibilities through their own implicit techniques. Arata Isozaki's *Incubation process* (1962) and

Superstudio's *Monumento continuo* (1969) for Rome's Coliseum, finding archeological evidences and typological analysis support in many recent and far-reaching substrata (Lanciani, 1894-1901; Caniggia and Maffei, 2017), claim the design always results from the never-ending provocation made possible by concretely and mentally evoking the past ruins, bringing them forward the present time, to help us imagine the near future. Last, but not least, Giovanni Antonio Canal's masterpiece *Capriccio con edifici palladiani* (1756-1759) deserves a special attention in its unrevealed capacity to make us awake of the subtle rhetoric underling any outspoken claim in favor of the vacancy interpreted as a gap to be filled by conservation strategies. The design challenge, therefore, appears as an enigmatic presence to be resolved; a condition of displacement to take care of, being aware of its unavoidable recidivity; a subtle combination of unconscious expectations, conscious values and unlimited desires; a dancing relation between corporeal interaction and intellectual pleasure, contingency and transcendence. Architecture belongs to the all-encompassing domain of transformation and not to the narrow one governed by the oppositional categories of the Rationale. To rediscover this, we need to lose control over the real to claim it back, and vice versa, according to an endless loop.

The Network city and the deterritorialization process

Causes of relocation processes prompter by post-industrial society where not questioned at all until it was clear to anyone the emergence and subsequent consolidation of a new generation urban configuration, taking advantage of the multimodal infrastructural investments made possible in order to support a value chain progressively extended to a worldwide perspective. Potentially ubiquitous and dynamically wide spreading in order to exploit the maximum level of opportunity possible, the Network city was clustering all together those global hubs acting as attractors of energy flows- materials as well as immaterial. By forcing people, finance, services, goods and natural resources to constantly move, for the benefit of the generated hyper-structure itself, redistributing them accordingly to the changing necessity of its complex and intricate logistic, its mostly congested hot spots increasingly become the inhabitable repositories to guarantee energy continuous storage, relocation and consumption. The network city's performance therefore requires and imposes over the continuous pre-existing territorial extension a systematic process of displacement, division, estrangement, isolation, of the most profitable parts of it, putting into crisis its framework internal unity, articulation and achieved stability. If fragmentation is the immediate symptom of any unitary system fall into crisis, in this case what ultimately result relieved from any original constrain has to be immediately captured within the network system of relation cage, while unprofitable features are abandoned and then doomed to an edging condition. The Network City affects all the global surface, discriminating opportunities according to its sheer and severe inner logic. In that respect, OMA's *Euralille* Masterplan (1989-) in Lille, France has fueled, because of the development of the high-speed train system, the cluster wise arrangement of the most important capital city of the north Europe, deactivating the conventional relations within their own territory. Ove Arup's *Channel Tunnel Rail Link* (2003-07) and Stratford Centre station (2007-) in conjunction with KCAP's *London Olympic Park* Masterplan (2007-10) in the Greater London Area, England, has generated an unpredictable new urban conurbation, capable of connecting the all Thames estuary zone to the Gran Paris Metropolitan Area. In such a way, it was giving existent, after almost two century, to Napoleon's unconceivable vision to cross over national borders. The Randstad in The Netherlands, since the '60 onward, succeeded to give increasing imagination to an urban system potentially capable of competing with the most important European city, at the cost of dramatically altering the existing territorial relation, without achieving any administrative recognition. Last, but not least, *Öresund* City, after the opening of the homonymous bridge in 2000, in synergy with Klas Tham's Masterplan of BO 01, in Malmö, Sweden (2001-), has guaranteed the most impressive daily migration- of people, finance, natural resources, services and goods- ever happened within the Old Continent- almost profiting of the structural imbalance between the richer Denmark and the poorer Scania (FIG.3). If the hubris (from the ancient Greek υβρις, hýbris), with the significance of "arrogance"

and "excess", presumes the will to exceed any given limit, whatever its nature is, being generated by the disjunctive power of transformative techniques, which manifest themselves through the "resolution" of a previously existing coherent structure (or system of relation among its constituting components), Bigness (Koolhaas, 1995) clearly expresses its conjunctive counterpart. In fact Bigness requires, as its unavoidable premise, the delirious "wandering" of the component part from its constituting whole, reducing it to an isolated (from the ancient Latin *sŏlūtus*, meaning "released") fragment. Therefore, the ontological status of the fragment is that of "absoluteness", since it is deprived of any bond, then corresponding to a material atom (from the ancient Greek àtomos, ⟨τομος, meaning «indivisible», composite of ⟨- ,alpha privative, and témnein, τέμνειν, «to cut»). In such a condition, the hubris becomes the *substratum* of the Bigness, its implicit valueless object of reclamation. The fragment incremental value is therefore emerging by the conjunctive power of the available transformation techniques (recompose, recollect, rearrange, etc..) in compliance with unpredictable experimental strategies. Again, the "descending" chain of changes, which generates the fragment as well as the "ascending" one, which is leading to its possible recollection to achieve a new sort of unity is never autonomous, or self-responsible of its own rule, but always strictly prescribed by the unstable Network City horizon, confirming its unquestionable and unpredictable sovereignty (Marzot, 2018).

Crisis of globalization and the shrinking city phenomenon

The crisis of the financial capitalism, forecasted by the *sub-prime* mortgage scandal in 2007, has increasingly relieved those building stocks previously "captured" by the new urban configuration infrastructural network, whether they were part of previously well-established territorial unity or vacant fragments/waiting lands inherited from former post-industrial relocations (Cavallo, Komossa, Marzot, Berghauser Pont and Kuiper, 2014). Because of that, they have been progressively precipitated into an astonishing as well as enduring condition of incompleteness, remaining suspended in between a "not anymore", the clustered civilization process fueled by the worldwide market, and a "not yet", the expected community to be (Agamben, 2001). Dropped down into an unprecedented scenario, they were potentially condemned to rest in an almost eternal standstill, simply to save the related financial statement expectations, waiting for fully reestablished originating conditions. However, the corresponding "state of exception" would ultimately admits the "meanwhile uses" of those vacancies, since they were not putting into discussion the existing ownership system (Agamben, 2003). On the contrary, they would eventually operate in favor of the existing conditions, indirectly promoting them, free of any additional charge for the property, since the building stock was offered temporarily at no lease, if not to cover basic expenses. In such a way, allowing its use by all those, mostly associations or private partnership, with a limited investment capacity, demanding vacancies for social innovation and cultural purposes, would eventually guarantee an informal facility management and maintenance of the building stock, not obstructing the legitimate aspiration for its major transformation for the time being. Those opportunities had been also encouraged by the local municipalities, happily supporting experiences of bottom-up participation capable to integrate successfully the public service deficiencies, due to the administration debt limitation imposed, in the meantime, by the European Community. However, many of those experimental strategies were progressively envisaging the possibility to regenerate vacancies and waiting lands, instrumentally using them to explore the coming into existence of new form of community, self-generating economy, sociality, counterculture and radical politics as well, well beyond the initial motivations (Bonetti, Roversi Monaco and Marzot, 2017). The project *Estonoesunsolar*, by Gravalos&Di Monte in Saragozza, Spain (2010-17) took the opportunity, thanks to the local administration financial support to retain unemployment rate after the 2007 crisis, to turn an art festival into an "acupuncture strategy" affecting a wide network of plot vacancies, letting the citizenship to start imagining a different urbanity for the time being. Eva de Klerk's NDSM shipbuilding warehouse redevelopment (2000-) in Amster-

dam north, The Netherlands, was taking the chance of the building marked drop down, and the unexpected availability of unused ex-industrial archeological evidences, such as the *Kromhouthal* and the *IJ-Hallen* (FIG. 4), to insert ephemeral apparats to transform the former into temporary exhibition spaces and market hall. The whole operation was giving rise to the progressive emergence of a widespread urban staging strategy, further on used by the real estate system to start an in depth renewal project taking advantage from the already successful trials. ZUS's *Luchtsingel* in Rotterdam, the Netherlands (2012 onwards) was transforming an abandoned office building of the '50 into a creative hub, encompassing a wide range of design services, offering them a synergetic environment, responsible of a suspended pedestrian infrastructure crowdfunding initiative, aspiring to stitch incrementally additional vacancies and waiting lands for the benefitting of the local neighborhoods. The *ex-freight Ravone* regeneration process (2012-) in Bologna, Italy, by PERFORMA A+U is responsible to have imagined, adopted and finally prototyped, for the first time within the national Planning history, the adaptive reuse of existing warehouses, left abandoned after the original industrial activity relocation. From 2019 onward, the launch of DumBO (Bologna's Multifunctional Urban District), is testing the "meanwhile use" strategy to envision a wide range of building configuration to be migrated, when successful, within the Implementation Plan, under development, as an experimental bottom-up value chain trigger (Marzot, 2019). Those proposals, among others, witness the capacity of regeneration processes to simulate the coming into existence of a real community, encouraging active participation of wide strata of the civil society to become directly responsible of the urban environment. This is happening out of any nostalgia towards the past as well as any utopist vision towards the future, being all explorations radically embedded within the existential duration of the present time.

The Coronavirus effect and consequences

This paper has been revised in the due course of a dramatic pandemic effect, to which every nation is differently reacting. Notwithstanding this, a seminal speculation on possible common effects and consequences is helpful in the light of the subject matter under discussion here. In fact, the virus widespread has generated a widely accepted lock down and consequent frontier closure, established by individual nation. This clearly stays for an indubitable claim for State sovereignty affirmation in opposition to a still alive overwhelming power aspiration, exercised by globalization processes. Among the immediate results, one records the sudden drop down of the building market, over the last years heavily affected, on a worldwide perspective, by massive touristic flows, which are currently completely frozen. In addition, there is an increasing expectation of a virus recrudescence just after summer time and, beyond them, it is still perceived the risk caused by people assemblage even in the case of a partial unlock, urgently asked by entrepreneurs to avoid an even worst social and economic crisis, following the sanitary one. In the light of this picture, the related building stock will remain almost completely vacant for the time being. We also have to imagine a probable economic deflection, due to the overabundance of the supply, originally doped by global imbalance. Consequently, part of the mentioned stock will progressively move in favor of a rental demand, still remained unsatisfied from the precedent period, due to the unbearable competition with the one generated by the mentioned touristic flow, taking into consideration the not-existence of any public policy in support of it. However, assuming a realistic increasing impoverishment of families, a consistent part of the stock will remain vacant. To avoid an even more dramatic deflection, to mobilize vacancies will require an institutional role to come into play. Focusing on the Italian situation, for instance, we have to consider that all the Universities had been suffering a lot from the building market shrinking due to the Airbnb competition (Gainsforth, 2020), being the city as a whole explicitly intended as a Campus. Assuming the current transformation, Universities, or their dedicated agencies, could start claiming a mediation role to mobilize the suffering stock, also comprising the accommodation capacity, using the same strategy adopted by futures in the commodity market. By guaranteeing to the ownership system a negotiated income for a predetermined time (not necessarily continuous), in compliance with the performance of a cer-

tain standard, simultaneously they would immediately boost the economy, also helping student family to face the crisis, preserving the expected educational level. The scattered hotel strategy could eventually become a repeatable one, increasingly involving intermediate institutional parties (the same municipalities among others), performing a temporary *social dumping* for the beneficial of the all system. With the financial support of banks, the institutional debt could be guaranteed by the emission of social bonds, in favor of private investors, and/or seeking help to specialized ethic funds. This mechanism, of course, would eventually require a strong and shared political decision, to fertilize as much as possible the all-societal strata.

Some final considerations

During a period of persistent crisis, vacant buildings and waiting lands multiply. The building stock, independently from its former quality, is then doomed to lose its own value, not solely economic. This justifies because it is finally relieved from its "community bond", and the related responsibilities, not being anymore instrumental to give material evidence to the previously existing society expectations. Remaining temporarily suspended into a new ontological status of incompleteness/displacement/isolation/estrangement/disorientation, among others, this stock is destined to become, literally as well as metaphorically, a "landscape of ruins". To rescue it back from the unavoidable condition of decline into which it precipitates, a regeneration process is then required. Its success depends upon its capacity to involve as many as possible stakeholders, not just to share the related responsibilities, but also mostly to promote a corresponding fertilization process. In that respect, regeneration simultaneously implies both the urban and the human condition, where the two are continuously turning into each other from being the proponent and the beneficiary as well, encompassing all the societal aspects. In that perspective, to inhabit is a heuristic and experimental strategy, aiming at exploring unsuspected possibilities, in case of success, fully to exploit. Value, in the due course of the process, eventually comes out from the changing conditions prompted by the transformation itself, and manifests as an emerging ability commonly shared among those involved in the process as a generating "service" to acquire self-confidence, awareness and mutual recognition (Agamben, 2012). Those abilities are therefore techniques, which enable the coming into existence of a community, whose members will claim the right to make an instrumental use of them to develop, growth and widespread. The possible occurrence of all that will stays as the confirmation of new value possess to reproduce. Architecture, in this respect, will have completed its originating mission and role, leaving room and space to the sheer repletion anew of the building chain purposes.
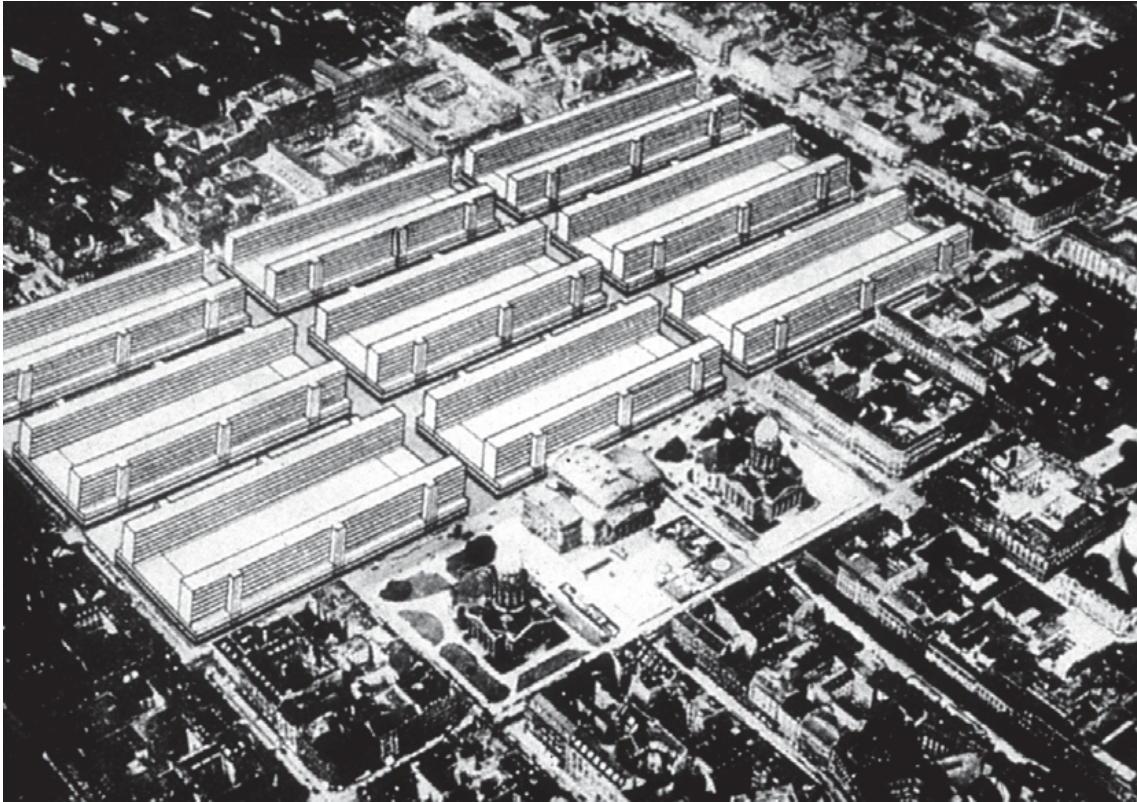
Figure 1. Ludwig Hilbersheimer, Friedrichstad highrise city, Berlin, 1928.

Figure 2. Pierre Patte, Plan of Paris for Louis XV's monument, 1765.

URBAN SUBSTRATA | Morphological legacies
& and
CITY REGENERATION | design tools
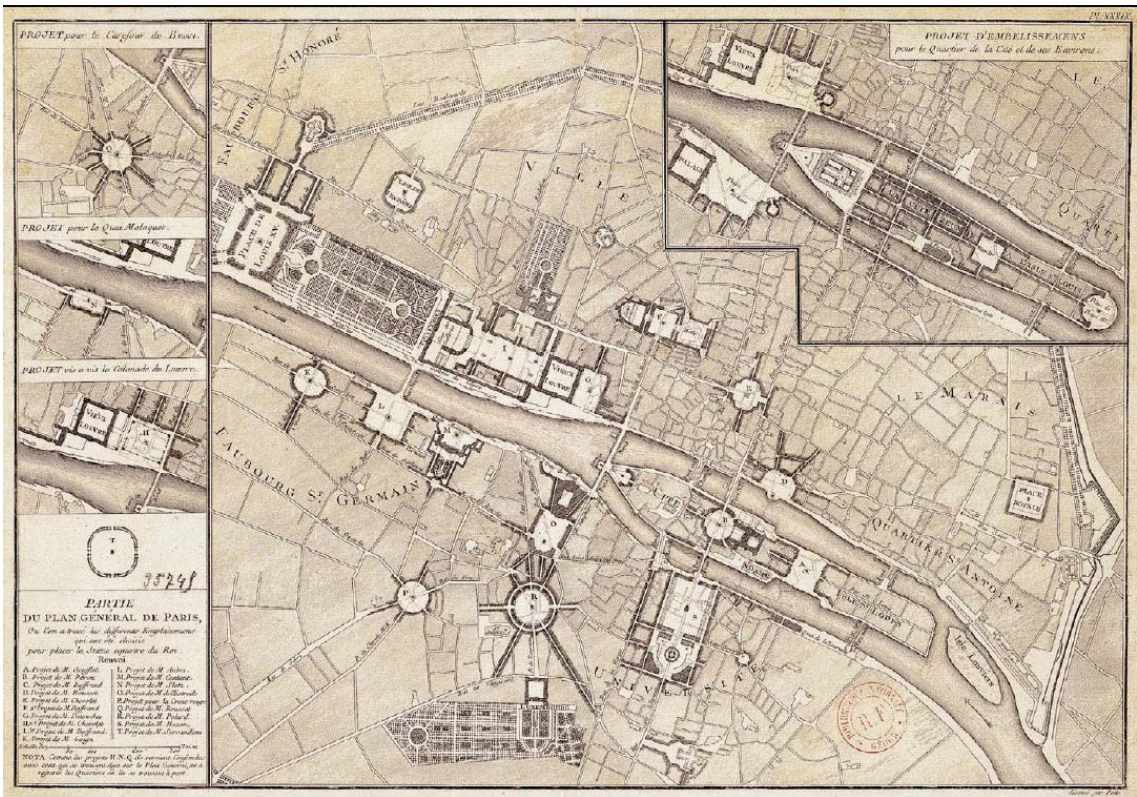
Figure 3. Öresund City in synergy with Klas Tham's Masterplan of BO 01, Malmö, Sweden .

Figure 4. Eva de Klerk, NDSM shipbuilding warehouse redevelopment, Amsterdam north, The Netherlands, 2000 onwards.

Caption

Figure 1 - Ludwig Hilbersheimer, Friedrichstad highrise city, Berlin, 1928. The scientific model of the Großstadt suddenly precipitates into Berlin's Mitte, evoking its own reduction to a fragmented sample. As such, it challenges the existing bourgeois city, suggesting the necessity to extract and abstract the new architecture from the resolution of the old one, deprived of any conventional value. The "historical" is then assimilated to the "ideal".

Figure 2 - Pierre Patte, Plan of Paris for Louis XV's monument, 1765. A fictional transformation of Paris clusters proposed solutions and locations for a place royale as answers to an official call by the Academy, acting as an ante-litteram "Retroactive Manifesto". The disjunctive power of generative techniques challenges the designer's imagination to figure out unexpected possibilities by subverting the existing conditions.

Figure 3 - Öresund City, after the opening of the homonymous bridge in 2000, in synergy with Klas Tham's Masterplan of BO 01, Malmö, Sweden (2001-). An astonishing transnational multimodal network has guaranteed the most impressive daily migration- of people, finance, natural resources, services and goods- ever appeared in the Old Continent, "capturing" the socio-economic imbalance between the richer Denmark and the poorer Scania.

Figure 4 - Eva de Klerk, NDSM shipbuilding warehouse redevelopment, Amsterdam north, The Netherlands, 2000 onwards. The unexpected availability of abandoned ex-industrial evidences, such as the Kromhouthal, follows the building marked drop down. Incremental design policy profits of the "meanwhile use" to insert ephemeral apparats in the vacancies, turning them into temporary exhibition spaces and market hall.

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The Vacant City as the contemporary substratum.
Why and How the crisis enables regeneration processes.

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Keywords: *abandonment, claim, regeneration, convention, praxis*

Abstract

The Vacant City is the heralded outcome of the crisis of former Urban Renewal processes and later global densification strategies. However, this was not, as many were- and are still- arguing, the effect of a conscious decision driven by financial capitalism. On the contrary, it was the unconscious result of its legacy progressive abandonment forced by the "people of the debt". Because of that process, they became increasingly aware of performing simultaneously as victim as well as accomplices of the former perverse mechanisms. Consequently, we have been witnessing the loss of the implicit conventional bond between the society's member behavior, their productivity and the city's spatial arrangement. Assuming this framework as its explicit premise, the paper first questions the nature per sè of existing building abandonment condition, tracing it back to its historical precedents, and its functionality within the city's life cycle, analyzed it in the light of existing power-relation system criticism. Secondly, it reflects on the fact that the concept of substratum, prompted by the processual typology mainstream, is inextricably related to the emerging claim of vacancies and waiting lands as the immediate reaction to a declared crisis. Finally, to support those interpretations, the paper will present some contemporary emerging phenomena, by which the reclamation of abandoned areas is leading to unpredictable regeneration processes. To conclude, those actions will be described as unprecedented evidence of praxis, compared to the traditional ones. New form of conventionality will eventually flourishing from this scenario.

Planning aporias

The continuing post-crisis international economic and financial situation has produced an alienating paradox in Italy, only partly attributable to the programmatic discrepancy between Plan and Process. The first - understood as the *instrumentum regni* of territorial transformation - expresses, in fact, an essence based on economic, social, and cultural relationships whose stability and duration are presumed in the period under consideration. It thus acts as interpreter and guarantor of requests from stakeholders who, within a structurally "organic" perspective of meaning, become the protagonists of these, legitimising them politically through specific role attributions firmly directed at implementing their predictions. The Process, by contrast, intervenes as an unpredictable destabilising factor to undermine the temporary certainties established by the Plan through temporally distinct, yet complementary, methods. One expresses itself surreptitiously, or in a capillary and pervasive way, during planning activity, exhibiting the unstable equilibrium of the conditions that underlie it and explain its conventional character. The other, however, erupts into an *interregnum* phase, i.e. it occurs suddenly, whenever a problematic phase of institutional vacancy occurs in which previously consolidated power relationships are lacking and new, creative energies are consequently released, demanding a degree of visibility on the urban scene and corresponding to a different interpretation of the public function.

This apparent conflict, which should not be seen as dialectical in nature, can be resolved in a desirable complementary relationship only if it is accepted that the two terms, Plan and Process, merely express the oscillating polarity from which mutual recognition derives the concept of civil history, seen as phenomenological epochè (from the Greek ἐποχή)[1] , and – with it – existentialist philosophy, at least in Western thinking (Marzot, 2017). However, in the type of case that we are experiencing, that healthy alternation is mortgaged by the very nature of the interests at stake, born of a recent period in which finance has changed from a necessary tool to support innovative forms of entrepreneurship into a perverse concern for profit, generating chain distortions with the complicity of the Plan itself, whose drive is unfortunately far from exhausted[2].

These assumptions, material and immaterial, inevitably lead to a story that aspires to a responsible *redde rationem* of the many persisting barriers to effective regeneration policies for the city experiencing the crisis, generally expressed verbally but unable to stand up to the facts.

Financial origins of the crisis

A spectre is haunting Europe: the Vacant City. This term effectively expresses the state of the contemporary city, suspended between the "no longer" of the Network City[3] , as a complete expression of the creative finance - and the related excesses - that has driven its development, and the "not yet " of the city to come, looked forward to as confirmation that the crisis can be overcome. The Latin etymology from which the English term derives can be traced to the verb *vacare*, conveying the idea of "moving away from", applicable to any form of operosity[4] . However, the factors that have triggered the progressive stagnation and implosion of the property market are already latent in the crucial transition from industrial to financial capitalism[5], which paradoxically feeds on a persistent state of crisis as its own condition of existence. This "exceptional" vacancy situation, the expression of a programmatic "incompleteness", must be elucidated in advance, in order to reveal its unprecedented identification with a new, as well as perverse, condition of "normality". Historically, this event coincides with the production system's view of money no longer as a tool[6] for the promotion of growth, development and employment, but as the objective of its production strategies. Such a phase has begun, a sure indication of an entire economic cycle that has been steadily weakening since the subprime mortgage scandal of 2007, in which financial services based on minimal investments in research and development, and generating far greater profits than those produced by traditional manufacturing or personal services, are spreading throughout the world in a way never previously seen.

Over time, this changed perspective implies profound transformation of the nature

and dynamics of the construction industry. In the year 2000, coinciding with a collapse of the share prices of so-called Blue Chip companies in the information technology sector, apparently in irreversible growth up to that point, there was a progressive shift of investments from intangible to tangible assets. Leaving aside the commodities sector, which remains strategic, the construction sector immediately benefited from the favourable circumstances associated with Europe's use of the new euro currency.

It can now be seen as a false dawn. Financialisation of the economy translates, in fact, into a fanciful link to property development that purports to generate the multiple transactions that are the real guaranteeing of investment[7] profitability. In such circumstances, the apparently unlimited availability of financial resources at highly competitive interest rates, with minimal guarantees offered by the beneficiaries, encourages new operators to enter the property sector and induces existing ones to undertake business initiatives essentially driven by growing expectations of income and growth with distant prospects of success, having been developed in the absence of careful assessment of market needs.

In other words, the necessary premises for the financing projects, though desirable, do not currently exist, but are systematically deferred to a spatial and temporal "elsewhere", to be awaited with messianic faith[8]. The interpreters of this process, from promoters to end users, are thus virtual, not real, entities, simply taken for granted, like the bank securities of which they become a prerequisite in a manner fully consistent with the principles of financial mathematics and its algorithms.

Hybrid City and deterritorialisation

The perverse effects of a constantly deferred realisation of the expectations of property development are amplified by the fact that the production of money, by its nature, programmatically disregards the existence of defined territorial entities, or of political, social, economic and cultural entities capable of governing their own affairs (Galimberti, 2018). Furthermore, the related flows are transversal and supranational in nature with respect to all forms of administrative limits, delegitimising their functions. In this way, excessive financialisation of the economy seems to escape the control of the institutions, unable to collaborate in a network context, and of the agents of transformation, unable to match their expectations to local specificities.

The scenario is made even more complex by the contextual alteration of the very concept of territory which, given current circumstances, coincides with the pervasive loss of significance of the notion of the metropolitan area in favour of the prevailing phenomenon of urban networks. The unprecedented increase in the mobility of financial resources, goods, services and people, fed by growing investments in the infrastructure sector, at least in the most virtuous cases, programmatically destabilises the maintenance of consolidated administrative boundaries, causing their identity characteristics to implode, and compelling a review of all the links between active forces and related systems of expectations based on relationships of geographical continuity. The consequences of this process are of epochal significance and, from the urbanistic point of view, widely underestimated even by latest-generation Plans.

Consequently, economic growth factors act selectively, favouring the most rewarding locations - with regard to multiplication of relational opportunities in the economic, social and cultural spheres, - in a highly logistical perspective. It follows that investments mainly benefit companies that already possess high infrastructure standards, thus exacerbating the discontinuity of economic rents. The apparently paradoxical effect of this process is the creation of new settlement configurations, the aforementioned Network Cities, no longer based on the hierarchical relationships of metropolitan cities, but on the predominantly horizontal relationships between urban systems of similar specialised levels, enabled to perform better in the international marketplace (Marzot, 2018).

The programmatic disorientation of settlement as a synergistic outcome to the multiplication of transactions, shrewdly fuelled by creative finance, mirrors that of local political forces, unable to manage interactions with interests that act on a global scale and losing all sense of identity. In fact, the latter would require full assumption of responsibility

among the various interpreters through the establishment of local roots, something the new production methods deliberately ignore.

The reaction of the property market

The picture painted above - in which the prerequisite for growth is a paradoxical "state of permanent deficit" - explains why the effects of the 2007 debt crisis and the 2008 financial crisis have had a dramatic effect on the European property market. The traditional relationship between supply and demand in this sector has been completely altered by a system of expectations, both incoming (i.e. of specialised operators) and outgoing (of end users), totally independent of reality. The former have benefited from easier access to credit, their eligibility guaranteed by mere expectations of transformation, written into the balance sheet, rather than economic worth. The latter, likewise, have contracted mortgages for the purchase of properties in the belief that solvency can be delayed, based on an assessment of stable and lasting employment conditions, even if these are not improving as hoped for. Both have thus been complicit in a life project based on deliberately misleading assumptions, its feasibility programmatically postponed according to financial algorithms[9].

The identification of money with new ways of production has quickly become an aggravating factor, transforming the financial crisis into an economic one, with immediate loss of employment and drastic falls in public and private spending; families, their saving capacity gradually eroded until dwindling to nothing in a few years, have been compelled to try to replace the networks of protection and social solidarity that the previously responsible institutions could no longer guarantee. This has proved to be particularly difficult for Italy because of its chronic infrastructure deficiencies and chaotic public expenditure out of control, allied to a programmatic inability and disinclination to attract international capital.

If the national picture raises legitimate concerns, the regional one is no less alarming. Recent research[10] covering the whole of Emilia-Romagna reveals that local government Structural Plans are still strongly characterised by expectations of growth that no longer correspond to the new reality, with increasing calls[11] for reduced land use and further policies based on regeneration of existing resources. If the data in itself is unsurprising, given the implicit inertia to modification of the Plan, with its programmatic mission of conserving existing power relationships rather than relative modification, which cannot be attributed to those conditions of stability that a shared project requires, it is interesting to analyse the different behaviours demonstrated by those who claim a role as protagonists, in various capacities, in the transformation process for the territory.

The Plan and its protagonists

Operators in the property sector, especially builders, who play a unique role in Italy[12], have a particular interest in the transformation process described above. In more innocent times, i.e. prior to the speculative subprime bubble, and consistent with the guarantees of expectations and territorial performance contained in the Plan, they have allocated enormous resources, only nominally their own, to greenfield sites of new settlement expansion, taking out mortgages in order to exercise onerous option rights in the best cases or to purchase of land in the worst. For guarantees they have relied mainly on expected, rather than real, transformation values either from the mortgaged properties or virtually cascaded from previous financial transactions, or, because of tax relief, on the underwriting of property shares. As a sign of the crisis, the high levels of credit granted to them have inevitably led to an exponential increase in requests for repayment - by the lenders, banks and financial institutions - of capital rendered unfruitful by the lack of demand for transformation, and property operators have found themselves in a corner. Despite the lesson of persistent stagnation and implosion of the property market created by their own actions, and with numbers of unsold or vacant properties rising incessantly, they have continued to seek further development of land merely to keep alive those very expectations of transformation value offered as guarantee of their investments.

The administrators, who have directly participated in promoting and defending these

same interests through the provisions of the Plan, have found themselves in an equally uncomfortable situation. Having benefited in recent election campaigns from programmes geared towards drastically-reduced land use, including densification of the existing city area, they have tried to redirect transformation towards brownfield sites. However, the attempt has failed miserably for the same reasons that have led private operators to demand compliance with forecasts that conflict with the new reality but are consistent with the expectations expressed in the Plan, exacerbated if anything by the impossibility of drawing on public funds. As If market stagnation and lack of demand, except in highly specialised niche sectors, were not enough, private capital is not available, having been locked up in areas of new expansion for reasons noted above.

As a corollary of the above, we may note the contribution, fortunately minimal, of a highly ideological and radical chic intellectual elite who, in the face of the persistent crisis and the apparent impossibility of reactivating the huge amount of unused properties awaiting transformation, cynically applaud the idea that they be abandoned to a condition of romantic ruin, as a warning and perennial monument both of the failure of the Plan, unable to adapt to changed boundary conditions with appropriate tools, and of the evident implosion of financial capitalism, which has remained hostage to its own perverse practices and equivocations.

While pursuing clearly biased objectives, they fail to realise that the intentional exclusion of an important part of existing cities from any form of transformative forecast and the deliberate refusal to acknowledge the widespread porosities produced by the crisis, which are creating a new "negative" urban reality, according to an automatic writing that acts outside any form of planning intentionality or agent legitimacy of the Plan, consciously deprives the existing community of an emerging plural subject that demands ever more visibility.

The new agents of transformation

If the crisis has severely affected the traditional production of property value and protagonists of this process, it is equally true that it translates symmetrically into an unpredictable and potential resource for all those excluded from the market because they lack the minimum entry requirements or because they abruptly left it due to the crash that followed. These tend to be the young, who experience structural difficulty entering the world of work and face a chronic lack of social security (guaranteed only by what remains of the public services), and those who have lost their jobs and now seek a new career, i.e. the constellation of professionals and small businesses that has constituted Italy's proverbial backbone since the immediate post-war era. This composite group constitutes a new, heterogeneous and liquid "Third State" which, although still far from conscious self-recognition and incapable of acting collectively, acts as a silent interpreter of the rebirth of the territories from the landscape of ruins into which they have abruptly fallen. No longer able to operate within the framework of normality that the traditional Plan legitimizes and embodies, its protagonists therefore demand new forms of expression, outside the rules that applied previously. For them, realisation of the expected valorisation of vacant property assets cannot be postponed. They seek not the financialisation of construction, but work creation made possible by reinventing things in line with contemporary moods and methods.

In other words, the revolution now underway implies emancipation from the condition of structural suspension and deferral of the manufacturing moment in favour of the conceptual one (although based on false assumptions), pursued through a radical reversal of the very idea of planning, no longer intended as an intellectual forecast but as a material prototyping (Ferraris, 2017). The Vacant City then ceases to present itself as the intentional expression of a "destituent" process, pursued by the *hybris* of financial capitalism, with the implicit objective of freeing the creative energies constrained by the Plan and its system of rules and dissolving *de facto* its bonds established *ex-lege*. On the contrary, it presents itself as a simple substantial presupposition, or substratum, of the imaginable "city to come", called by the "provocation" of the former to represent its ultimate destiny, to be pursued through a silent transformation, experimental and unpredictable

in its possible outcomes, of the building heritage scandalously disposed of in the previous phase and constituting the means of its continuing evolution.

This emerging and widespread reality, now dictated by the scarcity of available financial resources and the urgency and non-deferrable nature of the measures needed to create new employment, interprets the theme of urban regeneration in terms of radical and innovative experimentation - outside the acquired patterns of a world that no longer exists - capable of building its own rules by its own efforts and becoming the expression of a rediscovered "formativity"[13]. In this regard it needs suitable spaces, deprived of original conventional value, with which to recreate the conditions of possibility so that a new form of collective planning takes shape and is actualised, through distinct and interconnected phases of transformation and self-recognition. It is the nature of such spaces, therefore, to require a Plan moratorium in the form of a suspension of those conditions of strict normativity, legitimated only by circumstances of stability and recognition of the subjects, of which the Plan is an operative instrument.

Beyond the Vacant City, the urban ephemeral

The primary resources evoked already exist: they are the places of abandonment that the crisis has multiplied – dissolving the "resistant" bonds of extended urban networks – through the widespread porosity of the contemporary urban fabric; accidental wrecks of a project that has exhausted its drive and de-territorialising function, awaiting new interpretations; desirable promises of a possible city, as yet unrecognised by any instrument. As the time frame of the Vacant City suddenly contracts, an evolving architecture emerges at its edge through its very interstitial condition, formless, pervasive and capillary. It stands between the "no longer" legitimised by the existing Plan, the "passive" accomplice of urban networks, and the "not yet" of the Plan to come. In their bareness, its spaces evoke those anticipated from recolonisation of the territory by the "Third State" mentioned above, with minimum investment of financial capital and maximum return in terms of transformation work[14]. The new Ephemeral City, changing in its experimental transience, simply asks to be cultivated, recognised and interpreted, not as a marginal and shunned reality but as a new centrality of the political agenda, capable of promoting a network of new relationships based on claims of temporary use. Only time will tell which will be able to "migrate" to a new horizon of relatively stable meaning in order to legitimise their corresponding operating forces, giving them full public visibility and recognition.

Fortunately, successful experiences of this kind already exist[15]. However, they still constitute initiatives of mainly cultural interest, sometimes driven to the limits of legality by the lack of a regulatory framework that accepts them and legitimises their spontaneous multiplication; testimonies of the change taking place, yet to reach full awareness of their mission. In this regard, there seems to be something of value in the experience of European countries with more solid traditions in the property sector, such as Holland, England, Spain[16] and Germany, where such claims have always been instrumental to the generation of value, performing a fundamental trigger function. These cases involve organic experiences in the construction and transformation of the Plan, understood as a shared project despite its different local interpretations, whose social, economic and cultural purpose is to provide an indispensable gestation laboratory sustaining the discipline of urban planning in a pragmatic manner. This confirms the need for a systematic openness to the new in the forms and times in which it reveals itself.

In these situations, the temporary regeneration of unused spaces responds to multiple objectives and interests: it guarantees owners that properties suitable for transformation will be maintained and their associated costs reduced; it allows the authorities to increase public safety in areas otherwise exposed to illegal activity and vandalism, with no additional burdens on the community; and it acts as a source of minimum capital investments and a maximum in terms of generated labour and employment to offer emerging entrepreneurial forces the conditions for implementing forms of free interpretation of space and gaining awareness of their abilities, in the hope that they will be translated, at least in part, into new shared and communicable practices. It also allows the Plan itself to

test in advance new forms of economy, sociality and culture that it can come to encompass for a non-traumatic renewal of its own instruments, by means of a transitory "project in the absence of pre-established functions" (Agamben, 2017).

Bologna as a model of urban prototyping

If the Vacant City is the result of the progressive dissolution of the European city[17], harried by the forces of global financial capitalism from the start of the post-industrial phase[18], it likewise constitutes the precondition of the processes of urban regeneration, which multiplied in the old continent after the financial and economic crises of 2007. A necessary, but not sufficient, condition for the inoperative building heritage to "pass the baton" is the self-suspension, for a defined period of time, of the deontic function of the Plan, which prescribes the fate of each area into which the territory is administratively divided, establishing its uses, methods of intervention and eligibility criteria in order to protect the collective interest. This seems to be the inspiration for the Emilia-Romagna Region's new Urban Planning Law no. 24 of 2017, designed to curb land consumption, even in the face of a now evident contraction of the property market. In article 16, the approved text introduces, for the first time in the national urban planning discipline, the notion of "temporary uses", intended as innovative action to counter degradation of the city and reactivate the abandoned and unused heritage by means of prior cataloguing on the basis of the "Register of properties made available for urban regeneration" established in article 15. In this sense, and reflecting a process still in progress, the Region's legislation constitutes the partial precipitate of one of the most advanced experiments of planning culture at a European level in conditions of structural crisis. Its premises are traceable to work carried out in 2010 at the former Ravone rail yard in Bologna as part of an invitation-only competition, won by a combined team from PERFORMA A + U[19] Design Studio, Nomisma Srl, Unipol Merchant Bank and the Delli Santi & Partners law firm. The yard was decommissioned by Rete Ferroviaria Italiana at the end of 2011, no longer being used for its original purpose of rail freight, and transferred to its subsidiary FS Sistemi Urbani S.p.A., which was given responsibility for its redevelopment. Following installation of the new Council, in 2012 the Administration asked the client to draw up a new Master Plan for the entire area[20] to replace a previous Detailed Plan no longer considered adequate for the objectives of the new Structural Plan, which was delivered in 2013[21]. However, the continuing economic and financial crisis meant that the feasibility of the proposal as a whole could not be guaranteed. On 9 July 2014 the Municipality signed a memorandum of understanding with major stakeholders in the city's transformation– the State Property Agency, the State Railways, Cassa Depositi e Prestiti and Invimit. Mindful of changed market conditions, it also began drafting a Municipal Operational Plan specifically dedicated to public assets, including the Master Plan proposal for the former Ravone freight yard mentioned above, the first such plan in Italy. From the outset, a need was seen for a drastic reduction by about two thirds of the quantitative forecasts, to be implemented in the five-year period of validity of the Municipal Operational Plan (POC) in order not to further jeopardise a market already under stress and to maintain the value, now considerably reduced, of unused assets. In concert with the technicians of the Public Administration, the timescale for the developments outlined in the Master Plan was modified in order to mitigate its likely impact[22]. However, the general opinion now was that the minimum conditions for action to increase values did not exist under the rules inherited from the previous stages of the urban plan. In this regard it is worth noting that by 2012 the planners had already suggested, both to the Administration and the client[23], that the interregnum phase from then until the time when, it was hoped, the enhancement phase might begin, offered an opportunity to exploit the abandoned industrial buildings, which were no longer required for railway operation and were still standing, and the associated shunting yards. These assets were known to be in a good state of repair, were highly flexible and would be immediately available after modest improvement work, the cost of which would be compensated for by their intrinsic value, and which would prevent the inevitable deterioration that abandonment would cause. With hindsight of the dramatic economic-financial crisis indicating that any idea of urban planning was destined

to fail at that time, becoming no more than a rhetorical exercise of style, it is clear that intuition was the only possible approach given what was then known (Fig. 1). Through the construction of animated simulations, the possibility of rescuing existing properties from a condition of oblivion evolved progressively into a plausible prospect of enhancement[24]. Therefore in 2018 the Client decided to publish an initial "Invitation to tender" for the assignment of 9 properties with adjoining uncovered areas, for a total of 40,000 square metres of gross surface area, on the basis of a two-year interest-bearing loan, under the provisions of article 73, mentioned earlier, of Bologna's Urban Building Regulations (RUE). Only one tender, invalid because it proposed a timescale double the one specified, was received, but it persuaded the client to issue a new invitation for a 4-year project, which was successfully awarded in 2019[25]. At the same time, Studio PERFORMA A + U won a new invitation-only competition for the Urban Planning Implementation of the Ravone sector, under the provisions of the "Regeneration of Public Heritage" POC approved in 2016, becoming design consultants with responsibility for management of the area intended for "temporary use", which was officially announced to the press with the acronym Dum-BO (Multifunctional Urban District of Bologna) and inaugurated on May 10 at the JOINT outdoor event[26].

Since then, the objective of the Ravone urban regeneration project, through the drafting of a "Temporary Uses Master Plan", has been to ensure, as had been foresha-dowed from 2012 onwards, that procedures and effects resulting from ongoing experi-mentation described as "temporary uses", as per article 73 of the Building Regulations, may migrate within the drafting of the Urban Implementation Plan (PUA), constituting its trigger phase, to guarantee effective rooting in the socio-economic and cultural fa-bric of the consolidated city (Fig. 2). In this context, and through continuous interaction with the city's Urban Planning department, it has been established that the Master Plan, now operating *de facto* to ensure governance of the regenerative process and the corresponding system of rules, replace *de jure* the RUE starting from the approval of the implementation tool. In strictly disciplinary terms, this is an extraordinary result, unprece-dented in Italy. The decision, which will be ratified by the remarks to the Preliminary Ur-ban Implementation Plan, delivered on 12 February 2020, implies that, for the first time in Italian urban planning, through implementation of good practices put into operation in the temporary laboratory of Ravone, a regenerative project - by its nature incremental, collaborative and experimental- has been recognised as a legitimising process of the Plan, and that the corresponding "document", i.e. the "Master Plan for temporary use", defines its founding principle[27], to which the whole implementation planning will be re-quired to adhere, both in the articulation of spaces and in the temporal sequence of the implementation phases. Ephemeral transformation of the Vacant City, freed from the prescriptive cogency of old generation Plans, is thus confirmed as the tool with which to create a circular model for the resilient city of the future, basing its vision of it on present needs, taken in their competitive evolution (Fig. 3).

Closing comments
The pioneering experience with the former Ravone rail yard in Bologna confirms, if it were needed, that the reaction to the crisis in the property market is already redesigning the city according to ideas anticipating establishment of the Plan. The temporary mora-torium is, therefore, a necessary but insufficient condition that allows the forces emerging from the landscape of ruins left by the collapse of financial capitalism and the world around it to find expression, in the wait for what is to come (Fig. 4). In these circumstan-ces politics has the task and responsibility of creating the suitable conditions that will al-low this to start and develop, encouraging the promotion of a network of initiatives that aspire to colonise growing urban porosities, cultivating them and monitoring their quality and ability to stand the test of time. There are moments when one becomes aware that the plan is indistinguishable from existence as a life experience. The current one is one of these. It would be unforgivable not to seize its opportunities.

Fig 1

Figure 1. A decommissioned railway depot in the ex-freight yard Ravone is fictionally adapted for hosting co-working activities. This scenario was proposed in 2012 to trigger the imagination of the client and the local Administration in order to deactivate biases still resisting to "meanwhile uses".

Fig 2

Figure 2. The "Temporary Uses Master Plan" was, since DumBO inception in 2019, is intended as a *in progress* "collage" to engage the members of the scientific committee, assumed as the most important stakeholders involved within the regeneration process. As such, it was enabling the interplay among the available vacancies (the context), the potential drivers of change (the actors) and the expected effects (the activities), presuming design actions.
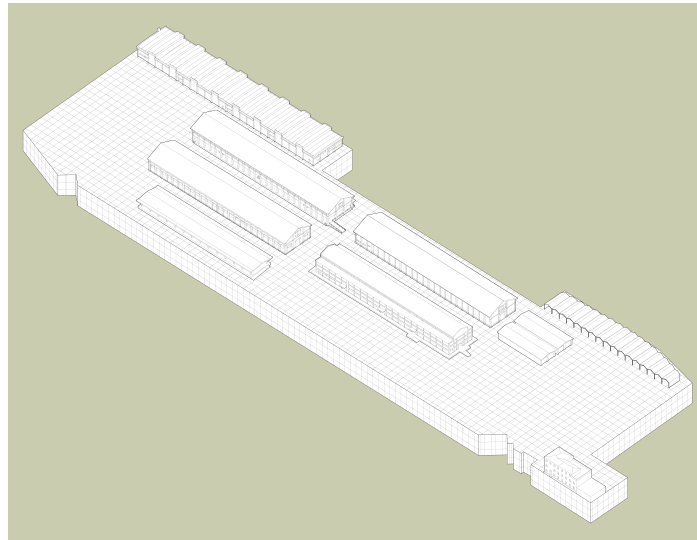
Figure 3. The area hosting DumBO, interpreted as a sample of Vacant City. The axonometric view of the decommissioned warehouses, reciprocally isolated by an isotropic anonymous surface, explicit quotation of Radical Avant-garde, effectively depicts the atmosphere of incompleteness characterizing any brownfield.

1. Prototyping

The theatre of practices

To prototype implies the exploration of unexpected possibilities inhibited by a pre-established set of rules (to search for the common good).
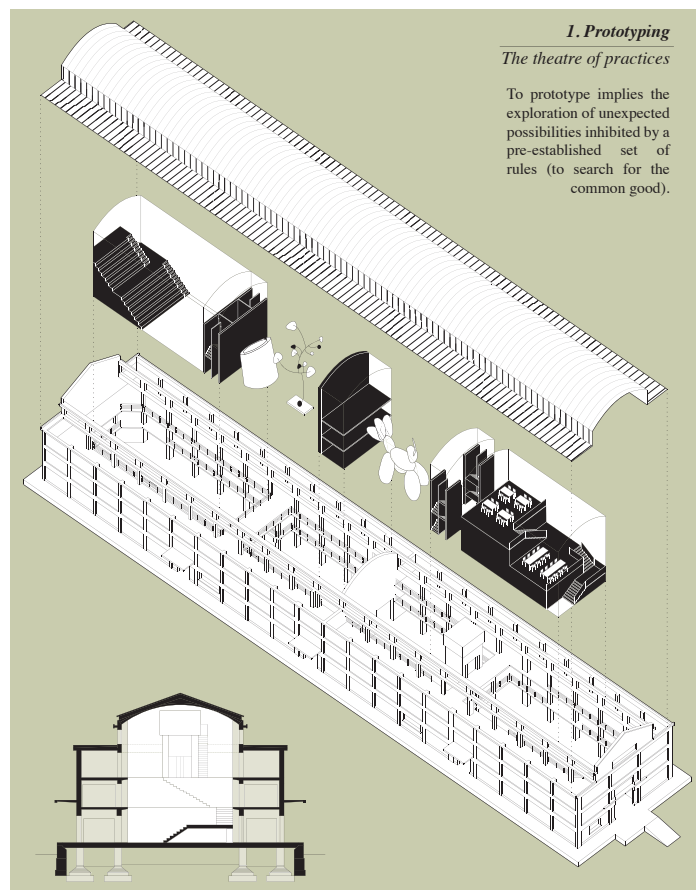
Figure 4. The Ephemeral City. The "theatre of practices", study case series. The *praxis* is here intended as a "prototypical doing", based on a heuristic approach, finalized to the exploration of unpredictable crafts emerging from it, both material and immaterial. Since experience guides the design according to a "learning by doing" process, it deliberately excludes any productive instance, notwithstanding it generated its unavoidable premise.

Notes

[1]No matter how paradoxical it may seem, the term should be understood as the impossibility of expressing a historical judgment in that one finds oneself "on this side" of the same conditions of possibility that determine it.

[2]It is worth remembering that financing means completing something. In this sense, the concept expresses the instrumental value of a fulfilment that paradoxically remains pending, or unfinished, in the interpretation given by globalised capitalism.

[3]See Nicola Marzot, "The Hybrid, the Network City and the Territory elsewhere. The contemporary fringe condition in north European urban phenomena" in Observations on Urban Growth, Editor Giuseppe Strappa, Publisher Franco Angeli, Milan 2018, pp. 189-211.

[4]The term is understood here in the particular sense of its use by the philosopher Giorgio Agamben.

[5]This process is clearly described in Cities in the Global Economy by Sassen Saskia, published by Il Mulino, Bologna, 2003.

[6]To be understood both as tax revenue and loans to businesses.

[7]The securitization of CDOs (Collateral Debt Obligation) is relevant in this regard. These securities are based on the growing expectation of the property market and on the contextual reduction of variable interest rates on mortgages granted for the purchase of properties.

[8]The credit system, by its nature, implies a "trusting" attitude, or a willingness to "put oneself in the hands of" someone who makes the investment fruitful (not surprisingly, the Πίστις of the ancient Greeks becomes, for their contemporaries, synonym of "loan"). The unprecedented question, in the financialisation of the economy, is precisely that the object of the investment is presented sub-specie as a simulacrum (the mirage of home ownership within everyone's reach), whose function is to extend as much as possible the wait for a fulfilment that, not being founded on real expectations, risks not being able to be realized at all.

[9]In the face of a continuous expansion of the spatial/temporal dimension of expectations, based on the apparently unlimited availability of credit, the virtuality of the market has in fact translated into the assumption of its own collapse.

[10]This refers to an award-winning research project submitted to the Emilia-Romagna SPINNER programme in 2013. Entitled "Progettare il costruito: nuovi modelli a qualità integrata per la città compatta", it was presented by Prof. Carlo Quintelli of the Department of Civil, Land, Environmental and Architecture Engineering, University of Parma, Prof. Giovanni Pieretti of the Department of Sociology, University of Bologna, Prof Vanni Codeluppi of the Department of Communication and Economics , University of Modena and Reggio, and Prof. Nicola Marzot, Laura Gabrielli and Pietromaria Davoli of the Department of Architecture, University of Ferrara.

[11]Subsequently recognised in the provisions of Regional Urban Law 24, 2017.

[12] The anomalous Italian situation, compared to the more mature European property sectors, arises from the coincidence of ownership and real estate development, which limits the degree of transformability of the investments and the ability to adapt them to changed conditions of use.

[13]This refers explicitly to the neologism first introduced by Luigi Pareyson in Estetica. Teoria della Formatività, first published in instalments in an aesthetics magazine between 1950 and 1954. In it, the Turin philosopher stigmatised the custom, widespread in the tradition of western thought, from Aristotle onwards, to reduce artistic and creative activity to a solely poietic dimension, assimilating it to mere production of objects, on the basis of rules already given. Deeply influenced by Existentialist philosophy, he instead declared the need to reflect critically on creation as a process constantly seeking its own modus operandi, which he defined as "formativity".

[14]Ontologically speaking, the nature of this "work" is still to be investigated. See Nicola Marzot, "Stato di eccezione, spazi in transizione e rigenerazione urbana. Note per una nuova cultura del lavoro", in Paesaggio Urbano, Issue 3, Rimini, Ed. Maggioli, pp. 5-9.

[15] In Emilia-Romagna, one remembers the activity of the Cultural Planimetry Associa-

tion, which has already promoted extremely interesting initiatives such as Spazio Senza Filtro in Bologna. See Werther Albertazzi, "Usi temporanei e rigenerazione urbana. Note per un'autobiografia scientifica", in Urban Landscape, Issue 3, Rimini 2019, Ed. Maggioli, pp. 95-103.

[16]In contemporary Spain, experiments in the temporary use of abandoned and unused spaces are now the principal means of urban regeneration, already recognised by local administrations for their social, economic and cultural aspects of public interest. The Estonoesunsolar pilot project, promoted by the Grávalos & Di Monte Architects studio, in collaboration with the city of Zaragoz, is a signifcant example.

[17]The position expressed corresponds to the thesis proposed by Vittorio Gregotti in Identità e crisi dell'architettura europea, Einaudi, Turin 1999.

[18]This phase coincides with the decommissioning of manufacturing sites in Europe, which began in the second half of the 70s.

[19]In 2008, the Studio, with its CITTA 'SOSPESA project, had already been selected from twelve finalists in an international competition for the design of the new integrated complex of the Bologna Centrale station, to join a temporary grouping of companies with MVRDV (Team leader), Arcadis, Atelier 10 and Sota.

[20]The proposal incorporates the provisions contained in an agreement signed on 18 July 2006 by FERROVIE DELLO STATO ITALIANE SPA, RETE FERROVIARIA ITALIANA SPA, FS SISTEMI URBANI SRL and MUNICIPALITY OF BOLOGNA containing economic/financial guarantees for the construction of the new Bologna High Speed Station.

[21]In the period between task assignment and completion, Studio PERFORMA A + U, mandated by the then Province, carried out important work as coordinator of the "Urban revitalisation and temporary uses" technical discussion panel for the Metropolitan Strategic Plan of the City of Bologna (2011-2013). This panel was created in response to an initial call for interested parties to develop innovative ideas for the future development of the city, open to all individual stakeholders and opinion groups as a means of sharing Plan development. As a result of its work, involving multidisciplinary collaboration between local government and civil society, guidelines were drawn up following critical analysis of experience at the local and national level, including the Ravone project. Some of the results were subsequently incorporated in the modified Urban Building Regulations (RUE) of the Municipality of Bologna approved in 2015. This stated that within the Mixed Transformation Areas, regulated by Article 73, all uses were admissible in the interregnum between adoption and approval of the Municipal Operational Plan (POC), without this leading to changes in the standard.

[22]Under this compromise solution. the only alternatives are to pursue the minimum objective to which the stakeholders aspire through the legitimising action of the Plan, or to retain the nominal values entered in the financial statements (which, although completely dissociated from reality, justify the support of the financial gearing, in a game of mutual recognition that is completely self-referential).

[23]Registering understandable reservations and resistances on both sides, attributable to the relative inability to recognise temporary use strategies of vacant properties as a means of generating value.

[24]The experience acquired benefted from the valuable collaborative efforts of the "Urban revitalisation and temporary uses" technical panel, including the pilot project for the Evolved Popular District, presented in Sala Borsa in Bologna on 18 March 2016, and drawn up by the same Studio PERFORMA A + U in association with Planimetrie Culturali the Bologna Academy of Fine Arts and DCM. The same group was subsequently consulted for its expertise by the drafters of the new Urban Planning Law of the Emilia-Romagna Region, with the aim of defining innovative tools to support urban regeneration.

[25]The successful bidder was the Open Group social cooperative, in partnership with the private company Eventeria, already operating in the organisation of public entertainment events.

[26]Seventy events have been hosted within the DumBO area since its inauguration.

[27]It will be the first time, in the history of Italian town planning, that the "Master Plan for temporary use" document has officially been incorporated in the Plan.

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Giovannoni's "diradamento" as a congruent transformation of urban continuity. Applications and limits of a philological device for core city regeneration

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Abstract

The text that is proposed for the conference will focus on the primary role played by Giovannoni in defining an original strategy for the protection and enhancement of urban heritage in Italy in the early decades of the twentieth century. It is in the projects of the ten years of 1910 that he outlined the theory of thinning. This theory is offered as an alternative to the aesthetic and radical reclamation of the historic city, an urban policy still widespread in the early twentieth century. The discussion that will be developed is related to the possibility of interpreting today the "measured" and "scientific" cut of the building proposed by Giovannoni, as a way to follow for the regeneration of old centers. In this regard will be analyzed the plan for Rome, comparing it with other significant examples of this type of approach to urban restoration. from these examples will try, finally, to understand if rules can be drawn for the current planning aimed at sustainable urban regeneration of public spaces.

Historical background

In 1913 on the pages of Nuova Antologia Giovannoni publishes two articles, in which he specifies the terms of an innovative conceptual approach to solving the city's problems and coined a new watchword: diradamento edilizio - thinning building (Giovannoni 1913a, Giovannoni 1913b). With these two important works, Giovannoni defines a conceptual scaffolding that moves between two opposing polarities: the integral preservation of the existing building system, to which every historian aspires, and the necessary modernization of the urban fabric, longed for by the engineers-hygienists. Between these two extremes he proposes a third way, that of agreement, of mediation, of meeting, or, using an expression dear to him, «of grafting the new onto the old» (Giovannoni 1913a).

This considered by giovannoni is a graft that, however, to the urban scale is not always configured as an addition, on the contrary, it is often concretized as a subtraction, where modernity is understood as ease of movement, direct connection, wide and smooth road system. *The modernization of the city, in fact, at the end of the nineteenth century, a time that in Italy coincides with the post-unification progressive ferment present in all the arts and also in the urban sector, is interpreted as the need to update the existing urban structure through the identification of new directionality, the enlargement of squares, the liberation of monuments.These renewal actions are linked to the positive feeling of novelty that pervades the political and cultural management of the new kingdom and are interpreted by the men of the time (administrators, politicians and people of culture) as gestures of "ordinary administration", as linked to the desire to update the infrastructure system of the existing urban structure.*

However, it is cultural will that always takes the form of demolitions, such as those "cuts", "insulations" and "road widenings" established in Rome with the planning of 1873 and 1883, whose forecasts concern exclusively the adaptation of the pre-existing road layout to the new needs of the contemporary world (Quaroni, 1969; Sette, 2004).

(Quaroni, 1969; Sette, 2004).

In the characterization of the so called "building master plan", which is the planning inherent exclusively in the inner district, i.e. the site of the ancient city bounded by the city walls (a planning that is different from the "building improvement plan", prepared for the expansion areas of the city), there are, in fact, only new straight lines with which new axialities are identified and extensions of squares with which new polarities are defined. These are, for example, the opening of Via Zanardelli, the tracing of the Lungotevere and Corso Vittorio Emanuele, whose construction has a considerable impact on the fabric of the city and, for this reason, must be made to fall - albeit with the necessary exceptions - in the generic category of "disembowelment".

However, alongside this kind of urban planning, which tends to break the links with the past in the name of hygiene, light, fast roads, there are those who, in the name of the uniqueness of the typical local characters, try to read the urban morphology not through the lens of numerical data, housing and building density percentages, but from the point of view of history and art, addressing the study of the existing through parameters that cannot be quantified and not homologated, but necessarily related to the deepening of the singularity of each case. Beyond the culture of hygienic engineers, on the pages of Nuova Antologia a different way of observing the city is beginning to be outlined and, within this perspective, also the clarification of policies to safeguard pre-existing urban contexts.

In fact, at the same time as the great disembowelments carried out in many Italian cities following the promulgation of the legislative provisions in favour of the city of Naples, which involve the loss of many buildings and historical contexts, many people are beginning to talk about «cities, the historical-artistic identity of urban centres and the problem of their protection and what is currently defined as the "artistic environment"» (Zucconi , 1989, p. 23). Gaetano Moretti and Luigi Beltrami took to the field to defend Venice, but also other Italian cities such as Milan, Rome, Verona and Bologna, where the shadow of the fascist "demolition pickaxe" is increasingly looming over them (Beltrami, 1892; Beltrami, 1902a; Beltrami 1902b). In 1883 Camillo Boito denounces the dangers of tampering with the local characters of individual urban contexts (Boito, 1883;). In 1887 Giacomo

Boni drew up a report in which he describes all those picturesque views and monumental episodes that would have been lost if the restoration plan for Venice had been made executive (Boni, 1887).

Beyond the individual personalities, in this context of increasing attention to the historical city with all its "picturesque" values, the Associations are beginning to play a fundamental role. The historical Lombard Society founded by Cesare Cantù in 1873 is active in Milan, and the committee for Bologna's historical-artistic Bologna is connected to the extraordinary figure of Ambrogio Annoni. In Rome there is the Artistic Association among the Culturers of Architecture (AACAr) of which Giovannoni is first a member (1910-1911) and then becomes its president (1914-1924) (Spagnesi, 1997, p.18). The Roman association was born, similarly to those present in the great Italian cities and mentioned above, to «promote the study and raise the prestige of architecture» (Spagnesi, 1987, p.13), i.e. with the main objective of studying the monumental heritage of the city and promoting its protection. It is for this reason that within the Roman association a special Commission is set up, with the task of cataloguing every single monument in the urban environment. The promotion and dissemination of knowledge is interpreted by the association as a fundamental act, because it is primary, as it anticipates and justifies any kind of protection and restoration of artistic episodes as such and in this perspective also requires the preservation of the historical heritage and its context through choices to balance the needs of modernization of the urban structure. From this point of view, the presence of associations in the cultural fabric of the city of Rome is becoming increasingly important, especially when it succeeds in introducing a series of foreign influences into the Roman environment.

The contacts, promoted precisely by Giovannoni and Maria Ponti Pasolini, with the precepts of Charles Buls and the influence of Joseph Stübben's thought, open the Roman urban planning culture to an 'environmental' approach, which allows, through the identification of an evolutionary path, the «declination in different ways the continuity with the tradition of places» (Stabile, 2017, p.136). The lesson on the aesthetics of the city that Buls, called by the AACAr, gives in the Campidoglio in 1902 on the problems of the Italian capital (Buls, 1903; Galassi, 1903), together with the words that Stübben **wri**tes on Architettura e arti decorative in 1909 about the debate around the new urban plan of Rome, have a strong influence on Giovannoni's thought. All this first of all with regard to the planning of new areas of expansion of the city, such as those expansion plans designed for San Saba, the garden village Garbatella, Ostia Nuova and garden city Aniene, in which it is possible to find the clear will to oppose the schematism of the rectangular grid, detached from the orographic reality of places, with the adhesion to a project in which there was a greater attention to "irregularities", to "landscape views", more eager to «use the picturesque effect of the apparently random for the formation of streets and squares with various figures» (Stübben, 1914). Therefore, on the basis of the teachings of Camillo Sitte, Joseph Stubben and Charles Buls for the design of the new city, Giovannoni finds the keystone for a new interpretation of how to act on the existing city so as to make it functional to the needs of modernity by declining in a "picturesque" sense the brutal practice of "disembowelment".

Il diradamento _ The thinning

The principle of thinning is proposed, in fact, as an alternative to the linear cuts of the rectifiers drawn by the hygienists, as «illogical and ineffective», since they are linked «to the vain illusion that the restoration of an area could be located on a line» (Giovannoni, 1913b). The rationality of thinning should be searched for, in fact, far from the a-priori design of alignments, but in the interpretative capacity of the urbanist architect to trace the flow of time, through the understanding of the formative logic of the city and its becoming. Therefore, having acquired the binding problem of sanitation and the need to provide air and light to the densely populated areas, the Giovannoni's solution is found in a double register of actions: those aimed at improving «the street element» and those aimed at «the home element» (Giovannoni, 1931). The conservation and protection of open space, a place of perception of ancient space, is placed on the same level as

that of the historical building, for which a detailed study is required, «house by house» on construction and compositional techniques, materials and their assemblages. This attention also reveals that the close morphological link between the road infrastructure and the typological system of the settlement, so that it can be said that «there is no building without a path» (Caniggia-Maffei, 1979) is perfectly understood by Giovannoni, who attributes to the topographical scheme of the settlement a «spiritual value» (Giovannoni, 1931) to be preserved in the adaptation of the existing to new life. Building and road system, in fact, are the two elements on which, therefore, must be placed with constancy the attention of the architect restorer, who must be able to read the existing through the lens of «style», to understand the forms of architecture, and «perspective» (Giovannoni, 1913b), to decipher the link between road and building and to verify the achievement of the «economic and aesthetic value» of the internal nuclei of the city achievable through thinning.

The valorisation of the existing urban system, he specifies, can, therefore, take place «by freeing obliterated elements of art, others by restoring them, prudently removing amorphous elements, opening up views and bringing back to the town the healthy and fresh beauty of the vegetation» (Giovannoni, 1931). Obviously, all these operations are complex, not obvious, nor linear, but they are the result of continuous mediation, conciliation between the scope of the hygienic, economic, road traffic needs with those of respect for the artistic aspect of the local structure. For these reasons the thinning out must be the «patient and loving» fruit of a modest action, without «doing too much, nor changing essentially the type, the order of the neighbourhood, by diffusion and linear arrangement».

The urban restoration project will be given by the sum of many «small local measures», implemented without major economic commitments or with the sacrifice of large portions of building, but «freeing without adding, improving without radically transforming», so as to obtain not a regular unity, but many «irregular enlargements, demolitions here and there of a house or a small group of houses, with the formation of a small square or a garden in their place ... adding variety and movement, associating contrasting effects to the original type of building that will remain, thus, in all its character of art and environment» (Giovannoni, 1913b).

This is the method. As for the architecture Giovannoni theoretically indicates a minimum approach to the restoration of historical core, based on «precise knowledge of the elements of various kinds, relating to houses and historical events, which are unchanging cornerstones, i.e. buildings of historical-artistic character that must be preserved the works and groups whose environment must be respected» (Giovannoni, 1931). The methodology unit is clear: thinning is a restoration action applied to the urban dimension of architecture and for this reason it must respond to the principles of minimum intervention, respect for all works of art and the environment, which is considered a «collective work of art». To these general precepts, given the particularity of the restoration case, an additional prescription is added: «following the fiber» of the consolidated urban fabrics (Giovannoni, 1913b; Giovannoni, 1931) . This expression constitutes the watchword around which Giovannoni indicates the ways in which to read and, consequently, compose the design act. The «following the fiber» is a concept and at the same time an action, which implies a deep knowledge of the object, is deciphering the existing and building an effective thinning because it is connected to the history of places.

On the other hand, any action aimed at pre-existence, be it a single monument or a historical city, for Giovannoni can only be restoration and restoration as such requires, as a prodromal act, a deep knowledge of the thing to which it is addressed. Therefore even thinning, as a gesture to be poured over the historical building and city heritage or a part of it, is a restorative act and, therefore, cannot begin other than the exercise of reading, understood as an understanding of the urban text.

It is not difficult to find in this cultural approach the echo of Geddes' thoughts (Zivas, 2008; Spizuoco, 2019; Manzione, 2019), as well as the French Poete and Lavedan (Giovannoni, 1931; Manzione, 2019). Both in the type of gaze to be reserved to the city, like an immense book of memory in which are written the stories of individual buildings and

the interconnectedness existing between them, and in the organic metaphor with which Giovannoni arrives at describing the city, represented as a living organism whose overall development is closely related to that of the individual parts.

Then, «following the fiber» could mean being able to identify the lines of development of the historical city, understand the building systems, the building types, the characters of the streets and their hierarchy within the urban morphology, the systematic links that compacts the urban organism, the quality of the aggregation of the building type, its mutations, its growths, its obstructions. However, the sense of protection present in the action of thinning represents, unfortunately, a derived outcome, since it is linked exclusively to the conservation of "permanent" building and morphological systems.

While its main meaning remains that of destruction.

This, in fact, is a tool used by the architect to re-establish the correct relationship between solids and voids, between built and open space, it is a means to restore the views, to allow light and air to enter the houses to restore the hygienic-sanitary standards necessary for a built-up area and for this reason it is concretized in a set of actions aimed at the demolition of those parts of the city that can be qualified as superfetations, incongruous additions without morphological coherence. To explain the meaning of the permanence Giovannoni uses the example of Bari that preserves its original scheme also after the many transformations that occurred between the 10th and 18th century, with the typical «permanence of the planimetric scheme» (Giovannoni 1932).

The urban morphology is the element of the urban system that offers continuity and recognizability to the settlement; therefore the historical knowledge of the city in its type-morphological development can allow the recognition of the «actual type of those parts of the city for which history is still a building reality». Here, however, the ground becomes slippery, since the city is not a finished work and the additions constitute the norm within its long "duration". Knowing how to distinguish an adequate addition from a superfluous one, that is a pleonasm without necessity, is not an easy thing. It is possible, perhaps, to use the categories of the firmitas, if constructively it lacks those characters that meet the criterion of stability and good construction. Or those of the venustas, if the added parts are such as to spoil the aesthetic appearance of the building itself or even the surrounding environment.

However, for the restoration it is difficult to establish a definitive form for the formative process of the city, even just a small part of it, because it never becomes a finished work, «a fact of history and style» in Brandi's words (Brandi, 1967). A work, that is, on which the conscience of our time prevents us from intervening and, therefore, where every addition can only be superfetation and therefore identifiable as such. Giovannoni in this does not help us to understand and act accordingly.

However, this approach, if it supports the idea that urban planning is awareness of the city as an urban organism, it does not help to be aware of addition as a superfetation. The principle of continuity in the history of urban planning can, instead, constitute a foundation for the concept of custom, of tradition.

Tradition, in fact, is nothing more than a transmission hole in time, from one generation to the next, of memories, news, testimonies; it is the permanence of customs, of habits and customs, of models and norms. In the flow of time that connects the past and the present, tradition is the continuity of the elements that characterize the environment; for this reason Giovannoni interprets it as a fundamental element for the regulation of thinning, which is proposed to us as a complex gesture composed of: protection, conservation and transformation of the city. A gesture made in the continuity of the traditional way of living and building. Tradition contains in itself, therefore, not only the tools for deciphering the historical building, but also those for its design; tools that Giovannoni specifies in «style» and «perspective» (Zucconi, 1997). The urban project, in other words, must be examined on the scale of architecture and based on what he calls «building art effects», which are based on the contrast of volumes, on the «harmonious picturesque irregularity» and must be verified through the «perspective effects» they produce. Therefore, more than indiscriminate cutting and morphological reshaping of the city, the thinning must take place in the belly of the blocks, where the type of building has changed, increased

and clogged those spaces that should have been free, to give air and light to the houses.

In the text Vecchie città edilizia nuova, published in 1931, to evoke this kind of growth, like Marc Antoine Laugier and taken up by Poëte and Lavedan, the biological metaphor of the city as a forest is recalled, in which «historical facts become urban facts», since they are recognized as significant within the evolutionary process of the city. However, this intuition also becomes a risk, that of using history as a project system, applying the knowledge that derives from it to discriminate what is considered essential, authentic or "characteristic", from what is not and that, for this reason, can also be removed from the city palimpsest.

For Giovannoni, in fact, history in its universality and urban history in its particularity has a strongly pragmatic connotation, since its deep knowledge allows the architect, like the urban planner, to respond to a moral imperative: to know in order to act (Calabi, 2002).

The theoretical principle and practice

Since the translation of thinning from a general principle to a specific approach for urban planning takes concrete form in the interpretation of the morphological process of formation and transformation of the urban structure, it is only in the reading of the individual 'cases' in which this practice has been implemented that it is possible to understand the actual consistency of the achievable balance between 'permanence' and 'transformation' as well as the extent of the 'grafting' for the completion of the prospective frameworks set up for design verification.

The plan for the redevelopment of the Roman quarter of the Renaissance (Giovannoni, 1946; Spagnesi,1997), for the accommodation of Bari vecchia (Giovannoni, 1932; Pane, 2007; Mangone, 2019; Moschini, 2019), Bergamo alta (Giambruno, 2007), of the accommodation program designed for Split, are some of the examples from which it is possible to draw indications on the applied balance of actions between conservation, innovation, reconstruction. In truth, there are many studies that have been carried out over the years on such applications of the principle of Giovannoni.

Giovannoni's project for the area of the Roman Renaissance quarter around Via dei Coronari, not unlike the one elaborated by Concezio Petrucci for Bari vecchia, is considered a fundamental ground for the experimentation of thinning theories. From their observation it is possible to deduce some fixed points around which the theoretical principle is lowered in the practice of "case by case".

The crossing roads, necessary for the fast circulation inside the city, must never cut across the existing roads, but following the fiber of the neighborhood are formed as non-uniform expansions of the existing routes «thus avoiding the division of blocks into irregular and badly usable lots, but respecting the type and character of the city».

These expanded roads must respond to «a precise kinematic function». The cutting of pre-existing building nuclei must respond to a logic of expansion of the city and the crossing paths must signal the expansion lines of the new city districts. In order to identify these routes within the dense old nucleus, it is necessary to identify the parts with the least historical-artistic resistance. The demolitions, in essence, must involve buildings of lesser value, and as little as possible, thus changing the pre-existing perceptive conditions as little as possible.

These are apparently small measures, such as «removing bumps in the corners», «reducing local bottlenecks», which facilitate vehicular traffic and allow public use of the street and the square. These, in fact, should be furnished with flowerbeds and fountains «snaking between greenery and flowers», enriched with honorary monuments or bare elements (Giovannoni, 1931).

Once again Giovannoni urges the green project according to its resilient capacity, to interconnect the new with the old and to reconstruct that sense of singular intimacy that only the old building can evoke (Vitiello, 2019). This is a singularity that is reflected in the building character of the existing one, which in turn requires the thinning out of the houses, which in turn requires a restoration action capable of proceeding from the inside of the houses to the outside of them.

The procedure is explained in the dialectical continuity between tradition and per-

manence, where the search for the original characters takes place outside, on the skin of the buildings and giving the elevations of new buildings composed to sew the cuts generated by the new road system, the characters of acclimatization.

And inside the blocks, where the gutting becomes the dismantling of the superfetation, to be carried out in a perspective of typological brand that will then be fully developed in the planning of the seventies of the twentieth century, when the typological restoration becomes the imprint of some operations on an urban scale.

Thinning and urban regeneration

Thinning is, in Giovannoni's complex vision of the historical city, a form of enhancement of the existing. It is a redevelopment that takes into account social, cultural, economic and environmental issues that is implemented by calling for actions that are supported by a public-private partnership, i.e., on the one hand, by public administrations and, on the other, by "citizens' committees" that, from below, promote and share certain urban choices, which have repercussions on the housing, the social structure and the economic system of the city.

This complex reading of the historical city and of the actions that the restorer can prepare for its conservation, which sometimes escapes, if one focuses only on the "cutting" of the existing building that is part of the thinning out, is not unlike what is currently practiced with urban regeneration.

The term is derived from the ecological discipline and indicates the self-repair capacity of a system, but has the same meanings and practical implications that Giovannoni attributes to thinning. Today a "smart" and "green" economic-cultural model is added to the original conceptual framework, more devoted to the sustainable dimension of the city as a common cultural asset, as a whole, which is supported at a community level by a series of initiatives and which want the city to be a real driving force for development.
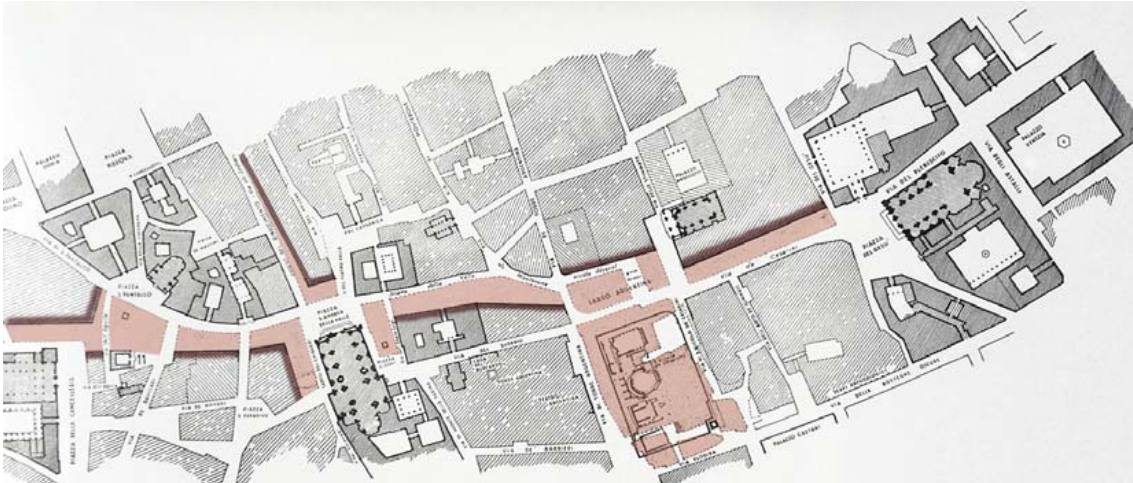
Figure 1. Demolition plan for the formation of Corso Vittorio Emanuele in Rome. Non-straight stretch indicated by Giovannoni as a good example of urban thinning.

Figure 2. Rome 1885. Urban demolitions for the construction of Corso Vittorio Emanuele and Largo di Torre Argentina. In red the buildings destroyed in the later years.
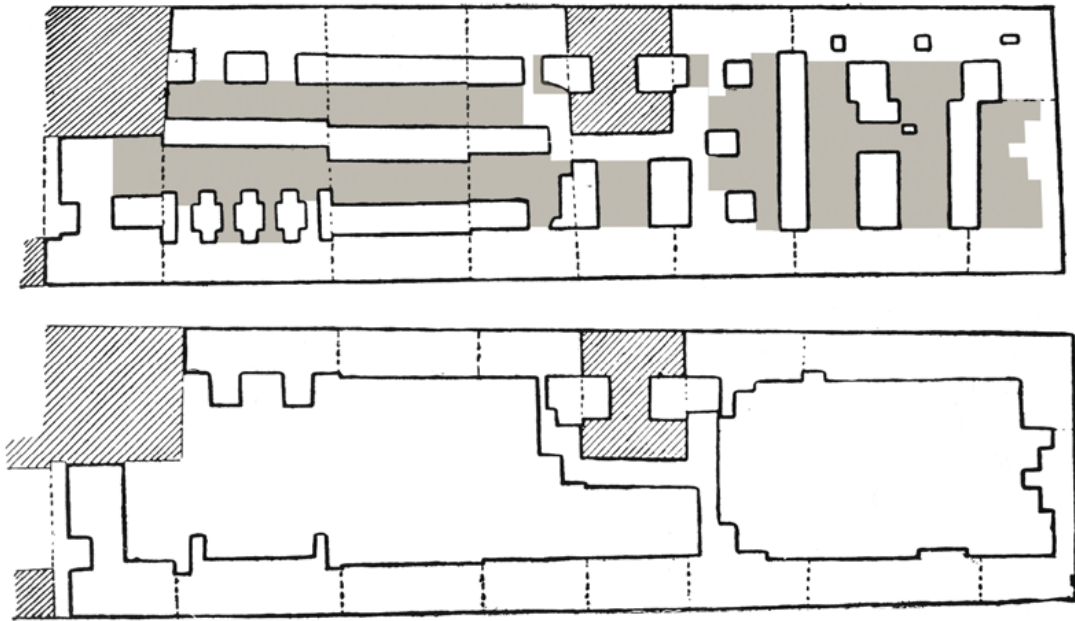
Figure 3. Example of the arrangement of the inner courtyard of a group of buildings in Via Emanuele Filiberto in Rome. Schematic plans before and after the arrangement with graphic reworking of the A., by G. Giovannoni, Vecchie città. New building, 1931, fig. 157.
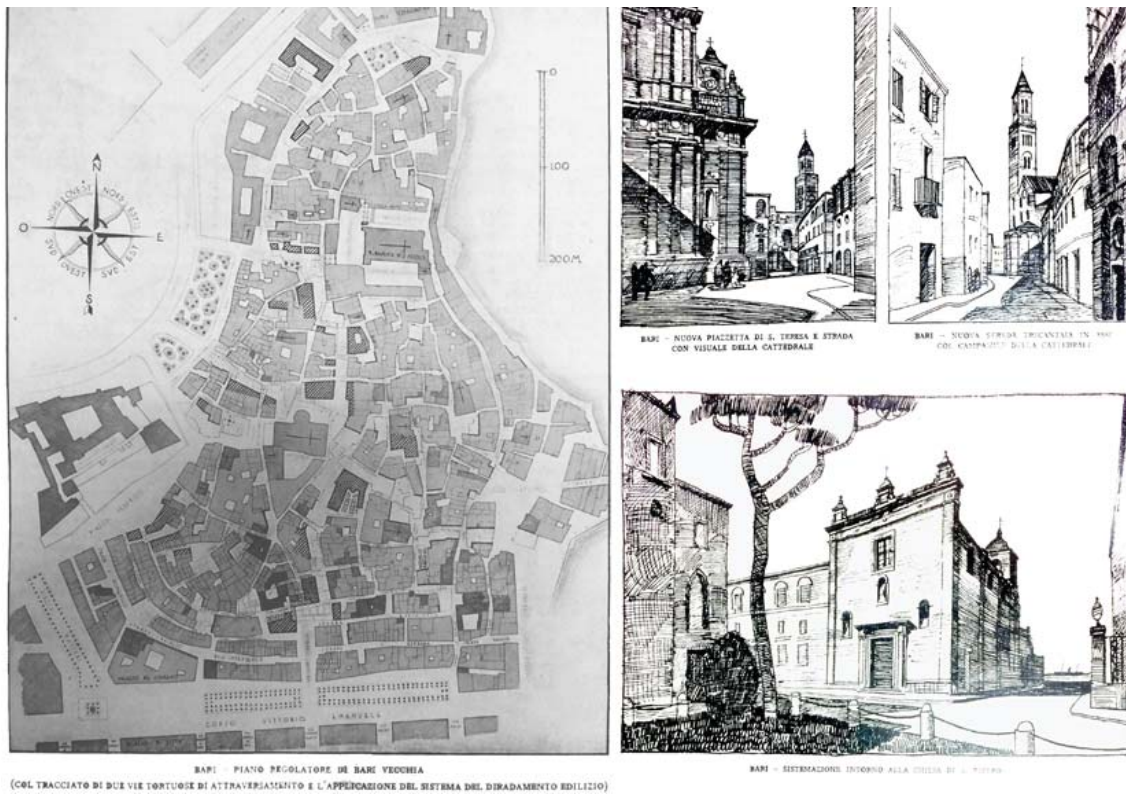
Figure 4. Bari old master plan. Concezio Petrucci's project drawings 1936.

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Shifting point-attractors: the central-symmetric flexi of via Flaminia and via Clodia near pons Milvius, Rome

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Abstract

Recent urban morphology studies consider urban tissues as living organisms changing in time (Strappa, Carlotti, and Camiz, 2016), moreover even roads may be considered as organisms, and their diachronic deformations have been recently interpreted by the theory of attractors (Camiz, 2018). This paper analyses the flexi on either side of the river Tevere along via Clodia and via Flaminia near Pons Milvius in Rome, and interprets them as the effect of the shifted position of a point attractor. The censor Gaius Flaminius Nepos established via Flaminia in 220 BC (Messineo and Carbonara, 1992), the via Clodia, running along an earlier Etruscan route, was instead paved in 225 BC. The pons Milvius, also known as pons Mollis, connecting the two sides of the river, was built by M. Aemilius Scaurus in 109 BC (Messineo and Calci, 1991), even though an earlier structure in wood is mentioned as early as 207 BC (Palombi, 2019). A flexus occurs along both the rectilinear paths of the two streets, following a central-symmetry. This central-symmetric configuration led to the reconnaissance of a differed attraction pattern within the trajectory of the road that we interpreted as the result of the modification of the ramps of the bridge occurred after the foundation. The cross comparison of documents, iconographic and cadastral sources together with archaeological evidence lead to the confirmation of the hypothesis, showing that the deformation and the consequent urban layering (Strappa, 2018) happened after the demolition of the lateral ramps in two distinct phases. The ramp on the south side was demolished by Maxentius before the battle of Ponte Milvio, held on October 28th 312 AD, the northern ramp was instead demolished during the bridge's restoration works accomplished by Giuseppe Valadier in 1805.

Attractors and repellers: the flexus along the via Flaminia

The attractor theory is a new experimental tool of analysis in the urban morphology field, introducing the diachronic analysis of the route's configuration. Roads change in time and we can interpret some of the deformations they follow as the result of the attraction or repellence of certain artefacts, defined here as attractors and repellers. Once an attractor appears into a network of routes, some paths could change their configuration and deviate from their former position following the attractor. A repeller is the inverse of an attractor, deforming the configuration of a path by repelling its traffic. Once an attractor has disappeared, its existence and position may be inferred by the formal analysis of the routes that have been deformed, determining a diachronical urban stratigraphy. It is therefore possible to infer the presence, type and position of a former attractor by recognising the deformations of the routes that were attracted by it (Camiz, 2018), (Camiz, 2019).

Despite the long title, this is a research about a crooked road. As you might notice, via Flaminia coming out of Porta del Popolo at a distance of about 200 m from Ponte Milvio deviates to the right of a distance of about 65 m, therefore aligning with the bridge's axis. The via Flaminia, or via Lata as it was named inside the city walls in Roman times, has a rectilinear configuration of 4,55 km from the Capitol hill where it begins all the way to the bridge, aligning perfectly with the city's gate today known as Porta del Popolo (Cataldi, 2016). Along via Lata there was also another triumphal arch (Arco di Portogallo) now disappeared. The Pons Milvius was built in different phases starting as a wooden structure in 205 BC, transformed into a stone construction in 109 BC, and Augustus built a triumphal arch built next to it to celebrate the restoration works of via Flaminia in 27 BC. No surviving image of this arch can prove its original position, but the image depicted in the *denarius argenteus* (fig. 13) of Augustan times together with its twin arch built in the same time in Rimini, now still standing, do suggest that the arch was designed so that the troops would march under it and that is was therefore aligned with the bridge, either in the middle as some suggest, or at the end.

The 'strada con fondale' architectural model

Following this same architectural model, Arcadius, Honorius and Teodosius built another triumphal arch at the end the Pons Triumphalis, on the Vatican hill's side, in memory of Stilicho's victory in Pollenza in 402 AD against the Goths of Alaric. We can now imagine the view of someone coming out of the city, along the rectilinear via Flaminia, where at the end of the road, instead of seeing the arch, he could see nothing, while the arch was on the side. The distance between the road axis and the bridge is 65 m and not 10 centimetres, so it could not be interpreted as a mistake or a design miscalculation. It is very difficult to imagine a highly symbolic street as via Flaminia not aligned with the triumphal arch positioned at its end. This road and arch system followed a widely adopted architectural model, that of the "strada con fondale" which starting from classical times was widely employed in the middle-ages, in the Renaissance, all the way to Baroque and Modern times. The monument axially placed at the end of the rectilinear road was framed by the monumental perspective given by the road itself, strongly enhancing its symbolic meaning. What is also surprising in the Ponte Milvio case is that the same flexus configuration happens on the other side of the bridge, but inverted, forming all together a central symmetric double flexus. Therefore, both sides of via Flaminia, or Clodia as one of the branches leading North was named, did not axially align with the bridge, and with the triumphal arch. This paper is about this flexus, or interruption of the rectilinear road coming out of the city towards the north. It is based on the attractor theory which basically states that if we have an attractor, which usually is a building, or a function, or a centre, or anything important, this is attracting the road. If the attractor changes position in time, e.g. a city changes position, or a bridge is moved, then the road follows in time, as attracted by the shifted attractor. Looking at the road, the attracted, we can notice (fig. 1) another bridge North of Ponte Milvio, and that later, after the bridge had collapsed, the route originally leading there was deviated as attracted by Ponte Milvio, but this is another topic, perhaps for the next paper.

Looking at cartographic sources we recognise in the XV-XVIII century that the bridge was characterised by two fortifications on either side. The drawing with the project for the new Via di Porta Angelica, attributed to the De Rocchi (fig. 2), also shows via Flaminia with the flexus and the connection with the bridge.

The first hypothesis that we considered to interpret this anomaly was that the bridge in some time was demolished and rebuilt in a slightly different position, and that instead of tracing *ex novo* the road leading to the bridge, the engineers decided to reconnect it with the new axis resulting in the flexus. This hypothesis was broadly contradicted by the inverted position of the flexus on the northern side. If the bridge had been moved the flexi would have been both on the same side of the road, forming a symmetric configuration and not as they are with a central symmetric form (fig. 11 and 12). Therefore, it is not possible that the shifted bridge caused the road's deformation. We should notice that the road level as it was in the XVII century on the southern side of the bridge, was some 6 m below the road level of the highest part of the crossing. In the side elevation of the bridge (fig. 3) we can recognise a wooden structure connecting the bridge to the Roman shore of the Tiber: the last stone arch was missing in that time. On the opposite side instead there was a lateral stone ramp connecting the last arch of the bridge to the road level towards Tor di Quinto.

The two fortifications were built in later times, eventually during the Gothic war by Belisarius (Palombi, 2011). The one on the North was called Tripizone, and we could not find any information about the one on the South. Both the constructions belong to later times and not to the classical phase of the bridge, which is known to be 109 BC for the stone bridge, and 27 BC for its restoration with the addition of the triumphal arch by Augustus.

The fortifications and the lateral ramp were both removed in 1805 when Valadier restored the bridge, and replaced the northern one with a neoclassical turret. A French bombing severely damaged the bridge in 1849 during the seize of the Roman Republic; Francesco Azzurri restored it once more in 1850 (Ciotta, 2007).

The etching by Piranesi, which is dated 1748, shows the ramp still in place and the drawbridge in timber on the opposite side (fig. 5). On the Alexandrinian cadastre dating to 1600 (fig. 4), we can clearly notice the side ramp, and what was left in that time of the Tripizone: the drawing also takes clearly note of the tower on the opposite side as well of the flexus of via Flaminia. The construction of the almond shaped square in front of the bridge with an axial view on the turret is attributed to Valadier who also attempted different solutions for the arrangement of the flexus on the southern side of the bridge (fig. 9). Within his project for a "Nuovo Campo Marzio" in 1805 he proposed a new street parallel to the Flaminia aligned with the Bridge.

Later in 1809 for the project of the "Villa di Napoleone" (fig. 8) he proposed an exedra. There is also another version of this project with a diagonal street as the continuation of the deviated tract of the Flaminia. We can notice the four roads approaching the newly designed almond square, all having flexi, showing that they were deviated from their original path, which was eventually on axis with the ramp, to align with the new turret. Valadier's project for the Flaminio area was never completed, but at the end of the XIX century the new road Viale Tiziano was accomplished, following one of Valadier's solutions and today is still there, perfectly aligned with the bridge (Ferri, 2018).

If weconsider carefully the road's transformations, by comparing the Gregorian cadastre with Valadier's transformation, we can attempt the reconstruction of the entire diachronical sequence. Archaeological findings in the area have shown a number of tombs, aligned along the Roman road, as well as tracts of Via Flaminia's stone paving, 1.5 m below the actual road level. Along the deviated tract of the road, in 1462 Francesco del Borgo designed the aedicule of S. Andrea, which in 1566 was enlarged to be the oratory and cemetery of S. Andrea, belonging to the Arciconfraternita della Trinità dei Pellegrini (Cantatore, 2013). On the western side of Via Flaminia, there was a villa named Boccapaduli, probably dated to 1735 as written on the entrance, which was aligned with the rectilinear axis of the via Flaminia.

The 'strada con fondale' architectural model

The other possible explanation is that there were two ramps on each side, as in *Pons Aelius* in Rome (fig. 15), to reach gradually the bridge's higher level, but in this case the ramps were orthogonal to the bridge instead of being parallel, and eventually with a central symmetric configuration. On the southern side of the bridge, and maybe even on the opposite one as the coin suggests, Augustus built a triumphal arch. This arch was aligned with via Flaminia, but after passed under the arch the road would turn right and climb some 6 meters above gradually (10% of slope) with 60 meters of length, on the opn posite side of the bridge it would turn to the right again and reach the level of the roman Via Flaminia which was unearthed by archaeological excavations on both sides at 1.5 meters below the actual street level (Virgili, 1983), (Virgili, 1985). With the demolition of the last arch the ramp was dismantled and eventually also the triumphal arch. The bridge was repaired several times in the following years but mostly using wooden structures to connect it with the Flaminia on the southern side, this structure worked as drawbridge and could be interrupted in case of an invasion from the North (Ciotta, 2007). On the other side the ramp instead survived and is clearly visible in many images (fig. 4, 5).

Shifting point attractors

Shifting point attractors is introducing a new type of attractor to explain this transformation of the roads approaching to the bridge on both sides. The diagram illustrating the double central symmetric flexus of via Flaminia and Via Clodia is visible in the picture (fig. 12) and suggests that there were two lateral ramps connecting the level of the road with the upper level of the bridge. The length of 60 m of these ramps seem to comply with a raise of about 6 metres, and a slope of approximately 10%. The demolition of the ramp on the northern side is documented during the restoration accomplished by Valadier in 1805. We are here considering the hypothesis that the other ramp was demolished in the wake of the battle of Ponte Milvio which happened on October 28th 312 AD. The day before Constantine had the famous dream with the vision of the cross "in hoc signo vinces". According to one of the sources (Svetonius, De vita Caesarum, XXX; Palombi, 2011, p. 85) in that time Maxentius to defend Rome from the approaching armies leaded by Constantine the great, demolished the last arch of the bridge towards Rome, and therefore the ramp, replacing it with a wooden structure so to cut off the enemy. He then committed a mistake by placing himself before this interruption and when Constantine approached he was pushed back along the bridge which did not hold the weight. Falling into the river and dying, Maxentius and his troops lost the battle, and as a consequence Constantine became the sole emperor of a newly declared Christian Roman Empire. Nevertheless, looking at the Gregorian cadastre, dated 1816, we can reconstruct the diachronical sequence of the entire transformation, with the position of the two side ramps, one of which is documented so its position and demolition is certain, while the other one is for now hypothetical. The Via Flaminia was eventually rectilinear all the way to the end of the ramp, where most probably stood the Augustus triumphal arch acting as the *meta* of the road.

The property division is orthogonal to the streets in the different road parts, and still is. In 312 AD the arch and the ramp were demolished, and in the subsequent times the road was reconnected with the new entrance forming the flexus: along this new restructuring route the land division followed a rotated orthogonal direction (Caniggia and Maffei, 1979). On the opposite side of the bridge, via Clodia, Flaminia and Tiberina were all aligned with the entrance of the side ramp. The transformation designed by Valadier deviated all the roads so to reconnect them with the new design of Piazzale Ponte Milvio.

Following this hypothesis, the central symmetric configuration of the flexi on the two sides of the bridge is the consequence of the central symmetry of the ramps: after the ramps were demolished the roads were attracted consequently. Surprisingly, photographical documentation provided by the Soprintendenza of unsure position, but described in the caption as "Via Flaminia, Ponte Milvio" , have shown the Roman stone paving of via Flaminia at a level of 1.5 m under the street level (Virgili, 1983).

Below the road several masonry walls with a different orientation forming an angle

with the axis of the road were revealed. This substratum seems to confirm our hypothesis, when this new road was designed and paved it was superimposed on an existing urban tissue, restructuring the grid and determining the angle with the lower substratum. Other excavations along the river side have shown what has been interpreted as part of the river quay, even though it could be the remains or the foundations of the above mentioned ramp (Palombi, 2011), (Virgili, 1983). The level of the finding is -1.5 m consistent with the Roman street level, and the stonework construction with connecting bronze elements resembles closely that of the ramp of *Pons Aelius*, which was unearthed during the construction work of the Lungotevere. All the Roman bridges had ramps, but this one had orthogonal ramps instead of parallel ones. August built his triumphal arch attached to *Pons Milvius* in 27 BC as a twin arch of another at the opposite end of the road in Rimini, and today still standing. A silver *denarius* from the times of Augustus shows what has been interpreted as Pons Milvius, with the two triumphal arches at the ends. Even though the coins usually provide an idealised picture of monuments, this image suggests, as it shows the side, that the triumphal arch was a quadrarch and was placed at the end of the ramp aligned therefore with Via Flaminia.

The application of the attractor theory to the study of the evolution of urban form can provide further means of understanding, in this case if could provide a solid hypothesis regarding the evolution in time of the routes approaching to Ponte Milvio from either side.

Figure 1. (right) Pietro del Massaio, View of Rome, from Ptolemy's Cosmographia, 1471, Biblioteca Apostolica Vaticana, Ms. Lat. 4802, fol. 133r;

Figure 2. (left) Bartolomeo De Rocchi, Studio per l'acesso al Vaticano dai Prati attraverso la via Angelica, 1560-1561, Gabinetto dei Disegni e delle Stampe degli Uffizi, Firenze, UA288r.

Figure 3. A. Chiesa, B. Gambarini, C. Nolli, G.B. Piranesi, Pianta del corso del Fiume Tevere, e sue adiacenze, Rome, 1744 , ASR, Disegni e piante, Coll. I, Tevere, cartella 119, n. 26 (detail: side elevation of Ponte Milvio).
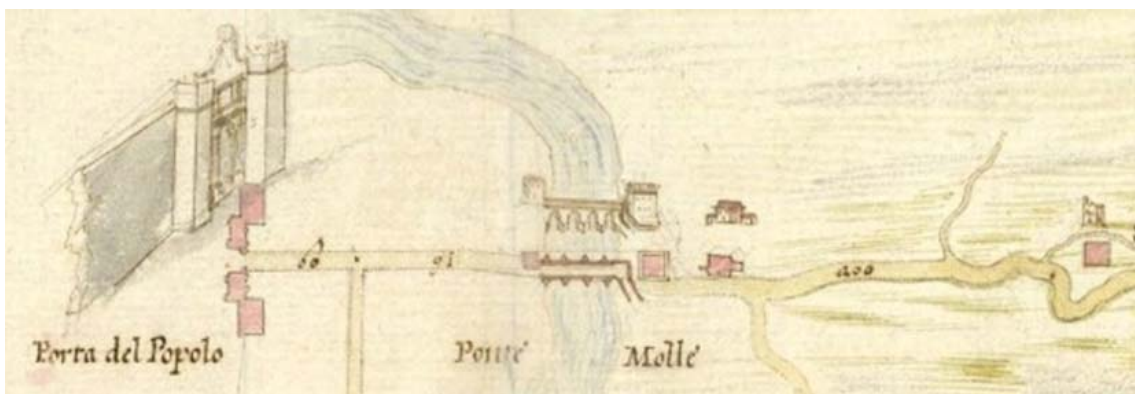
Figure 4. Sviluppo della strada fuori di Porta del Popolo da Roma sino a Viterbo, ASR, Presidenza delle strade, Catasto alessandrino, 433/V, 1660 (detail).

Figure 5. (right) Gian Battista Piranesi, Veduta del Ponte Molle sul Tevere due miglia lontan da Roma, Vedute di Roma, Tomo I, tav. 54, Firmin Didot Freres, Paris, 1835;
Figure 6. (left) Giovanni Battista Piranesi, Pianta di Roma e del Campo Marzio, Vedute di Roma, Tomo I, tav. 1, Firmin Didot Freres, Paris 1835.
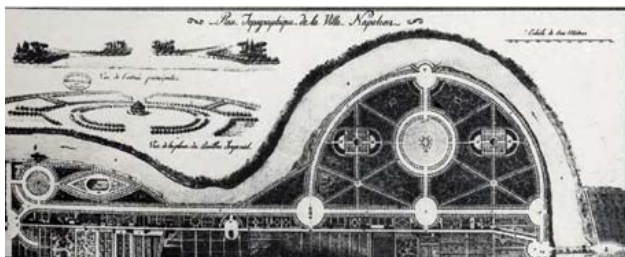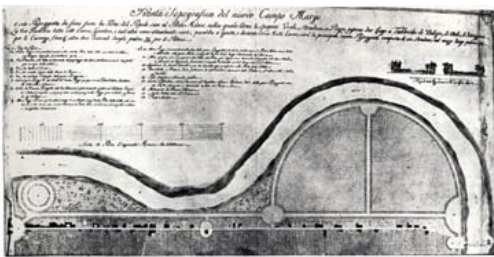
Figure 7. (right) Giuseppe Valadier, Pianta Topografica del Nuovo Campo Marzio, 1805, BIASA, Coll. Lanciani, Roma, XI,100/2, n. 87;
Figure 8. (left) Giuseppe Valadier, Pianta Topografica della Villa di Napoleone, 1809.
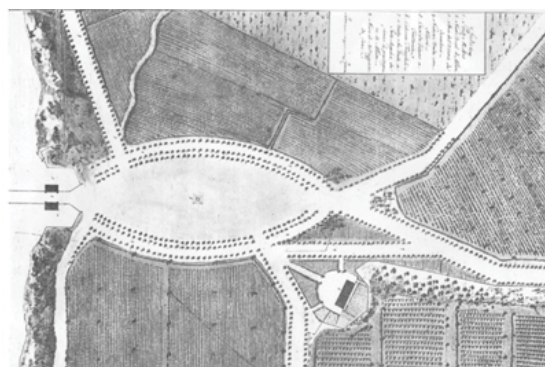
Figure 9. (right) Giuseppe Valadier, Planimetria della sistemazione della Piazza di Ponte Milvio, 1805;
Figure 10. (left) ASR, Catasto Gregoriano, Agro Romano, 153, Via Flaminia prima di Ponte Milvio, 1816.
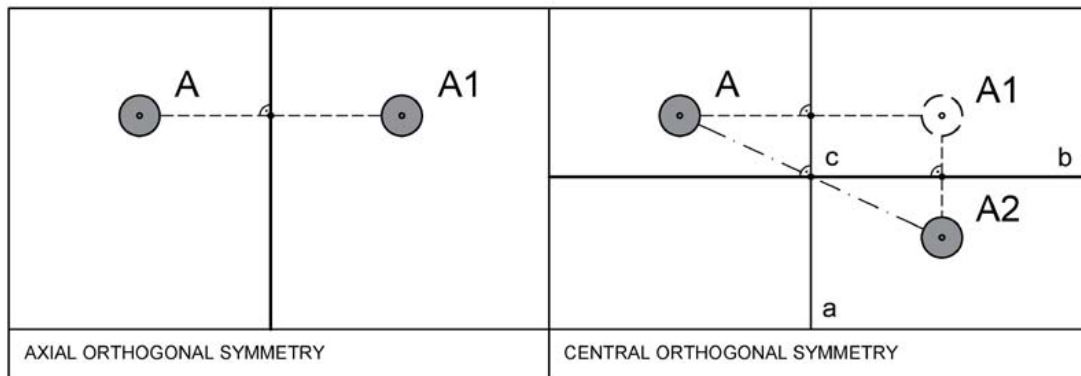
Figure 11. Plane symmetries: orthogonal axial symmetry (left); orthogonal central symmetry (right), (Camiz, 2020).
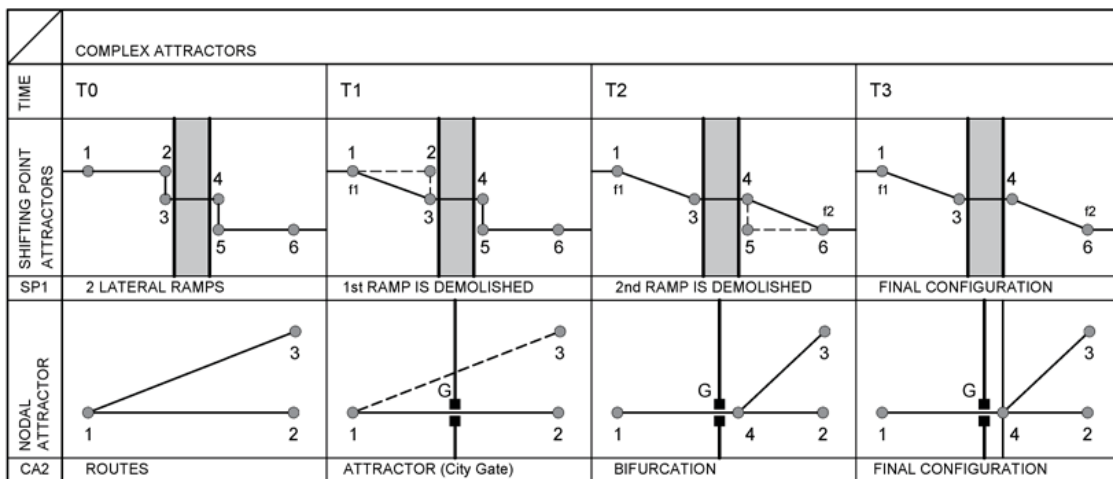
Figure 12. Shifting central symmetric point attractors (bridge with lateral ramps); nodal complex attractors (city walls and gate), (Camiz, 2020).

Figure 13. Guido Achille Mansuelli, outer elevation of Augustus' arch in Rimini, 1942 (left); *denarius argenteus*, Augustus, "QVOD VIAE MVNITAE SVNT", private collection, (right).
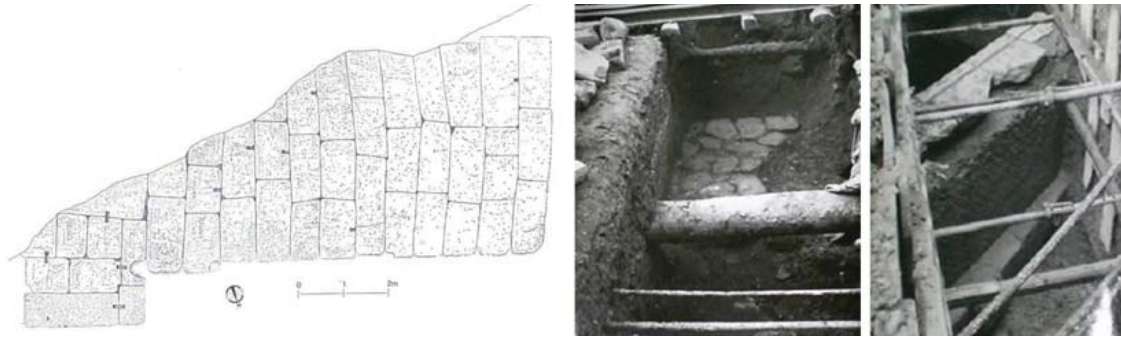
Figure 14. Remains of the river quay at the Milvio bridge, (Virgili, 1983) (left); Via Flaminia, Ponte Milvio, stone paving of the roman road, and masonry constructions with a different orientation in the lower layer, (right).

Figure 15. The ramp of Pons Aelius (Ponte S. Angelo) being demolished during the construction works for the Tevere's embankment, 1890 ca.
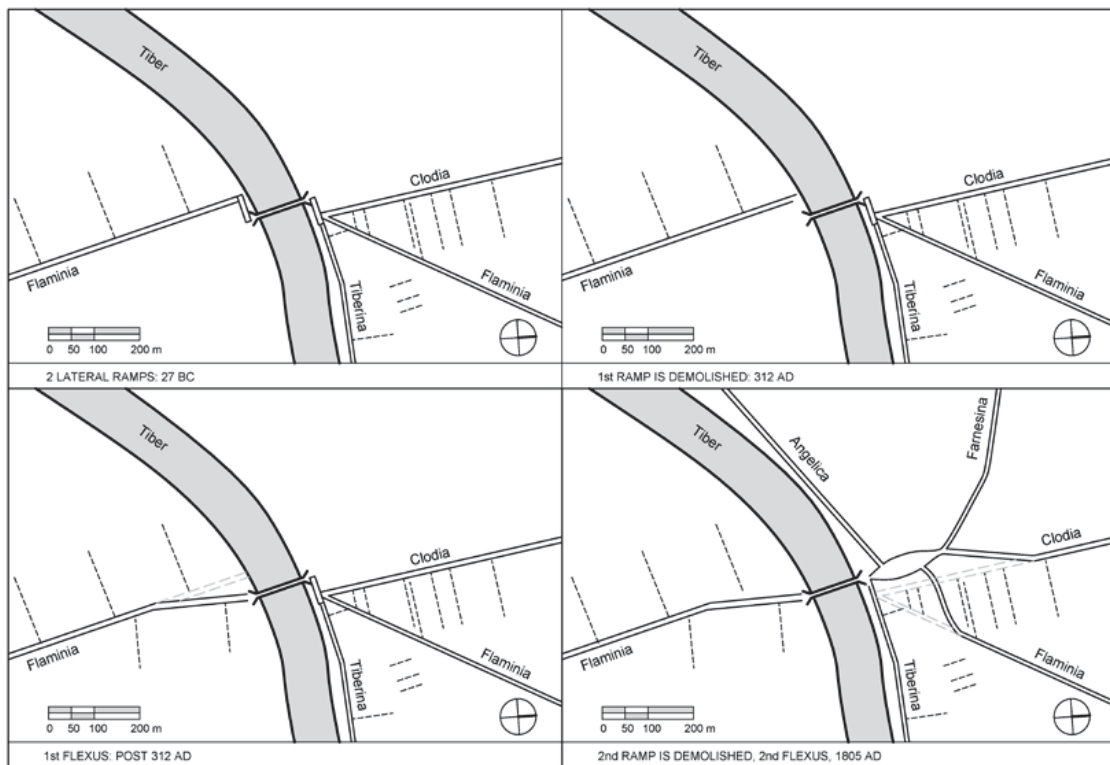
Figure 16. Diachronical sequence; 1) lateral ramps (27 BC); 2) demolition of the first ramp (312 AD); 3) first flexus (post 312 AD); 4) demolition of the second ramp (1805 AD), (Camiz, 2020).

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Urban aesthetics: the Haussmannian urban form and the configuration of the city of Erechim/RS, Brazil.

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Abstract

The city of Erechim, in the state of Rio Grande do Sul came about from a planned process, based on an urban plan resulting from the positivist ideas of Civil Engineer Carlos Torre Gonçalves, which was influenced by the already consolidated city of Paris, France. With this, this article seeks to analyze the historical context that resulted in the conception of the urban layout of Erechim and a comparative reading between the urban morphology of the municipality with the city of Paris, in France. The tracing of the urban fabric, extremely striking in both cities, becomes an important and historical legacy to understand the evolution of a city. The methodological procedures refer to an exploratory research typology of qualitative nature. Initially, bibliographic research was developed through secondary data in theses, books, and dissertations. Primary data were also collected, mainly in the Erechim Historical archive, fundamental to support and understand the research. In the comparative analysis, it is concluded that the similarities between the planes are mainly in the inducing axes of all urban thought, outlined by the roads that prioritize the circulation. The differences between them pointed to the layout of Paris as an influencer, not a fully replicated model in the Erechinese lands.

Introduction

The city of Erechim, located in the north of Rio Grande do Sul, has a population of 96,087 thousand, according to the 2010 IBGE census. In the state, the municipality is ranked 19th among the most populous cities (IBGE, 2019).

Recognized for its large, main avenue with central tree-lined flower beds, Erechim had its urbanistic principles conceived in a planned way, as a result of the positivist ideas of Civil Engineer Carlos Torre Gonçalves (PEZAT, 2003),

the city stands out for the urban layout of the blocks, strongly composed of straight lines that were repeated forming a well defined urban fabric by the square or rectangular geometric shapes (FÜNFGELT, 2004; BIANCHINI, SANTOS, CAVALCANTI, BRESOLIN AND CIOTTI, 2008).

Influenced by the composition of the city of Paris, the creation of the urban planning of Civil Engineer Carlos Torres Gonçalves positioned on the wide central avenue that crosses the city on the north and south axis, a square, and a landmark of the city, in which It is still located today, the political, administrative and religious center with the city and church buildings. In this label of central and striking monumentality, also crosses two other axes, ie two ways, which gain strength, further glimpsing the reference of the city of Paris (FÜNFGELT, 2004; BIANCHINI, SANTOS, CAVALCANTI, BRESOLIN AND CIOTTI, 2008).

Given this, this article seeks to analyze the historical context that resulted in the conception of the urban layout of the city of Erechim, in the state of Rio Grande do Sul, and comparative reading between the urban morphology of Erechim - RS and Paris, in France.

The historical survey was necessary to understand the evolution of the processes that occurred in the period, resulting in the conception of the urban plan for the city of Erechim. Thus, the time frame is limited to the description of the beginning of the Erechim Colony, in 1904 with the demarcation of the land division, following until the delivery of the plan by Carlos Torres Gonçalves in 1914. It should be noted that after the delivery and execution of the At the urban level, the city continued to evolve and expand its territorial area, but what is sought in this study is to visualize the urban layout proposed at the time.

This layout of the urban fabric can be seen even today in the city, which becomes an important and historical legacy to understand the entire evolution of the municipality. For Fünfgelt (2004), urban memory must be preserved as a way to ensure that the identity of the city, be it cultural or social, is built from the essence formed by the roots of the past.

As for the methodological procedures, this article deals with a typology of exploratory research, of qualitative nature. This type of study with a qualitative approach is described by Minayo (2011) to explore existential aspects, their meanings and the occurrence of phenomena through observation of facts. As for the exploratory typology, Gil (2002) justifies as a description of characteristics of a given phenomenon. Thus, this research was selected as a way to understand the conceptions of the outline proposed by Carlos Torres Gonçalves and thus further explore the subject. As for the data, bibliographic research was developed through secondary data in theses, books, and dissertations, as well as primary data from the Erechim Historical archive, which were fundamental to support and understand the research in the description of this article.

Urban evolution of cities

For Santos (1997), urban space can be compared to a residence, which in this case is formed not only by objects but by a sum of elements, being nature, people and objects that, together with the other spaces form the residence. This also occurs in the urban space formed by more than one element, such as streets, houses and public spaces that together form the city, the essence of social space.

For Lefebvre (2001) the city was never static, on the contrary, it is a set of constructed elements that relate to the existing society and over time build a history. Thus the author characterizes the times and changes over time, explaining that when society changes, the historical context of the city also changes.

For Fünfgelt (2004) these transformations are perceived in the landscape, which changes and sometimes is reconstructed leaving fragments of history or eliminating them.

factors that make individuals agents from whom planned actions operate shaping the conformations of space (LEFEBVRE, 2002).

Corroborating this context Fünfgelt (2004) points out that society, besides transforming space, suffers the inverse process, that is, it is also transformed from space, is a mutual process of continuous exchange during the historical walk of the city, for example. often overlapping layers formed by different moments that are drawn in history and leave the marks urban memory.

Thus, the memory is not only made by the urban buildings introduced in the layout of the city but in the daily lives of the population, in the customs of society and the form of appropriation of public spaces (FÜNFGELT, 2004).

However, there is a lot of neglect on the part of public administrators and the population itself that over time has considerably destroyed important historical elements of cities, losing significant values to the city's urban memory and imposing new precepts due to a discourse of progress and modernity (JEUDY, 1990).

In his statements, Jeudy (1990) clarifies that it is necessary to demystify the fact that preservation nullifies progress so that there must be advances, new conformations, but without abandoning everything that already exists. Preservation should be a joint effort of society and public power to appropriate the city from its cultural meanings that are important and necessary as they are physical testimonies of the system of use, experiences and historical accounts. It is these time-persistent cultural manifestations that will allow future generations an indispensable cultural knowledge within the evolutionary process of cities.

The statements of Fünfgelt (2004, p.6) further emphasize the importance of preserving themselves, since "the memory of the city is also the memory of its inhabitants". Thus preserving the past is the possibility of exposing in the present a cultural reference of memory.

Urban morphology of Erechim- RS

The beginning of the Upper Uruguay Gaucho region occurred from the demarcation of lands, more precisely in the year 1904, along with the opening of the railroad that connected São Paulo / Rio Grande. The railroad, which started in the city of Santa Maria in the state of Rio Grande do Sul, cut the state allowing the connection of southern Brazil with the other states of the country (FÜNFGELT, 2004; BIANCHINI, SANTOS, CAVALCANTI, BRESOLIN AND CIOTTI, 2008).

As the railroad construction progressed, the new stations emerged. This attracted immigrants to the vicinity so that they would progressively give rise to small settlements. To prevent the invasion of squatters, at the same time the official government agency prepares the division of rural lots supporting immigrants (FÜNFGELT, 2004).

Decree 313, dated July 4, 1900, defines an area of 25 hectares for each household, including the tools necessary for cultivation work, establishing a grace period of up to five years for debt to be repaid. Thus, the plots with a size of 25 by 100 meters were divided between the total colony of the colony, taking as reference the existing topography and watercourses (BIANCHINI, SANTOS, CAVALCANTI, BRESOLIN AND CIOTTI, 2008).

This is how the Erechim colony was born. In figure 01, dated 1913 the representation of the division of land between the plots of the colony demonstrating the divisions in sections and lines. In addition, this division already provided area reserves for future occupations (FÜNFGELT, 2004). Thus, in the government of Calos Barbosa, the Erechim Colony was established on October 6, 1908 (BIANCHINI, SANTOS, CAVALCANTI, BRESOLIN AND CIOTTI, 2008).

Through the surveyor engineer named Severiano de Souza Almeida, who carried out the demarcation of land, the headquarters of the colony was initially established near km 110 of the railroad track (BIANCHINI, SANTOS, CAVALCANTI, BRESOLIN AND CIOTTI, 2008).

This place, where the municipality of Getúlio Vargas is located today (Figure 02) was then far from the center of the colony. Even so, in 1909, the first buildings were already being built at the headquarters, with the office of the land commission, award, a wa-

the land commission required a new study to be carried out to redefine the colony headquarters in a region closer to the station (FÜNFGELT, 2004).

With an initial population of 36 settlers, thirst grew considerably over time. In 1911, the colony already reached the population number of 10,000 people, coming from the most diverse nationalities, being mainly Italian, German and French (DUCATTI NETO, 1981). In the year 1912, the housing number reached 14,687 people (BENINCÁ, 1990).

Just as the region of the colony's headquarters grew significantly, the construction of continuity to the railroad sections grew together. From 1909 to 1911, the Erebango, Capoerê, Paiol Grande and Barro stations were established. Together with the stations, small population groups formed that occupied the areas adjacent to the railroad (FÜNFGELT, 2004).

Even in 1912, in view of the current growing movement of immigrants, the Erechim colony was becoming increasingly prominent in the state, but the initial location of the headquarters, due to the need to settle quickly to meet immigrants, was poorly planned, without previous and distant study of the railway (FÜNFGELT, 2004). With that, the discussion of readjusting the headquarters to a new location is resumed, and the government, indicating a more favorable and adequate position for the headquarters, opts for a location near the village of Paiol Grande, which had the railway station (BIANCHINI, SANTOS, CAVALCANTI, BRESOLIN AND CIOTTI, 2008).

With this context, the government decided to move the colony's headquarters to the village of Paiol Grande (Figure 03), which, in addition to the proximity to the railway, had other positive factors for the installation of the headquarters, such as being " (...) located in the central region, in a bello chapadão, the highest point of the vast region of the southern plateau (...), being the highest mountain station of the state network, with 768 meters "(KARNAL, 1926).

The news generated many expectations among the population that requested for new lots for production. The area of 2,300 hectares would be 50% parceled to lots. Therefore, the new headquarters was in charge of the Land Commission, which was located in the city of Passo Fundo and planning took a long time to be finalized (FÜNFGELT, 2004).

Erechim colony reached 18,000 inhabitants in full development in 1913. Agricultural production allowed families to support themselves and the conclusion of a bridge between the state of Rio Grande do Sul and the state of Santa Catarina, in the region near the colony, became an even greater facilitator in the coming of immigrants from other states (FÜNFGELT, 2004).

Amid the government's confirmation that the new headquarters near the station should be moved until the installation of the plan for what is now the city of Erechim begins, the new buildings were forbidden to be built to prevent this from altering the planning in progress. Even so, the small village of Paiol Grande already had 41 wooden houses and 20 commercial establishments (BIANCHINI, SANTOS, CAVALCANTI, BRESOLIN AND CIOTTI, 2008).

The delay in setting up the new headquarters of the Erechim Colony meant that the new immigrants arriving there were housed in a shed, subdivided between dormitories and a hall, specially built to house foreigners before moving to the colony headquarters. still in the vicinity of km 110 (FÜNFGELT, 2004).

The planning of the new headquarters resulted in complaints due to the late delivery of the project, being justified by the Chief of the Directorate of Lands, Civil Engineer Carlos Torres Gonçalves in the face of the project revision, inserting the necessary adaptations for the referred installation site (FÜNFGELT, 2004).

Engineer Carlos Torres Gonçalves, a member of the Land Commission, was responsible for preparing the project for the colony's new headquarters. Carlos Torres Gonçalves graduated in Civil Engineering from the Polytechnic School of Rio de Janeiro in 1898 and has since then acted according to positivist ideals (PEZAT, 2003).

Thus the headquarters of the Colony was a planned project, unlike the other places that grew in a disorderly way. Thus, in 1914 Vila received and implemented the project that conforms to its central urban structure to this day (BIANCHINI, SANTOS, CAVALCANTI, BRESOLIN AND CIOTTI, 2008; FÜNFGELT, 2004).

Carlos Torres Gonçalves's planning

The urban plan of Engineer Carlos Torres Gonçalves for the new headquarters of the Erechim colony was conceived as appropriate to the legislation that regulated the state colonies at that time, through Decree No. 247 of August 19, 1899 (IOTTI, 2001).

Within the decree, two articles were guiding, art. 5º designated an area divided into two identical zones, being separated by a 20-meter wide avenue. Already Art. 6 established a central reference point for the village, such as a square, so that adjacent lots would have a preference for schools and public buildings (IOTTI, 2001).

Thus, and following positivist ideas from which the engineer believed and spread the guidelines planned by Carlos Torres Gonçalves, they were based on rationality and order, strongly influenced by the route that Haussmann proposed for Paris (FÜNFGELT, 2004).

It was expected to occupy 15,000 inhabitants, divided among 2,500 lots, and already projecting a future territorial expansion. With rectilinear tracing, the checkered mesh resulted in blocks of homogeneous dimensions (Figure 04). From the central avenue, formed by a square called at the time Christopher Columbus Square (now Flag Square), overlapping diagonals that cut the checkered mesh modify the monotony hitherto regular (FÜNFGELT, 2004).

To the east, the larger farms already demonstrated a sequence of the planned straight line along with the expansion. Farms could be fractional in the future, meeting a demand for more lots. To the west, the description "area for future development" demonstrates the growth vision that could occur, but there is no installment design within the proposal (FÜNFGELT, 2004).

On the sides of the square, it was foreseen the installation of the political, administrative and religious center (Figure 05), materializing with the city hall, the cathedral, the forum and the building of the "Land Commission" (FÜNFGELT, 2004) that until Today it is a historical landmark in the city, popularly called "Castelinho".

Planning is anchored in road layout as the main function of city circulation. Eight squares were planned, by the central axes, creating perspectives from vanishing points. The lots had a minimum size of 1,250 m² of the area determined by the Government. The railroad did not interfere with the route, there is only a fragmentation in the area of the railway, followed by the same route after crossing the limits of the train route. The blocks along the railroad margins were adapted to the curves of the tracks, in addition to tracing an avenue adjacent to the entire railway extension within the urban boundary (FÜNFGELT, 2004).

The main avenue north/south was further divided with a square. All axes received the nomenclature of avenues, thus extolling these roads of greater importance and dominance over other streets (FÜNFGELT, 2004).

The urban layout was conceived from the principles of horizontality, and it remained this way until the 1950s (Figure 06). After this period, more precisely between 1960 and 1980 verticalization gained strength in the urban environment (Figure 07). The intentions were to show a developed city based on what the major centers were projecting in this period (CHIAPARINI, SMANIOTTO, FÁBRIS AND HACHMANN, 2012).

Urban planning analysis

Graduated from the Rio de Janeiro Polytechnic School, where he approached the positive ideals, Carlos Torres Gonçalves not only believed but lived the guidelines of this current profoundly, both in his public actions and in his private life (PEZAT, 2003). It should be noted that this same school also graduated two important engineers who worked in Brazilian cities, making different plans, one of them Aarão Reis who came to design the city of Belo Horizonte, also following the positivist ideals and Saturnino de Brito (FÜNFGELT, 2004).

Given its plan of urbanization of the Erechim colony, it is clear that the axes, that is, the roads are strong and influential elements in the layout, becoming the starting point of the planning (Figure 08).

The rectilinear lines forming squares are replicated on both sides of the main axis. It is interesting to note what the author Fünfgelt (2004) concludes in her studies, and Torres Gonçalves justified the delay in the project delivery due to the changes that were made

to suit the terrain topographic situation, however, this principle was not met as necessary, since he inserted the checkered mesh over the physical territory thus imposing a fixed stroke without considering the contours.

It may be that the adaptations according to the site, as described by Torres Gonçalves only referred to the adjustments to the railroad margins, which in turn was limited to the layout he was proposing. Figure 09 shows that the blocks adjacent to the railway route were adapted, acquiring different shapes to checkered mesh. Even so, the following courts already take up the principles of maintaining regularity and form.

Comparing with the urban layout of the city of Paris, France, source of inspiration for Carlos Torres Gonçalves we can highlight some relevant aspects. Initially, both Paris and Erechim, have well-outlined axes, marking the landscape and creating a focal point. In this case, Paris is located the Arc de Triomphe and in Erechim the Place de la Flag. In this respect, it is also worth highlighting an important and central element of Praça da Bandeira, a fountain that is still present today.

In Paris, the centrality is cut by six axes, being noticeably a major and larger one, connecting with other centralities. In Erechim, there are only three axes, one major main and two other diagonals. It is possible to consider two more axes perpendicular to the main axis because they also cut the central element, but these axes are of minor importance and do not stand out like the others in the landscape.

Another important and distinct aspect between the planes is the shape of the blocks adjacent to the axes (Figure 10). In Erechim, Carlos Torres Gonçalves imposed straight lines forming rectangular or square blocks that differ only in size. With the axes, some of them were split into two, cut in their largest direction resulting in two triangles that remain with straight lines configuration. As previously described, the only blocks that suffered the most adaptations were blocks near the railway line.

In Paris, the scenario is different. Even if in squares split by the intersection of the axes, it is clear that the geometric shape does not follow a repetitive and sequential pattern. Lines are generally straight but result in distinct geometric shapes with many facets. Also, on some axes, a slight angle is noticed resulting in a more organic line.

Conclusion

Carlos Torres Gonçalves left an important legacy in the colonization mainly of the northern region of Rio Grande do Sul. His participation in the public positions he held in the state was significant, including his assiduous and constant role in the urbanization of the unoccupied lands. Torres proposed and built roads, bridges, urban settlement plans and other public works (PEZAT, 2003).

Understanding the historical process of the construction of the first ideas of the city of Erechim given its urban transformations that occur to this day, are striking features at the local level and return to the subject of preservation in the face of historical facts that must be remembered. Urban memory is part of the city, being an element formed by different layers, sometimes overlapping, but seeking to understand the initial forms of conception.

When comparative analysis shows that some important similarities such as the fact that the axes are inducers of all urban thinking, outlined by the routes that prioritize circulation and endowed with a dimension that allows the most striking visualization and necessary for its understanding. Similarly, some differences between the two strokes show how the Paris model was influential, and only that. Carlos Torres Gonçalves has created new planning with stroke influences executed in the lands of Paris. It could only have been a fully replicated model in the Erechinese lands, but it was not. Torres somehow created his project. With this, this configuration of the elements leaves in the urban landscape the traces of Torres urban planning.

Figure 1. Plant of the Erechim colony. In the section called Paiol Grande, there is already an urban void. Later, it was in this place, where the new headquarters of the colony was installed. Image Source: Erechim Historical Archive, 2019.

Figure 2. First headquarters of the Erechim colony (now Getúlio Vargas city) in 1912. Image Source: Erechim Historical Archive, 2019.
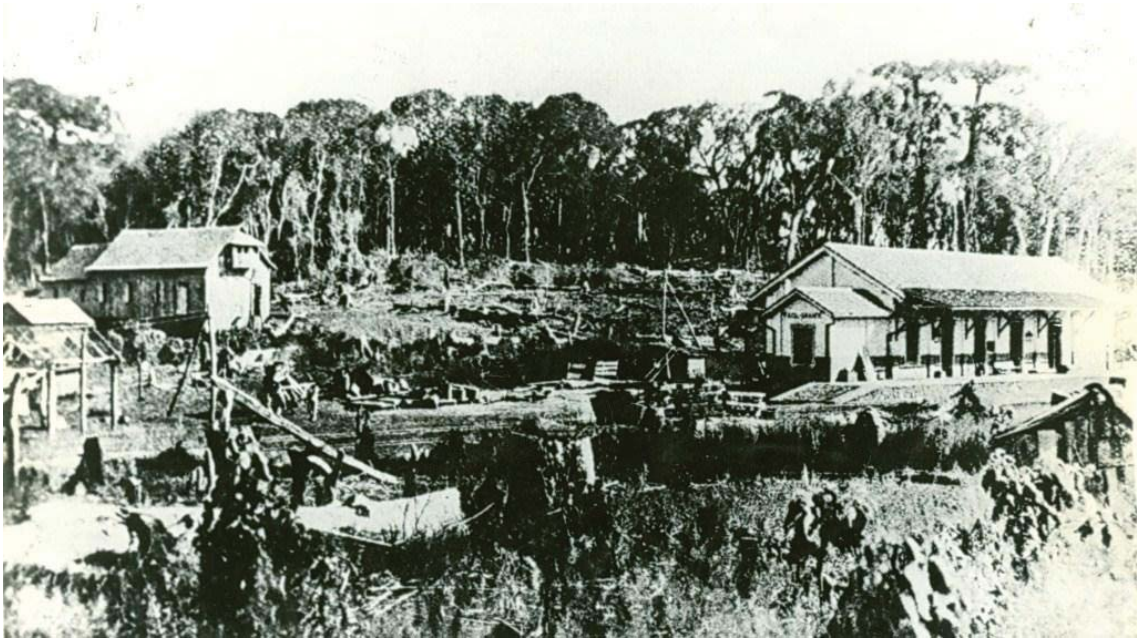
Figure 3. General view of Paiol Grande in 1912. Image Source: Erechim Historical Archive, 2019.
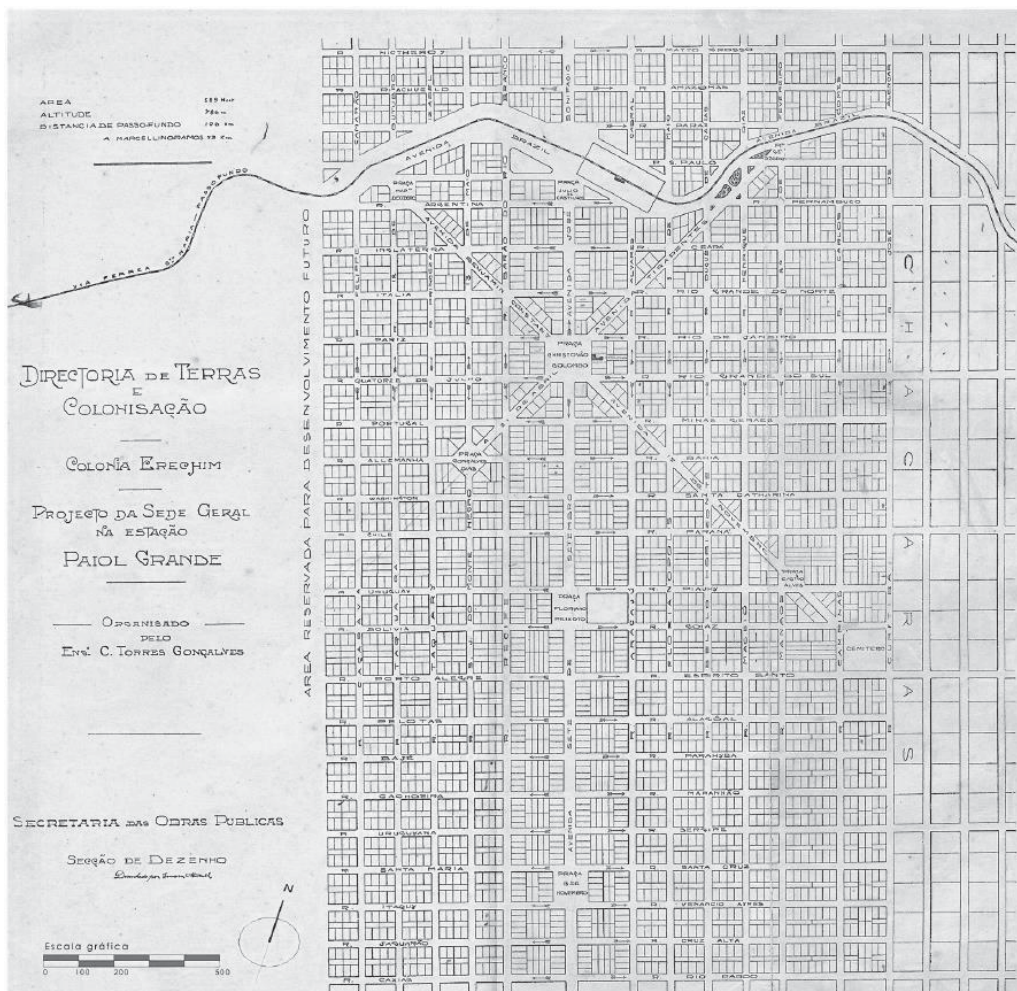
Figure 4. Map of Carlos Torres Gonçalves' proposal for the new headquarters of the Erechim Colony, at Paiol Grande Station. Image Source: Municipal Historical Archive, 2019.

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Figure 5. Boa Vista do Erechim in the 1920s. In the center is built the wooden building of the Land Commission, today, popularly called Castelinho. One can see Flag Square, formerly called Christopher Columbus Square. Image Source: Municipal Historical Archive, 2019.

Figure 6. Aerial view of Erechim, December 5, 1947. Image Source: Erechim Historical Archive, 2019.

Figure 7. Aerial view of Erechim in 1993, indicating the strong verticality of the city. Image Source: Erechim Historical Archive, 2019; **8.** Aerial view of the city dated 1947. Image Source: Erechim Historical Archive, 2019.
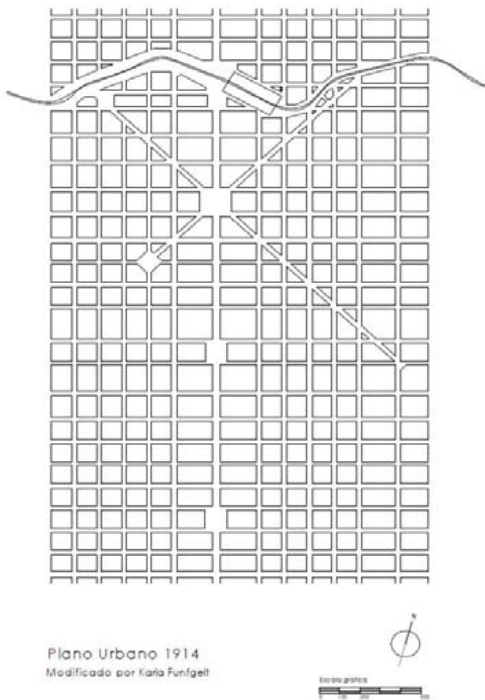
Figure 9. Drawing by Fünfgelt (2004) based on Carlos Torres Gonçalves original plan indicating the strong hierarchy of axes and rectilinear tracing, which resulted in a checkered mesh. Image Source: Fünfgelt (2004); **10.** The first image is an aerial photo of the city of Paris, specifically the region where the Arc de Triomphe is located. The image below, also an aerial view, refers to the city of Erechim, with the centrality of Praça da Bandeia and higher above the region of the former railway station that is currently inactive. Image Source: Adapted by the authors of Google Earth, 2019.

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Coincidentia oppositorum. The building of the urban form in O. M. Ungers

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Abstract

In 1977 O. M. Ungers, with his assistants at Cornell University R. Koolhaas, H. Kolloff, P. Riemann and A. Ovaska, publishes a plan-manifesto about the city of Berlin: "Die Stad in der Stad", in which is expressed a new model of development and composition for the contemporary city: the "city-archipelago". With the aim to reflect about the problems and the issues of the urban form into contemporary, the research group draws up a pro-grammatic plan where starting from the 'given value' of the structure of the urban form deposited by the history and remained, more or less manifest after the bombing, is de-veloped a new concept of city for parts, where each part is enhanced in its 'singularity' and where the green, the space of nature, assumes the role to connect/ untie the same 'singularity'.

The research starting from the analysis of the plan and the theoretical lecture devel-oped into the program-manifesto and focusing on the plans realized for Berlin later by O. M. Ungers, aims at the reflection and the updating of this experience by its re-reading. The confused growth of the periphery, the alienation of the individual into the place in which lives, the necessity to give answers to the form of the contemporary city, are still open issues.

The research of Ungers is focused on the necessity to refound the problem of the form of the city starting from the same architecture, basing on the identification of the substra-tum, modern or ancient it is, looking the architecture as "coincidentia oppositorum" of the contemporary city, giving them form, assuming its complexities and contradictions.

Models/ Archetype. Building for parts

The city is a complex system, testament of centuries of the human's history, of transformations, of a continual leaning to a perfect scheme. But, although the continuous will to build the "ideal city", this has always eluded to the control of the architect-builder of cities, except for the limited experience of the new foundation settlements. The city evolves, changes, answers to the needs of the time by altering from time to time its general physiognomy: "The form of the city is always the form of a time of the city; and existing many time of the form of the city" (Rossi, 2015). The city is an artefact built by parts, where every part illustrates its history, builds its geometries, affirms its singularity, and every part contributes to affirm the whole that it is the image of the city itself. Building the city means to understand its invariant, its form, its history, the process of its architecture, or understanding and affirming every its part. We could deduce that the city is "dialectic" by definition, as Ungers defined it into the essay in 1997, because its evolution is based on an alternate process of harmony and rejection compared to the previous models and canons, on the dialogue with the pre-existed architecture. "The city as synthetic concept has become increasingly disappeared during the history and it is become an enormous device, almost nothing controllable, that always tends to higher growth, perversions and disintegrations. In this inclination to the dissolution of the central city the single nameable places have an important part" (Ungers, 1997). As the etching "The seven church of Rome" by Antoine Lafréy of 1575, the city of Rome emerges through its obelisk and its architectural work, in this way figuratively the contemporary city appear us through its monuments and its significant spaces, symbols and aggregators around which revolve defined parts of the city, parts that we can define again with Ungers "nameable". The city recognize itself in these parts, that represent the "places of lasting form" (Ungers, 1997). There is in this construction for part, in this assembling, overlapping, transforming of the parts themselves, the true *trait d'union* of the urban experience, that connect centuries and spaces. Every city takes from itself, from its significant places, from its elective moments the sense of its transformation, so in the same city must be recognized every possible transformative principle. In this thought, recurring and condensed into the experience of Ungers, there is a deep certainty: that the architecture isn't a process of invention, but it is a discovery, a discovery that starts from the reading and the identification of the experiences of the past city. In an essay about his works he writes: "Architecture doesn't mean inventing but discovering, interpreting with ever new spirit ideas that have long been known, seeing the world with different eyes, living it in a new manner, recovering and reviving it with unusual subjects. Creating architecture also means instilling to the reality an idea, a modified perspective and a different nature" (Ungers, 1991).

There is another way to interpret this fragmentary composition of the city. Its parts aren't only the different urban places, but, as we mentioned previously, also the "singular" buildings can be recognized as concurrent parts that define the overall unity of the urban tissue. The idea of the "city within the city", or the idea of Leon Battista Alberti of the building as a miniature city and the city as a big and complex building, it's a dimensional idea that surrounds from the whole urban form to the construction of the individual building. Two are the architypes into the construction of the theory that Ungers carries on during its architectural work: the Diocletian's palace in Split and, not secondary, Villa Adriana. The Diocletian's palace in Split is emblematic not only for its adherence to the idea of building-city, so symbol of the transformation of the architecture itself in the whole city, as the amphitheatre of Arles or the Lucca's one, but also for the construction of the plurality of the space: a building that contains inside it "architectural landscapes", that have a finitude and a concrete shape, linked together by the whole architectural artefact. This architectural plurality is expressed more evidently by the example of Villa Adriana. The complex could be read as a composition of individual architectures, finished places, settled and connected "dialectically". Every space live independently, it is expressible with its pure and completed form, but with other "architectural monads" contributes to give completeness to the compositive sequence: every part is necessary to each other when we read the morphological ensemble of the opera and the whole appears incomplete if it is deprived of a part.

This idea that we can define of the "finitude" of the part, capable to be singular and choral at the same time, it isn't only a theme that define the construction of the individual building, but it invades overwhelming the architecture of the city too. The architectural design is the instrument through which it is possible to build, what we can define as the "poetry of the fragment", a fragment that is both the finished and the completed part, and the individual tile, "nameable" again, that contribute to define the whole.

Transforming the city. The city-archipelago

This definition of city for parts, or city-archipelago as it will be defined, materialises for the first time in the work of Ungers in 1977. With his collaborators at the Cornell University in Ithaca, as Rem Koolhaas, Peter Riemann, Hans Kollhoff and Arthur Ovaska, he decides to organize the Summer Akademie of the university in Berlin. The theme of the laboratory is the design of an "urban villa", intended as a minimal morphological unit capable of transforming pieces of city. The occasion to work on the city of Berlin allows to Ungers and his assistant to think the reconstruction of urban form after the bombing of the Second World War, and, more generally, about the condition of the contemporary city. In the general plan that is created, the urban structure of Berlin is decomposed into its significant and recognizable parts, in different "urban island", in cities within the city. The image that Ungers and Koolhaas develop in the essay, accompanied by several analytic drawings about the reading of the structure of the city, is a lagoon system, a city-archipelago, where every "island" arises isolated, with its form and its identity, connected with the whole, a part of the "lagoon" itself. The green is an instrument of connection between the parts, as the water that connected the islands, it is the place of the infrastructures, of the open space, of the transience, of the movement, while the parts of the city represent the space of staying, the "stone" face of the city.

The necessity to decompose the city in parts comes from the awareness of the complex and heterogeneous nature of the contemporary city. It isn't possible to reduce it to a unique model of development, as several theories and utopias of the modern tried to do, but it needs to live and work with its polymorphic nature. It follows that the model of the city within the city, or the city-archipelago, turns out to be already inside in what that they call the "differential structure" of Berlin. Obviously, Berlin represents a model for the group of research of Ungers. It is the model of the modern world's capital, with its complexity, its history, with the inability to reduce it to a scheme, to a unique form, with its polycentric nature, multifaceted, witness of the impossibility to grab it in its totality.

But, even if every part arises as autonomous form, these parts can be reduced to elementary morphological schemes (linear city, city-theatre, radial city…). The recognition of categories, of archetypes and references, inside or outside the city itself, is able to transform the chaos of these realties into organised experiences. The design is already into the formal identification, into the assuming of models, into the discovery of new and original meanings. The city is not limited to the mechanical repetition of its copy, or instead, in the constant research of the new, of the different at any cost. The city evolves through the reading of its form. It's paradigmatic as in the work of 1977, Ungers and his assistant don't propose a real and completed design for these different "urban island", but they decide to identify cases that interpret that particular morphological condition: in this way the Unter den Eichen is assimilated to the linear city of Magnitogorsk created by Leonidov, the regular tissue of the Kreuzberg becomes a "Mini-Manhattan" and the radial structure of the Südliche Friedrichstadt becomes an analogous plan of the city of Karlsruhe.

It's possible to close these thoughts and these considerations through the words of Aldo Rossi, when he describes the Analogous City: "[…] I think that the more serious way to work on the cities, to understand them, that it isn't so different, it's is that to put a mediation between the real city and the analogous city. That the latter is the authentic design of the city. […] The real alternative is that to proceed to the construction of the analogous city: in other words, to use of a series of several elements, linked between them by the urban and territorial context, as hinges of the new city. […] the formal analysis is not so much the genesis of the form – genesis that in several cases doesn't exist – but the

analysis of the manner in which these forms are intended and are assumed" (Rossi, 2012).

The city assumed by Ungers isn't only the material with which the city takes shape, but it is the principles, the ideas, the places with which the city is represented. The material remains there, static, and it's only possible repropose it, as it appears. The meaning instead, lies inside the formal question, ready to be caught, modified, expanded. The city, immobile, always equal to itself, and always different, reading through the filter of the contemporary's eyes, has in it the seed of its transformation. Maybe, using again the words of Aldo Rossi, only in this way we can affirm that really the analysis of the characters of the city already represents a design of it.

Enclosing/ Assembling. Two designs for Berlin

Berlin, with its monuments, its structure, its elective spaces, certainly represents a reference model in the work of Ungers. The German architects realizes several designs, competitions, buildings in the capital during his career, but only in few opportunities he experimented the problem and the composition of the urban form as construction of a significant part of the city into the Berlin space. The most important occasion comes during the '90s, when several competitions are promoting for the reconstruction of the capital, united again. In this essay it will be analysed two design: one of the 1995 for the area of the Humboldtkolonnaden and the another one of the 1991 for the area of Potsdamer and Leipziger Platz.

The first design arises in the area of the ancient port of the Humboldthafen, an area that during the competition appeared completely cleared, except for the building of the station Lehrter Bahnof, under construction in that moment. But the site was marked by the elbow drawings by the Spree that intersects at its apex the area of the port, a funnel with a geometrical form perfectly recognisable. These two elements, the station and the river bend, represent the elements by which the design takes its form. In fact, Ungers decides to solve the composition through the construction of two squares: a water square, created by the definition of the harbour basin, enclosed on its four sides by a building rested on pillars and that marks geometrically, with an arching on the façade, the river bend; and the square of the station, an open square, composed by individual elements, that incorporate and assume the directions of the existed building of the station and introducing the building called "cubus", opened on the Tiergarten, and a tower, located in the vicinity of the Invalidenstraße. The design is closed through the construction of a tissue of block buildings and an urban park, that fillet the area with the existed city. Untied by predetermined directions and by a context situation inconsistent, Ungers defines the design working on two elements: the *topos*, or the affirmation of the particular situation of the place, and citing spaces of the historic city, typological and morphological affine. In fact, the reading and the interpretation of the site allows to the German architect to affirm that particularity existed in the area but makes evident by the construction of the architecture itself, and through a specific chooses of language. The construction of the big courtyard building, that surrounds the water square, expresses the force and the potentiality of the architectural form. The building, lying on the pillars, allows to enter, not only materially but visually too, the Spree and the garden of the Tiergarten. The pillars serve as filter between the open space of the park, the space of the station, destined to the movement, the exchange, and the enclosed space of the water square, the space of the staying. At the same time the square of the station is defined by the construction of individua buildings. Every building contributes to define this space and simultaneously is related with its particular situation. In this way, the building "cubus" sees to the Tiergarten, or the area in front of the Humboldtkolonnaden dominated by the presence of the Reichstag, and the tower defines along the axis of the Invalidenstraße an arrival point, it locates precisely the square, and the entire design, on the urban axiality. The station becomes a hinge, a real place of passage, exalting its privileged position. Thesis and antithesis coexist to give to the design, in its geometrical clarity, a variety of spatial experience, joined although different. In this composition of squares echoes the sequence of spaces of Villa Adriana, places enclosed in itself, but that chorally defined a part of the city, enriched by the "particular" value of the *topos*.

The second design is the purpose for the competition for the area of Potsdamer and Leipziger Platz. Differently to the design analysed before, the site is located in an area full of history and references, related to different moments of the Berlin architecture. Leipziger Platz is a square with a well recognizable regular geometric form: a hexagon puts on the conclusion of the tissue of the Federichstadt. This tissue joins to the area of the Tiergarten and the Kulturforum's one. Ungers assumes the urban grid that comes from the Friedrichstadt, he completes it and extends it until the limit of the park. The Leipziger Platz is rebuild into its representative form, defining it as an enclosed square, in opposition to the Potsdamer Platz, generating as an open square that assumes the radial direction that comes from the opposite part of the city. To the grind of the Friedrichstadt, Ungers pulls together the grind defined by the particle tissue of the park of the Tiergarten, rotated in comparison with the first. This invisible tissue, a mark on the ground, is making evident with a "forest" of tower that emerges, casually, now intersecting the blocks that create the urban tissue, now locating isolated. The indifferent continuity of the tissue is interrupted by the presence of this high towers, that "silent" rebuild a hierarchy, previously just mentioned.

These two designs for Berlin of Ungers express, in my opinion, a strong actuality and they could represent a great teaching for the manner with which it's possible to see the city. These his designs have never been an *a priori* definition of an architectural form. The architecture is creating by the place, or in the place are already contained the answers and the questions through which the design takes form. The architecture aims to affirm the *locus*, the will of the place, but it doesn't submit, the architecture exalts it, brings it to the light, it can make visible the hidden trace too, when it is necessary. Transforming the city doesn't mean necessary denying it, and in a historic moment where the city lives in the necessity of a its rethinking, where the value of the object try to dominate on the value of the form, these designs contain in their essence a teaching extremely significant.

Ungers, through these designs, doesn't denying the city, he affirms it through an architecture "sired" to the place but anyway able to build spaces, previously unknown.

Figure 1. "The seven church of Rome" by Antoine Lafréy, 1575.
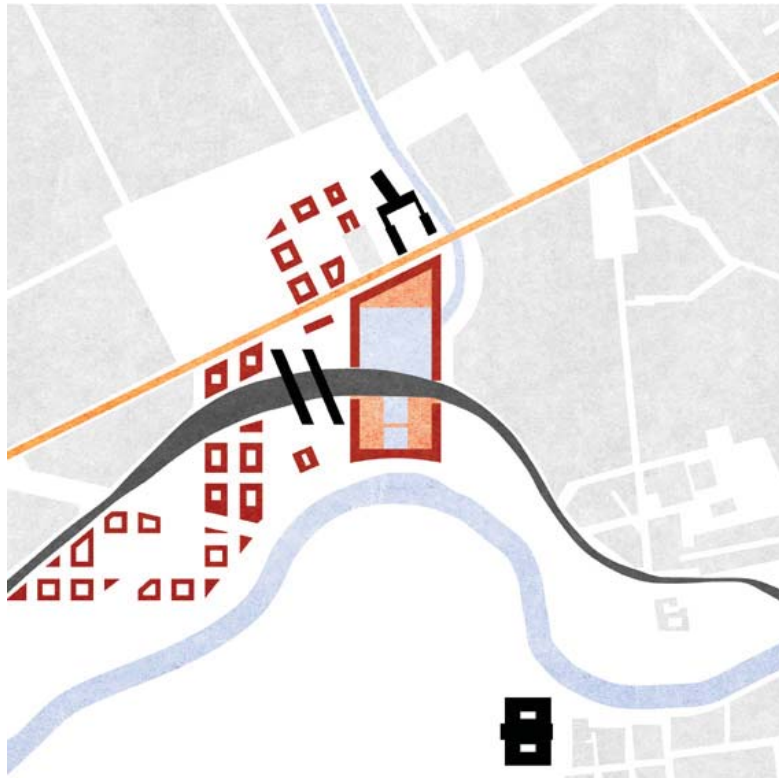
Figure 2. "The seven church of Rome" by Antoine Lafréy, 1575.
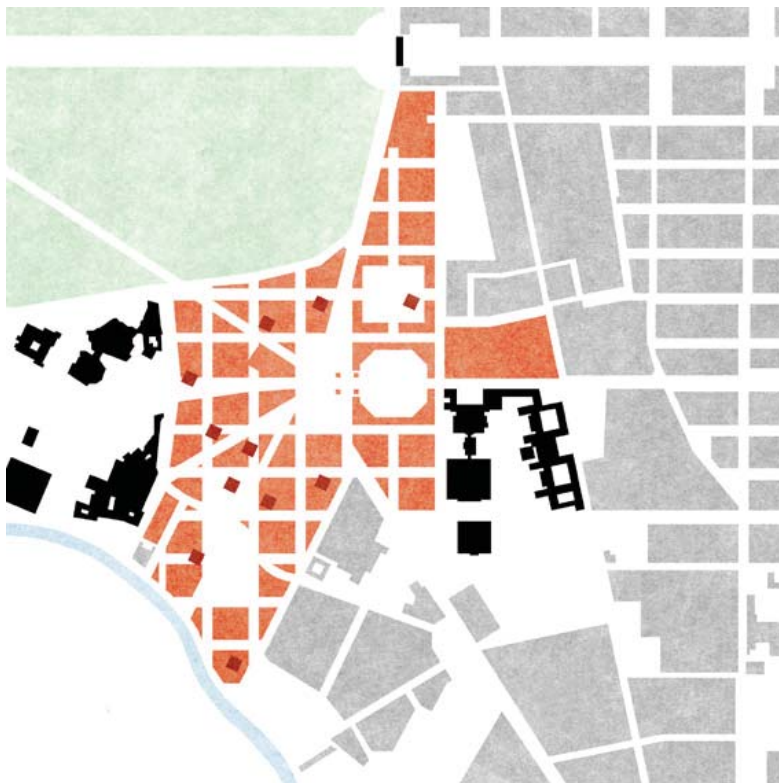
Figure 3. 1991, Potsdamer and Leipziger Platz. Concept.

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An Examination of The Morphological Change of the Roman Main Axis-Case of Adana Turkey

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Keywords: *Adana, Abidinpaşa Avenue, main axis, decumanus maximus, urban morphology*

Abstract

This study aims to examine the morphological change of the Roman main road and the reasons behind the change focusing on 20th century urban development processes. Within this aim Abidinpaşa Avenue in the historic city of Adana/Turkey, which is one of the oldest city axes with a historical background of 4000 years and having a length of 700 meters is chosen for investigation. The Avenue is connecting the Roman Bridge over the River Seyhan with the western city gate and has physical features similar to main axes of the Eastern Roman cities. Due to its multi-layered structure, the avenue, which consists of many buildings belonging to different periods, has changed rapidly due to urban policies and the development processes of the city of Adana in the 20th century and the change has shown its effects on both physical and social means.

The examination was undertaken in three stages. The first stage involved the analysis of the historical development of the avenue using historical maps, drawings and various visual documents. Secondly a morphological analysis was carried out based on the morphological approach developed by M.R.G Conzen within a time span of 80 years (1938-2018). And finally, the change in the spatial characteristics of residential buildings is investigated focusing on two examples using comperative analysis of typomorphology. The study revealed that the street fabric was the least changing feature on the avenue. While the physical form and the length of the main axis has survived, it is ascertained that the development pressure resulted in the construction of higher buildings having contemporary functions. The findings of the study also showed that the typomorphological characteristics of traditional houses can be traced in modern buildings, although the space organization, materials and construction techniques have changed.

Introduction

It is possible to observe various types of historic towns all around the world, while some have survived almost intact and still show unique charasterstics of the period they were constructed, such as Monteriggioni in Italy; some were developed adjacent to the historic city without changing its original features, such as Berlin. Multi-layered towns, on the other hand, embrace remains of several civilizations and very often it is not possible to thoroughly trace the urban structure of previous settlements. Furthermore, it can be argued that combination of previous cultural and urban artifacts make such cities even more interesting and appealing. The Anatolian Peninsula, within this context, is quite rich in terms of the number of existent multi-layered towns, which embrace remains and traces of civilizations that were once predominant in the area. While the urban form and features from historic civilizations enrich the townscape and the spirit of place in such towns, it is also possible to argue that the identification of unique features and understanding of their change in the process is a complex issue.

Morphological analysis, developed by M.R.G. Conzen is generally accepted as the leading method that can be used to understand the processes of change within a historic town, focusing on the street form, land utilization and plot formation (Conzen, 1960). Whitehand argues that urban landscapes embody not only the efforts and aspirations of the people occupying them at present, but also those of their predecessors, which enable individuals and groups to take root in an area (Whitehand, 1981: 18). Since the works of Conzen, urban morphogenetic tradition has evolved into research embracing the transformation of not only the whole town but also neighbourhoods or smaller parts of the physical structure aiming to thoroughly examine distinct features of settlements. Still, such an examination can be undertaken by accessing historical documents, either drawn or written.

Nevertheless, for historic multi-layered towns that no definite and robust records or documents are accessible, morphological analysis has to be undertaken based on written statements or assumptions supported with archaeological research. This study, attempting to test whether morphological analysis can be used in order to understand the change throughout the development process of a multi-layered town, focuses on the city of Adana in Turkey. The city of Adana is in the heart of the Plain Çukurova (Ancient Plain Cilicia), was surrounded with swamps until the end of the 19th century and had a strategic importance for centuries because of being on the coast of the River Seyhan and on the caravan route connecting the northern lands with the eastern civilizations. The earliest settlement in the town was on the western coast of the river and on a land comperatively high in altitude, called Tepebağ. As the town could not be developed towards arshlands, it was not until the beginning of the 20th century that the boundaries of the town could be enlarged (Saban, 2017). As a result of this, all ancient civilizations had to build their settlements on the very same plot and a multi-layered town comprised of different layers of civilizations, starting from Late Bronze Age (Hittite Empire) had been formed (Şahin, 2017: 163-166).

This study, focusing on the multi-layered town of Adana examines the process of change of the main axis believed to have survived from Roman Period, called Abidinpaşa Avenue in the historic town, which is surrounded with organic streets. The examination aims to understand the underlying causes and scope of the process of change in the 20th century, through its most ancient street. Depending on the fact that the town has undergone several changes in urban form throughout centuries, the study area Abidinpaşa Avenue represents features both from Classical times and also from Middle Ages. Therefore the examination intended to explore the extent of the use of methods developed for urban morphological analysis and to identify the level of change within the context of multi-layered cities.

Methodology

The examination was undertaken in three stages. The first stage involved the analysis of the historical development of the avenue using historical maps, drawings, press releases and various visual documents. Secondly a morphological analysis was carried out

based on the morphological approach developed by M.R.G Conzen. And finally, the cadastral map dated 1938, which is the oldest map containing the necessary data for the study area, was evaluated comparatively with the map of 2018 in order to understand the nature of change through the span of 80 years. Furthermore two dwellings survived from different years are also examined typomorphologically in order to discuss the transformation and the processes of specific building types and the multi-layered texture.

Adana as an ancient Roman town and Abidinpaşa Avenue

The city of Adana, is believed to have 4000 years of historical background, depending on the archeological studies in Tepebağ mound which is located in the historic city center (Şahin, 2017). The surrounding mounds revealed that the city of Adana was settled during Hittite Period (Altay, 1966:1) and was also ruled by Assyrians, Persians and Salafis until the Roman Age, which was known as the first golden age of the city when great level of development had occurred (Adana Valiliği, 1991: 25). Although the city carries traces from many civilizations, the most ancient building remains belong to the Roman Empire and that the city of Adana was subject to a prosperous scale of development during that time. Langlois (1861: 343-344) states in his writings about Adana that Emperor Hadrianus had focused on beautifying the city and that during the period he ruled, the city of

Adana strengthened its position. Langlois (1861: 344-347) also indicates that the Stone Bridge, which still exists, was built in the time of Hadrianus, although the inscription with this information has not survived until today. Furthermore, the statements in the Greek inscriptions observed by Langlois during his visit, which are currently exhibited in Adana

Archeology Museum, indicate that the bridge was built by the architect Auxentius.

While it is estimated that city walls, colonnaded streets, temples, odeons, theaters and baths as well as the Stone Bridge were built in Adana during the Roman Period (Hild and Hellenkemper, 1990: 517), it is also argued that a hippodrome was also constructed depending on the statements on an inscription belonging to the 4th Century A.C. (Dagron ve Feissel, 1987: 333). It is also known that River Bath built in 16th century A.C. was constructed on the ruins of an ancient Roman bath (VGM, 1983: 39). Hild and Hellenkemper (1990: 157) argues that Abidinpaşa Avenue starting from the west end of the Stone Bridge may be the Roman colonnaded main axis, where many other physical traces can be followed (Figure 1).

Kostof (1991: 252) defines the main axes in Roman cities as Cardo Maximus (in north-south direction) and Decumanus Maximus (in east-west direction). It was also indicated that these colonnaded streets may be emphasized as one axis in eastern Roman territories and directed to topographic features like rivers, and also known (Stambaugh, 1988: 244) to provide an entrance to the city, from the city gates. Considering the fact that the town of Adana was initially located on top of the Tepebağ Mound, had a prosperous development in the rule of Roman Empire, Abidinpaşa Avenue extended between two city gates -named Tarsus Gate (west end) and Castle Gate (east end)- and connected the western gate with the Stone Bridge over River Seyhan strengthens the idea that Abidinpaşa Avenue is an old Roman city axis called decumanus maximus (Saban, 2017). Furthermore, the discovery of the Orpheus Mosaic dated from the Roman Period in the excavations undertaken in 1964 (Figure 1) supports this idea (Adana Archeology Museum). However, it is not possible to follow the Roman grid in the city, as a result of several disasters that the city had faced and wars occurring in the area. The current street system is organic in form which is believed to have survived from the Middle Ages (Saban, 2017), as there are several cul-de-sacs and shaped according to the topography.

Abidinpaşa Avenue has a length of almost 700 meters with a linear form in the cadastral map dated 1938. The current name was given to the avenue after the completion of the enlargement works (İşisağ, 2019) undertaken by Abidin Paşa who was the governor of Adana in 1881. Although the name of the avenue has not changed since, it was called in various other names in 20th century, depending on the predominant use of buildings. While it was called as Doctors Avenue because of the existence of surgeries until 1950s, the emergence of bank branches caused the avenue to be called as Banks

Avenue starting from 1960s. Today, Abidinpaşa Avenue remains as an important axis with commercial use. Because of its rich history, various buildings belonging to different periods remain on the avenue, which make it possible to observe the multi-layered urban texture (Şahin, 2018).
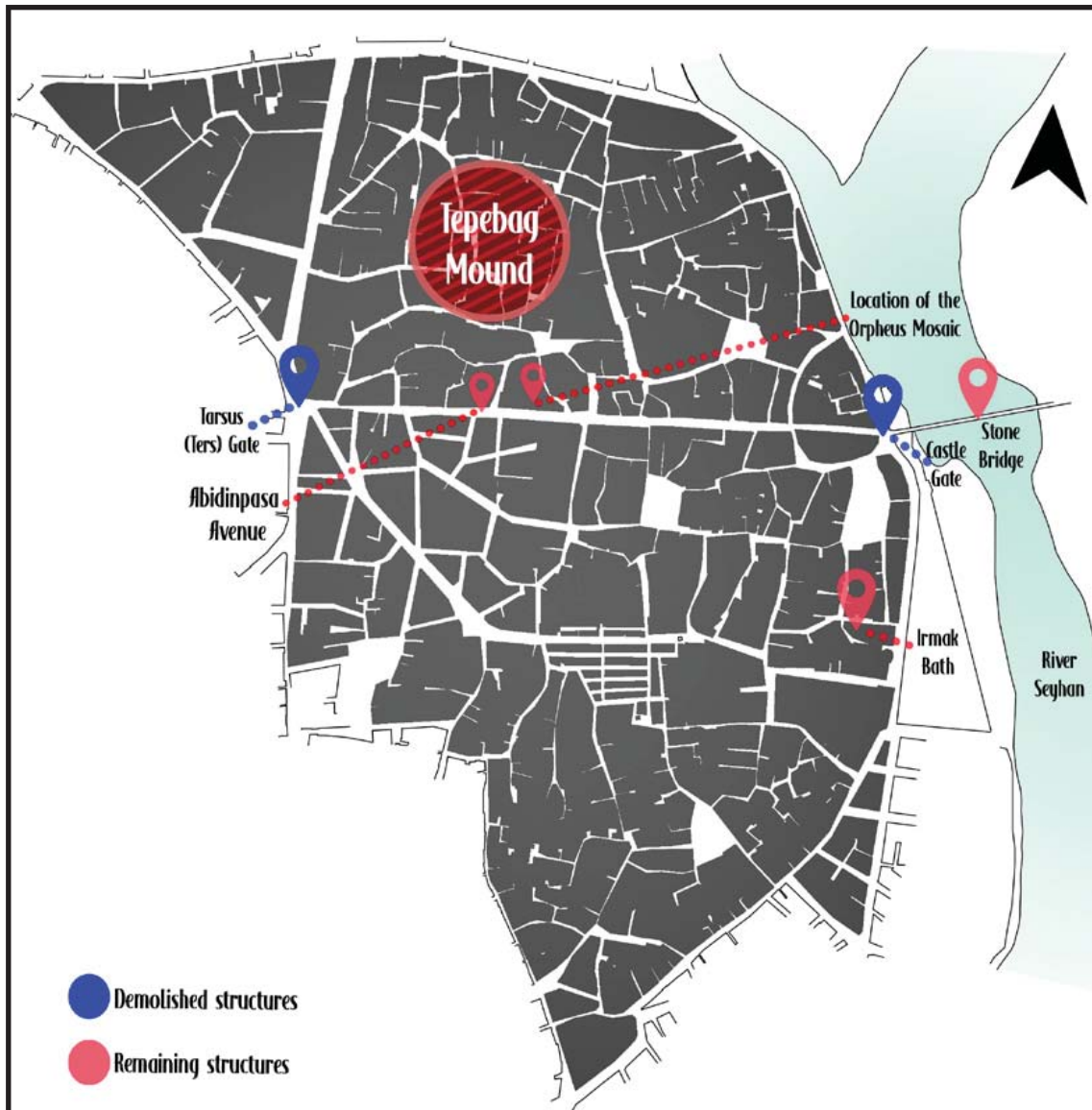
Figure 1. Physical structures survived from Roman Period in Adana City Center on map of 1938 (edited from Saban, 2017:4).

Morphological analysis of Abidinpaşa Avenue

Conzen (1960) defines townscape as the element where the morphological change occuring in an urban space can be observed and the street system as an element of the townscape which is most highly preserved. Urban morphology studies aiming to understand physical transformation of urban space cover various types and levels of urban fabric in differing scales (Conzen, 1960). Within this study, which aims to examine the morphological transformation of the Roman main axis (Abidinpaşa Avenue in the city of Adana) between 1938 and 2018, the study area is defined to comprise the whole of the blocks creating Abidinpaşa Avenue. Street system and the building fabric were examined in the context of the development occured using figureground maps, whereas the building fabric was examined through silhouettes of the avenue in 1938 and 2018.

Transformation of the street system and the building fabric

As indicated above, the prevailing street system in and around the study area has an organic texture similar to traditional Anatolian cities (Aktüre, 1989). The examination of the blocks in the study area revealed that there are differences in terms of block sizes and forms, however blocks facing the avenue are arranged in a linear line. In the map of 1938, it is seen that 23 separate blocks form the avenue and that all the blocks have survived until today. Whilst the number of street blocks remained the same since 1938, minor physical differences are observed between 1938 and 2018. Street blocks numbered 177 and 257 are the ones that minor changes can be detected (Figure 2).

The examination revealed that the block numbered 177, which is located on the west end of the avenue, where the Tarsus Gate of the city walls had once existed, became larger in size and the form of the block had changed between 1938 and 2018. The reason behind this transformation can be explained by the construction of a public space adjacent to the Kemeraltı Mosque built on the ruins of the demolished gate in 16th century. The block numbered 257, on the other hand, was clipped from western side because of the enlargement of a street directed towards north in 1960s, which resulted in the erosion of the original block form in 1938 (Şahin, 2018: 85-88).
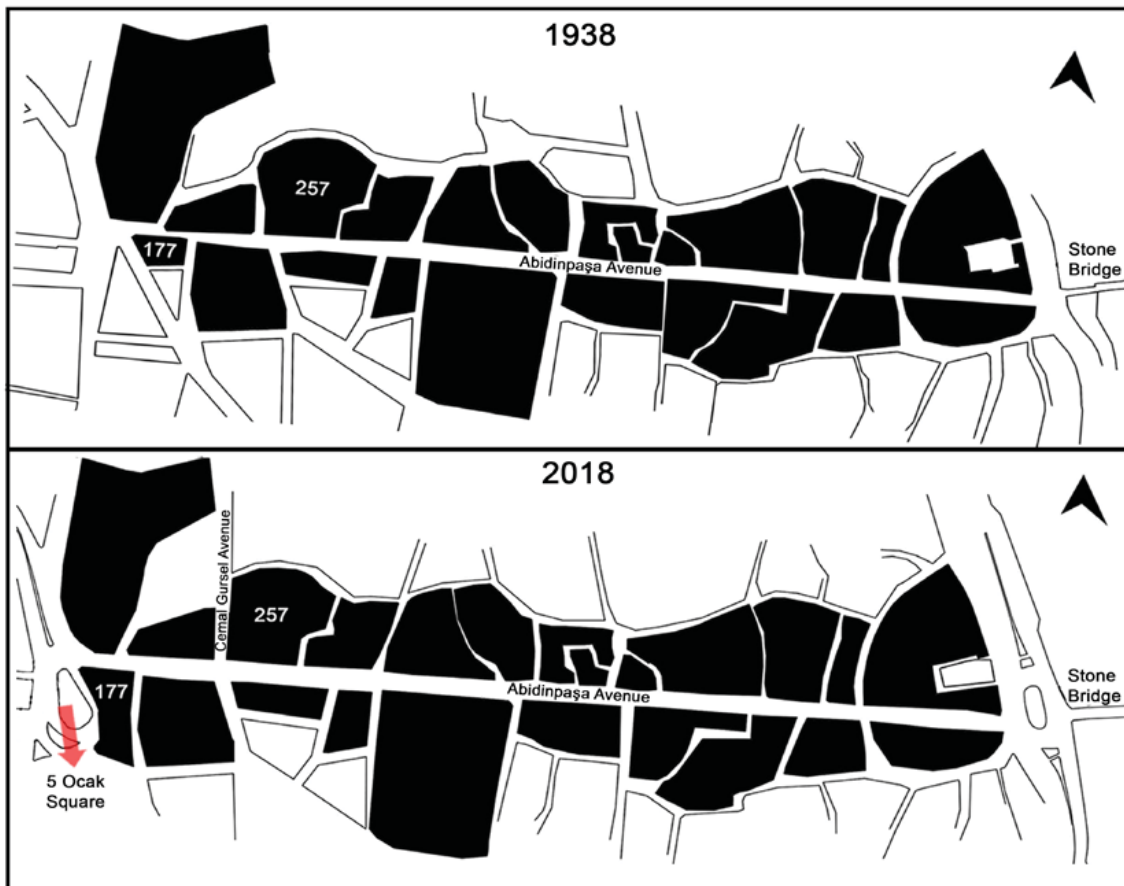
Figure 2. Street System surrounding Abidinpaşa Avenue in 1938 and 2018 (edited from Şahin, 2018).

The comparison of the figurground maps prepared for the study shows that the low density buildings with relatively smaller ground floor areas enabling larger open spaces in 1938 have turned into fully built up plots in 2018 facing Abidinpaşa Avenue, depending on the increase in the land value and the continuity of use of the Avenue as the major area of commerce in the city centre. As part of the urban development processes in the city of Adana, 1950s were the times that improvement of the city both physically and economically was great with an excessive level of migration to the city center (Çopur-

oğlu, 2009). Those improvements resulted in increased construction activities and intense building fabric in the study area. The construction activities in the study area were realized not only by the construction of new buildings on empty plots, but also by the demolition of the old ones and the construction of new buildings. Depending on this situation, some historical buildings were lost, such as the Gregorian Church where Orpheus Mosaic was found during the excavations made for the construction of Central Bank Building on Abidinpaşa Avenue (Şahin, 2018: 95-96). The physical transformation on the Avenue can also be seen in the silhouttes prepared for the study (Figure 3). Figure 3 shows the level of change in the townscape within the time span of 80 years, where only two buildings (both listed) have survived.
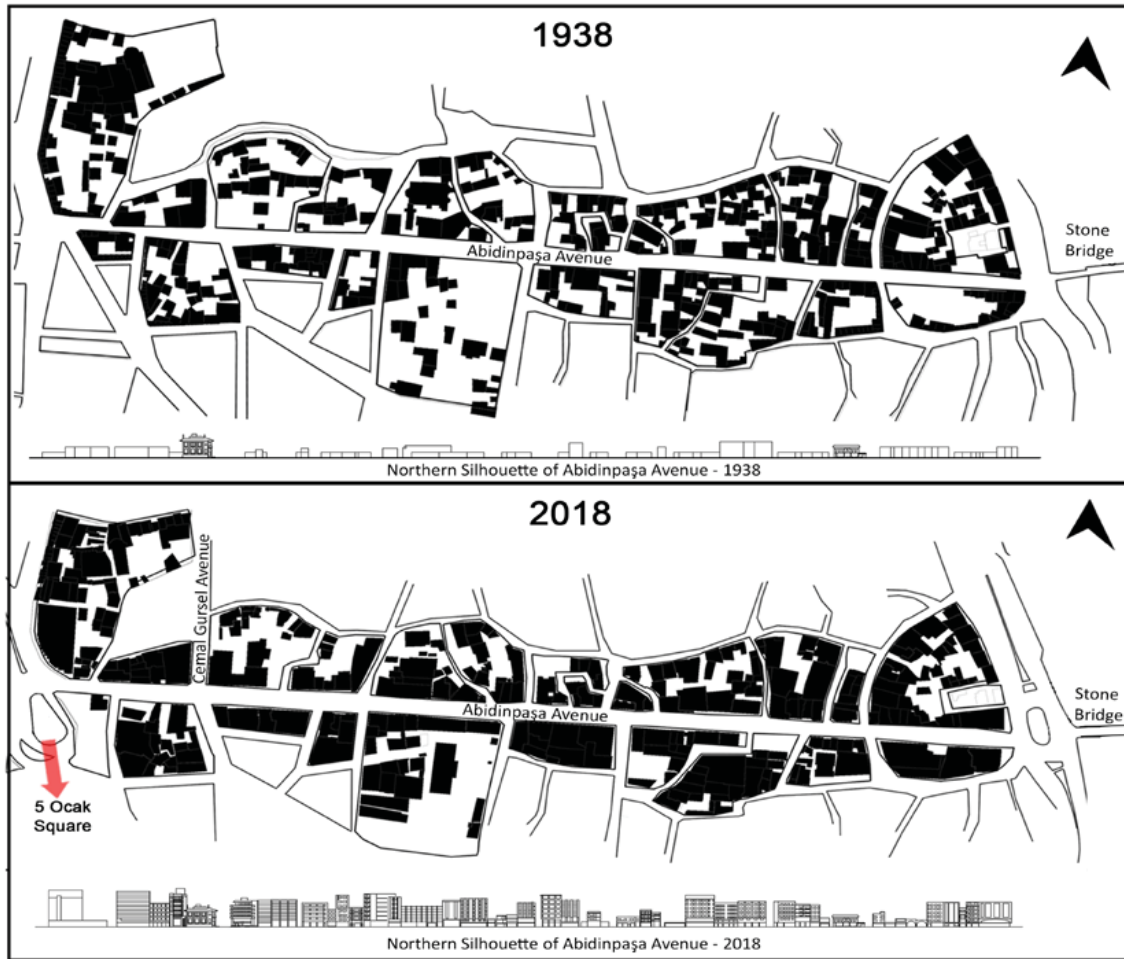
Figure 3. Figureground pattern and silhouettes of Abidinpaşa Avenue in 1938 and 2018 (edited from Şahin, 2018).

Typomorphological analysis

Typomorphological studies analyze the changes occuring in different places at the same time and in the same places at different times, apart from this a historical and typological analysis method used for specified building types can also be used as a guiding design approach (Caniggia ve Maffei, 1979: 9-11). Although it is evident that the specified 80 year period selected for the study is not sufficient enough for a thorough typomorphological analysis that requires longer periods, two dwellings built in different years on Abidinpaşa Avenue are examined typomorphologically within this study. The evaluation consists of analysis of the relationship between the morphological change in the study area and the typomorphological change for the specified dwellings. The listed building numbered 118 as an example of late Ottoman period and Kurttepeli Apartment

built in 1950s as one of the earliest modern apartment buildings in Adana are chosen for typomorphological analysis, because of reflecting the cultural change of the city which can be seen in the plans, space organization, materials and facades of the buildings (Figure 4).

The listed building numbered 118 located in the northwest corner of the block numbered 143 in the study area has a ground floor that has an independent entrance from the Avenue for commercial use, where mezzanine floor and first floor for residential use have a separate entrance. There are three rooms in total on the first floor. While one of them is reached from the common floor hall, two other rooms and a balcony that overlooks Abidinpaşa Avenue are reached from the sofa which is one the main elements of traditional Adana houses (Figure 4). The original plan scheme of the traditional house has been altered with additions, while the ground floor of the house in commercial use is still actively used, the upper floors for residential use are vacant and damaged (Şahin, 2018: 162-165). On the other hand, Kurttepeli apartment which is located in the southwest corner of the block numbered 195 is one of the first modern apartment buildings in the Avenue. The apartment has a ground and a mezzanine floor in commercial use and five other floors used for residential purposes. Commercial areas of the building have entrances from all facades of the building on the ground floor, while the entrance of the residential units is given from the western facade. Even though several different types of stores are seen in the ground floor, the special characteristic of the building derives form the space organization of residential units. Each floor consists of three flats, however every flat also has a private residential unit connected with it. The corridors seen in the plans are an early interpretation of the modern housing plans, but the traditional sofa is also seen as an element of connecting all spaces, which exposes the transition from conventional to contemporary (Figure 4). In the building, which is thought to bear traces of the local culture with the plan organization, it is argued that this special space organization was designed to host the employees of wealthy farm owners living in Adana, who occasionally came to the city center to handle their daily businesses (Saban and Erman, 2011: 168-173).

The comparison between the listed building numbered 118 and the Kurttepeli apartment shows that the periodic conditions are reflected in space organization and the physical features of the buildings. While the listed bulding numbered 118 was built with traditional methods, the construction technique of the Kurttepeli apartment includes a mixed method using reinforced concrete with brick walls. Residential and commercial uses, which are valid for both structures, are examples of continuity for both buildings. The sofa as an element of traditional houses can be seen with a different setup in the Kurttepeli apartment building, which may be argued that it was a result of the transition occurring in the society. While the facade of the listed bulding numbered 118 reflects a traditional Turkish house, Kurttepeli apartment stands out with its modern lines in terms of facade characteristics, as a result of the developing techniques and changing conditions in the 1950s. Although both of the selected buildings are similar in terms of covering residential and commercial floors, and creating separate entrances for differing uses on the ground floor, it is seen that the buildings have different forms and differentiated organizations. Although these differences are arguably a reflection of the distinctive conditions of different periods, they also indicate the cultural transition occurring due to the transformation processes and the development of the housing typomorphology.
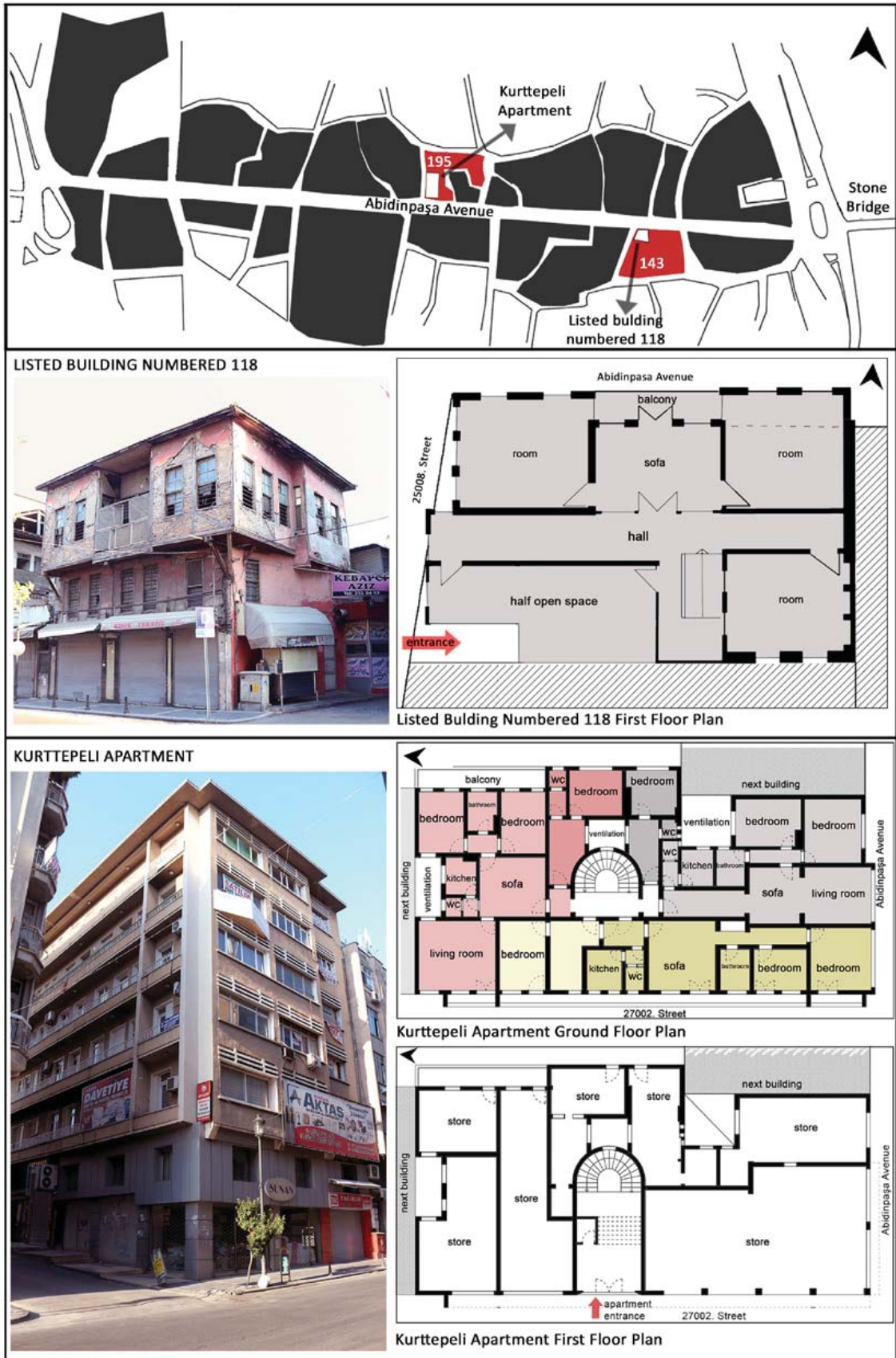
Figure 4. Locations, floor plans and photographs of Kurttepeli Apartment and the listed building numbered 118 (edited from Şahin, 2018: 163-165 & Saban, Erman, 2011: 78-81).

Conclusions

This study aiming to examine the morphological change of the Roman main road and the reasons behind its change focusing on 20th century urban development processes in the multi-layered town of Adana focused on Abidinpaşa Avenue, which is believed to be the Roman decumanus maximus. The examination undertaken with the use of the maps dated 1938 and 2018, as well as other relevant historic documents revealed that Abidinpaşa Avenue is still the main road in the city centre, which embraces various types of commercial spaces. Although the Roman main road (Abidinpaşa Avenue) was surrounded with organic streets formed in the Middle Ages, still it is interesting to see the combination of a lineer Roman main road with the organic street system, which is specific to multi-layered cities. As the street system in the study area is mostly preserved, it is possible to argue that Conzen's idea concerning the street system as the most preserved element of the townscape is supported with this study (Conzen, 1962). The examination revealed that while change had occurred in the silhouttes of the avenue, there are still historic buildings reflecting the cultural richness of the study area. The development pressure on the historic city center of Adana appears as a main factor in the study area that causes loss of many historical builldings, however it is arguably also a consequence of the increasing value of the land.

In terms of the extent of the use of methods developed for urban morphological analysis, the findings of the study showed that it is possible to identify the level of change within the context of multi-layered cities, depending on the documents accessed. As far as the city of Adana is concerned, morphological analysis was helpful to understand the level of change occurred within a limited period of time, as no documents were reached that could give information about how the city was shaped during the Roman period. Nevertheless, the reading of the morphological transformation in the study area within 80 years helped to understand the reasons behind the change of the image values depending on the physical change. The findings of the study also revealed that the typo-morphological characteristics of traditional houses can be traced in modern buildings, although the space organization, materials and construction techniques have changed.

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Industrial heritage as an overlooked potential in urban heritage. Case study Miskolc-Diósgyőr

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Abstract

Industry has transformed towns significantly since the Industrial Revolution. This transformation often took a negative turn, creating degraded landscapes, but it also has positive benefits since industry might create value. Built industrial heritage is an important element of local identity for cities with significant industrial traditions. Miskolc is the fourth-largest city in Hungary today, it is situated in North-East-Hungary, 180 km from the capital Budapest. The city's ironworks was founded in the 1860s, and now its area is derelict and locked into the urban tissue. The abandoned industrial area of about 200 hectares with numerous architecturally valuable buildings is causing serious problems in the structure of the settlement in the valley. Through the example of Miskolc-Diósgyőr, the study examines the possibilities of protecting, revitalising and integrating endangered industrial heritage. Layers of perception place the industrial areas in history and the urban context. They point out their unique and complex architectural features. The urban fabric surveys reveal the internal conditions and its relationship with the town. Through examples of foreign industrial areas and compared with our case study, the feasibility, resilience and economic potential are also highlighted.

Introduction

Industral activities in the area of Miskolc date back to the 18th century. From 1770 the development of the heavy industry had been continous, and finally the 1868 foundation of the new Diósgyőr Ironworks provided a major growth due to which Miskolc-Diósgyőr became one of the most important heavy industrial areas of the Hungarian Kingdom.

The urban topography of the area of Miskolc before the Industrial Revolution

Urban development of medieval Miskolc had been fundamentally determined by its situation in a valley: it lies at the entrance of the valley of the Szinva creek, with connection to both the Great Hungarian Plains and the northern, mountainous area of the country.[1] The growth of the town had been organic until the 19th century. By the end of the 18th century it had almost filled the entire area available for development: on the north and south it started to climb on the hillsides, on the west it had reached the legal border of Diósgyőr (which was a separate settlement at that time), and on the south-east the legal border of Hejőcsaba. Only to the east had some empty area remained by the river Sajó.

Industrial sites established in the 19th century and their effect on the urban tissue

As a consequence of the above, in the second half of the 19th century the industrial sites of Miskolc were established mainly on the east side of the town. These plants (iron foundries, machine factories, mills) were mainly in private ownership. (Dobrossy, 1995, 63–146. p)

West of Miskolc, in the Szinva valley a large royal ironworks with imperial significance was established in 1868. (Boros, 2005, 22. p) The location had several advantages: it was in the ownership of the Crown, the raw materials were relatively close, and the connection to the national railway network was relatively easy to establish. (Kiszely, 1997, 21–23. p)

The factory site belonged legally to Diósgyőr, topographically it was closer to Miskolc. The new factory and its settlement (the so called colony) had filled the area between the Szinva creek and the southern hillside quite quickly, thus the traffic access between Miskolc and Diósgyőr had become rather limited. On the map of the Second Military Survey it can be clearly seen that at that time the valley of the unregulated Szinva creek with its several branches was a flood-prone area, so besides the main route in the middle of the valley two other routes were in use on a higher elevation: one close to the northern hillside and another one close to the southern one. The southern one has been blocked entirely by the ironworks. (Fig.1)

On the map of the Second Military Survey the side track of the factory is already displayed. It branches from the main railway line south of Miskolc, circles around the Avas hill on its south side, and reaches the factory site through a tunnel. The reason for this complicated solution is that it was impossible to lead the side track through the Szinva valley, because its entrance was entirely occupied by the streets and houses of Miskolc. The idea of an underground track under the city centre of Miskolc was also examined, but it was rejected. (Porkoláb, 2003, 146. p)

In addition to the factory in the valley of the Szinva and its colony with its several public institutions another entirely new settlement was established: Pereces, a miner's village north of the Szinva valley. In the beginning this settlement wasn't accessible on road, the inhabitants used the narrow-gauge mine railway connecting the mine with the factory. In Pereces this track disappeared underground, and reached the surface after several kilometres in the adjacent valley, where the factory also had mines with a smaller settlement (Adriánytelep).

The plant and the colony developed quickly. In 1914 another production site was established west from the colony, which was named later as Diósgyőri Gépgyár, DIGÉP (Machine Factory of Diósgyőr). (Dobrossy, 2009, 5. p)

The selection of the location wasn't a very lucky one, and not only due to urban planning reasons. A site north of Miskolc, in the valley of the Sajó, near Sajószentpéter would have been a better choice. Here larger amount of water was accessible, and this location is better accesible both on road and rail. (Kiszely, 1997, 26. p)

The current situation

After the fall of the communist regime in 1989 the metallurgy and machine production in Diósgyőr has fallen in a crisis. The state-owned factories were privatised (the municipality had no ownership over the areas). Due to permanent changes in the ownership now the areas are totally fragmented: the site of the iron works has several hundred owners. Legally it is a single, undivided plot of land, an undivided common property of the owners.

In the beginning of the 1980's the settlements of the factory (the colony and Pereces) were handed over into the ownership of the municipality. By that time the infrastructure of the areas had become obsolete, significant modernisation was needed, what the loss-making factory could not finance.[2] In the following decades as a result of the lack of the maintenance the settlements has been continuously decayed, and they have become slums. Among the two larger settlements Pereces is in a better shape, mainly because the former miners and their families still live here, and have a strong local identity.

The lifecycle of heavy industrial sites usually consists of three phases: growth, decline, recovery. (Németh, 2007) In Miskolc and Diósgyőr the growth had lasted from the 18th century until the 1980s, the period since than has been an almost uninterrupted decline. It can happen, that after the decline an industrial site revives in the same function. In the case of Diósgyőr this scenario has a very low probability, and because of the location and the architectural heritage of the area it would not be desirable. There has to be an other way for the recovery.

Methodology

The methodology of the current study combines elements of traditional (Conzenian, Italian) urban morphology and the Space Syntax analyses. Space Syntax itself cannot detect all of the morphological patterns recognised in the planning history of the site, thus the urban morphological study is focused on the construction patterns, landmarks (focal points), morphological regions and periods. The two methods, not as a combination but additional values work together towards a better understanding of the problems, features and future potentials of the site. Space Syntax quantifies the spatial configuration efficiently and the urban morphological study provides the background, as the following urban and historical patterns and landmarks as potential densification areas.

Space Syntax analysis and urban morphology

Miskolc is traditionally a singe-axis city, with the Szinva creek as its axis. The main traffic routes of the city run along the Szinva, and they are utterly overloaded. Next to the DIGÉP site the city narrows to only three streets, these connect the 20000 inhabitants of Diósgyőr to the other parts of the city. Additionally, a fourth route also exists, bypassing the industrial sites from south. Altogether these four routes connect this part of the city to the entire outside world (to the west of Diósgyőr there are the Bükk Mountains, without major roads or highways).

To the South of the Szinva valley, practically in the geometric centre of the current city a hilly outskirt area can be found, called Magashegy. It is inhabited, but with very low density and poor infrastructure. The adjacent neighbourhoods (Tapolca, Komlóstető) have almost no connection to Magashegy and to each other, although they are only a few kilometres away from each other. Miskolc is a city with a hole in the middle. The main reason for this hole is that the industrial site entirely separates Magashegy from the Szinva valley.

A rough, Open Street Map data based (Krenz, 2018, Kolovou et al, 2018) Choice-analysis supports the above, even though its based solely on the street network, ignoring the terrain. The city is extraordinarily unbalanced. In its street network only those routes have high choice values which had been connecting the separate settlements in the Middle Ages: Miskolc with Diósgyőr in the Szinva valley and the main route connecting Miskolc with the capital Buda through Hejőcsaba. (Fig.2)

The rough Integration-analysis is also expressive. The most integrated part of Miskolc is practically the territory of the 18th-century town and the adjacent parts to the south and west. In spite of its relatively central position the colony of the ironworks has lower values, and the values of the aforementioned Diósgyőr, Komlóstető and Tapolca are even lower. On the map the industrial sites are blank spots.[3] (Fig. 3)

The urban morphology analyses (historic outline and "junctions" as the landmarks and transport connections, physical and mental accessibilities of the territory, road network, installation into the urban tissue - built environment) together with Space Syntax analyses aim to delineate diverse areas of urban development. In this case, the Space Syntax and the Urban Morphology can not act separately, but in complementation of each other: spatial structure analysis, installation character outside the industrial area, conclusions about the developmental history, drawing of the morphological periods of the wider area, as well as the influence of the location of the landmarks (church, more important buildings) on the urban tissue and accessibilities.

Strengths and weaknesses

In the 1980s Miskolc was the second most populated city of Hungary with its 210000 inhabitants. Since then its population have been reduced by cca. 25%. The decline was mainly due to economic reasons, but the identity crisis must have been an important factor too, even though it is not easy to measure. In the decades following 1989 the city leaders, the pr-professionals, and even a significant amount of the citizens had been desperately trying to get rid of the image of the industrial city. (Bereczki and Kapusi, 2019, 52–53. p) In turn, the industry is an important component of the city's past, even though its not the most important.

The more important architectural value of the colonies is their unity. (Olajos, 1998, Bereczki, 2013) The general look of the buildings with their distinctive brick architecture forms an architectural unity, from the small semi-detached workers' houses to the grand public buildings. Thus, the colony of the ironworks and its little brother in Pereces are important representatives of workers' settlements of the Austro-Hungarian Empire, referred as exemplary in the contemporary architectural journals. (Meissner, 1889, Meiszner, 1889)

In addition, on the factory sites several buildings have architectural values on their own right. Discussion of those is beyond the scope of this paper.

Along with the architectural values the complex nature of the industrial heritage has to be mentioned too. The still existing buildings, machines, devices, equipment are the witnesses of their own era, conserving an already gone technical know-how, so they deserve to be saved for the upcoming generations, at least partly.

In Miskolc (and in general in Hungary) the tourism industry and so the city marketing concentrates on the traditional destinations: castles, mansions, historic city centres, spas. In contrast, during the recent decades, partly as a response to the phenomenon of over-tourism, new types of destinations have been catching the attention of the travellers. These include industrial sites. Currently only the most dedicated travellers are able to overcome the obstacles if they want to see the industrial values of Miskolc, but there are some examples.[4] (Fig.4) The industrial facilities have a peculiar aesthetics, which makes them interesting without any context.

Currently, the exploitation of the aforementioned opportunities is facing major difficulties. First and foremost, the ownership is unclear. On a huge undivided plot owned by several hundred companies and individuals it's practically impossible to realise an all-round conception. With the words of Karl Kropf "in effect, patterns of multiple ownership become much more resistant to change than a single or no owner." (Kropf, 2017, 26. p.)

Further problems stem from the enormous size of the areas, their contaminated soil, and the poor condition of the buildings.

Possible solutions and wider context

Step zero toward a possible solution has to be the transfer of ownership of the sites to the municipality. After that new access roads and plot structure have to be established, then, based on a new regulation plan, some of the plots need to be privatised again. On a city scale this opening could pave the way to the integration of Magashegy into the urban tissue, and to the better integration of the outer city parts. The still operating, well maintained industrial railway side track can be integrated into the existing public transport network of the city without major technical difficulties, reducing the load on the main, Szinva-valley line. The track, which once passed through uninhabited areas now reaches the Avas housing settlement with 40000 inhabitants and the University of Miskolc with 9000 students. A south-e-

ast road access to the ironworks is possible to be established without tunnels, on the path of existing tertiary roads.

The map used for the Space Syntax analysis has become suitable for another Choice and Integration analysis with the addition of a proposed rough road system and the roads of Magashegy. On the Choice analysis it can be seen that the city is still unbalanced, but the high value of the Szinva valley route is slightly reduced, and new routes with relatively high values begin to emerge. The single-axis town starts to become a network. (Fig.5)

More significant changes can be seen on the Integration analysis. With the industrial sites and Magashegy included, the values became much more balanced. The previously rather isolated neighbourhoods next to the factory sites (including the colony) became much more integrated, and so does Diósgyőr. (Fig.6)

With the reshaping of the internal road structure and its integration into the urban tissue the rewriting of the sites' hierarchies could begin, but it has to be enhanced by the establishment of new points of densifications, attractions. The most valuable industrial buildings serve as a good base for that: the East and the West Power Plant, the hall of the custom machine plant (egyedi gépgyártó), the hall of the former bolt plant (now extreme sports centre). Of course the selection cannot be arbitrary: a comprehensive inventory of the values is needed. The rewriting of the hierarchy was one of the the first steps to the success in the case of the UNESCO World Heritage Site Zollverein Coal Mine Industrial Complex (Essen, Germany)[5] too. (Braae, 2015, 261. p)

The attraction analysis of Miskolc currently shows a rather unbalanced image.[6] (Fig.7)

The definition of only three new attractions in the new, integrated street network balances the situation remarkably: one on the territory of DIGÉP, one at the ironworks and one on Magashegy (for example a larger public park). (Fig.8)

The areas, especially the ironworks, are so huge, that they cannot (and should not) be filled exclusively by public functions. Currently Miskolc is extending to the flat lands on its east side, unfortunately with very low-density new residential areas. To this direction the risk of the emergence of a suburban sprawl exists. On the territory of the ironworks new urban blocks could be established with 5–7 storey residential buildings, containing diverse functions on their ground floors. A similar plan was made in Copenhagen (Denmark) on the territory of the former Carlsberg Brewery, although it hasn't yet been entirely realised. (Pålsson, 2019, 134–138. p.) The proposed new residential areas offer a solution to the problem of the obsolete prefab housing settlements of Miskolc.

Discussing the strengths, the role of identity was already mentioned. The key concepts of Essen's European Capital of Culture project – based strongly on the industrial heritage – were "urbanism, identity, integration."[7] Urbanism and integration are of special importance in the case of Diósgyőr as well, since the factory sites are urban enclaves, so in contrast to the Zollverein Park for example, they cannot be treated as green areas, landscapes.

In the process of the revitalising, reinventing of industrial sites storytelling has a special importance.[8] It's a good thing, when strolling the streets, public areas not only the visitors, but also the locals too almost automatically meet a narrative, the history of the area so far. At the Diósgyőr Ironworks site everything is present to establish a complex system similar to the Unesco World Heritage Site Blaenavon (Wales, United Kingdom). On the Wales site "all the necessary elements can still be seen - coal and ore mines, quarries, a primitive railway system, furnaces, workers' homes, and the social infrastructure of their community." Similar complexity is also present in Miskolc: old blast furnace, hammer mill, reservoir, pit head, settlements, public buildings, buildings of production. They have to be linked by architectural, administrative and touristic means to form a unified narrative spanning from the 18th century to the end of the 20th.

Student projects

Despite of their difficult accessibility and the lack of the base maps the factories do attract university students. Most recently an international team made an urban scale plan for the territory of the DIGÉP, tutored by the authors of this paper. The students of the Urban Systems Engineering msc programme of the University of Debrecen examined the area with fresh minds, without personal bias.

After exploring, surveying and photographing the area, the students outlined several different ideas. The ideas also responded to the problems of Miskolc: what functions and urban values are missing in the city, what are the long-term plans for the development of the town's institutions, how could the deprived area be reintroduced into the city's circulation. One of the main goals is to reposition the declining industrial area which includes buildings of historic value, to save these buildings unique to the region and to restore their economic significance. The economic potential is represented by tourism and the services provided in the area (recreation, education, commerce). Recreation: extensive park and lake. Education: Faculty of Architecture and Art and a Library. Commerce: shopping mall and services. Tourism: hotel, dormitory. The students works are creatively using the existing Art Deco industrial heritage, to which they associate the main functions, including the library, university and a museum. The layout of open spaces and green spaces takes into account the range of users (families, young people, the elderly) who use the features designed for the area. It also takes care of the accessibility of each area within the planning site (max. walking distance), it also resolves the urban-area traffic with an electric transport loop that provides access to major junctions.

There are also a few architectural theses, which did not focus on the area as a whole, but on a single building or building complex in a wider context.

The plans focus on the social, cultural and educational functions that reflect the needs and shortages of young professionals in case of the city of Miskolc. The selection of the visualized functions can also be attributed to the trends prevailing in this area in Hungary (Ózd, Pécs) or abroad.

Conclusion

Layers of research such as relationships and syntax, urban development and morphology, opportunities (foreign examples, student plans) pointed out that the history of factory sites, the built heritage to date, and its identity-building power could represent new tourist potential and retention power, in case transforming closed industrial areas into mixed-use neighbourhoods that are extensively integrated into the urban fabric. This can be achieved in several steps: breaking down the isolation between the city and the industrial area (public transport, opening new roads), increasing accessibility, and the revitalisation and rehabilitation of green spaces, open spaces and inner connections; clarifying the terminology and protective measures of industrial monuments and taking effective measures; functional urban rehabilitation through the coordination and implementation of monument protection. The complex problem of the subject of the study demonstrates that the development of an appropriate rehabilitation strategy cannot be limited to defining monument conservation tasks. Urban development, economic and social conditions, transport and functional deficiencies and opportunities for improvement, not least urban morphological patterns that are reflected in the area (remaining buildings, new functions) must also be taken into account.

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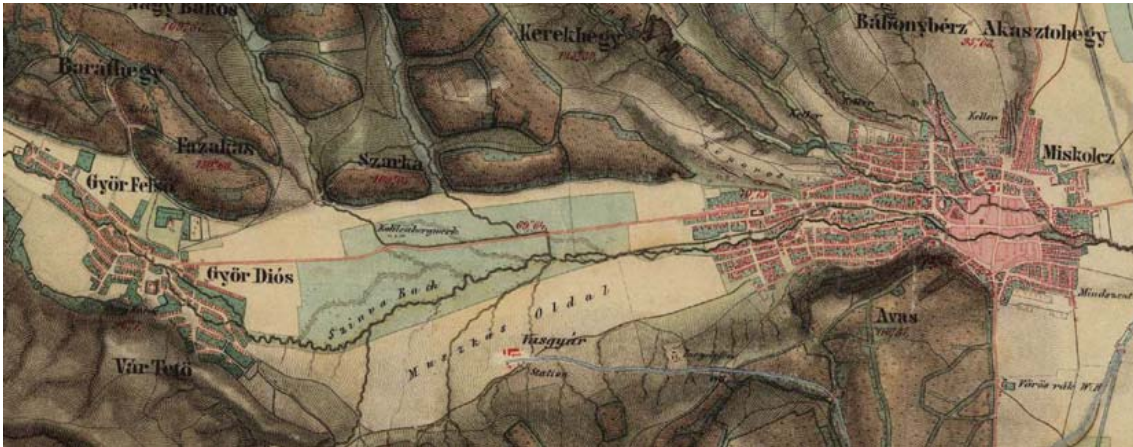
Figure 1. Miskolc and Diósgyőr on the map of the Second Military Survey of the Habsburg Empire, with the seed of the ironworks. Source: mapire.eu
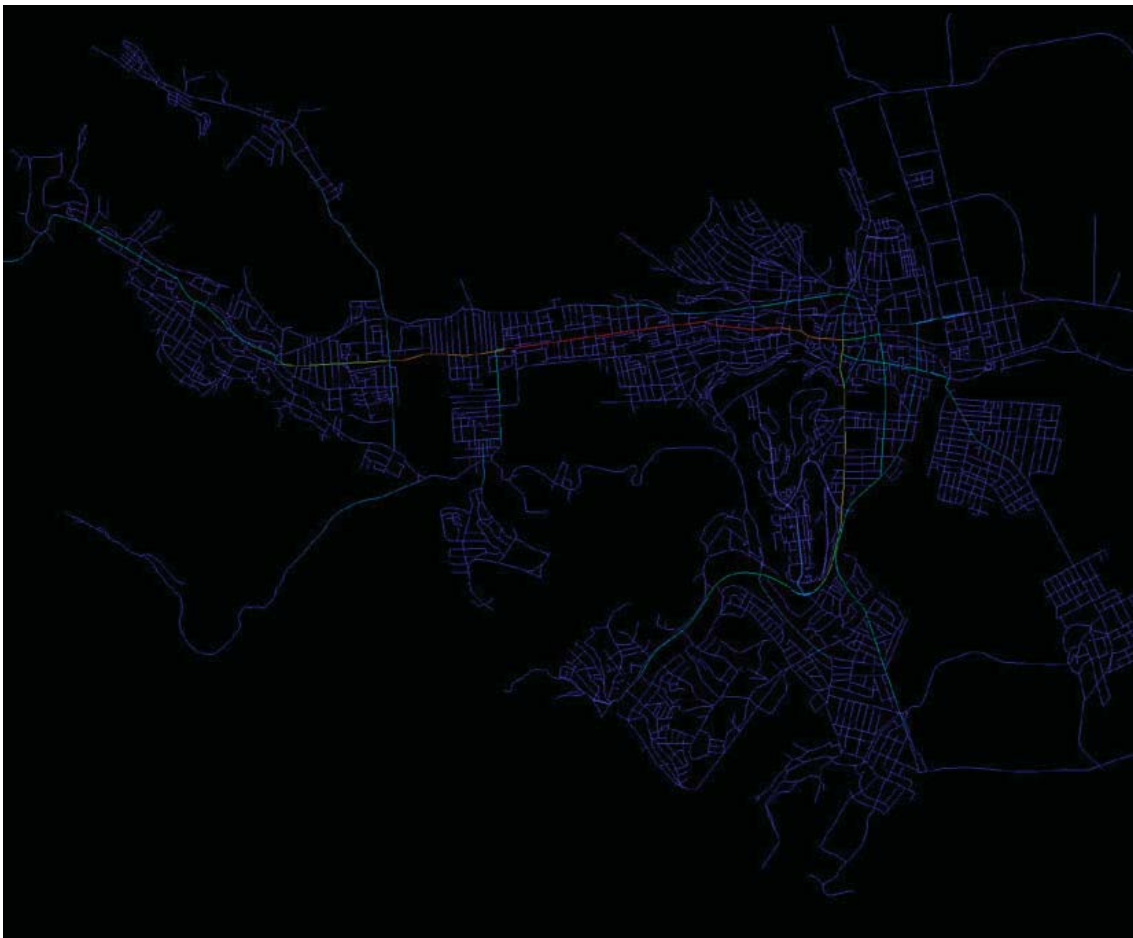
Figure 2. Choice analysis of the current situation.
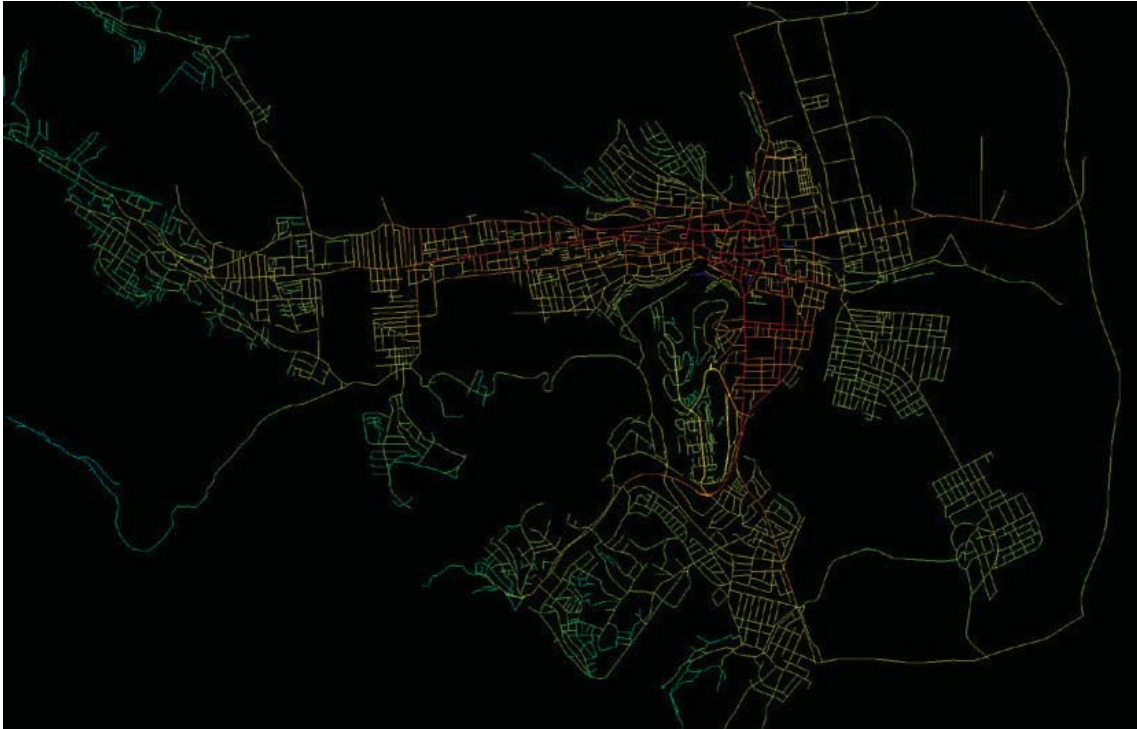
Figure 3. Integration analysis of the current situation.

Figure 4. The cooling tower of the West Power Plant, from the 1930's. Photo: Yves Marchand and Romain Meffre.

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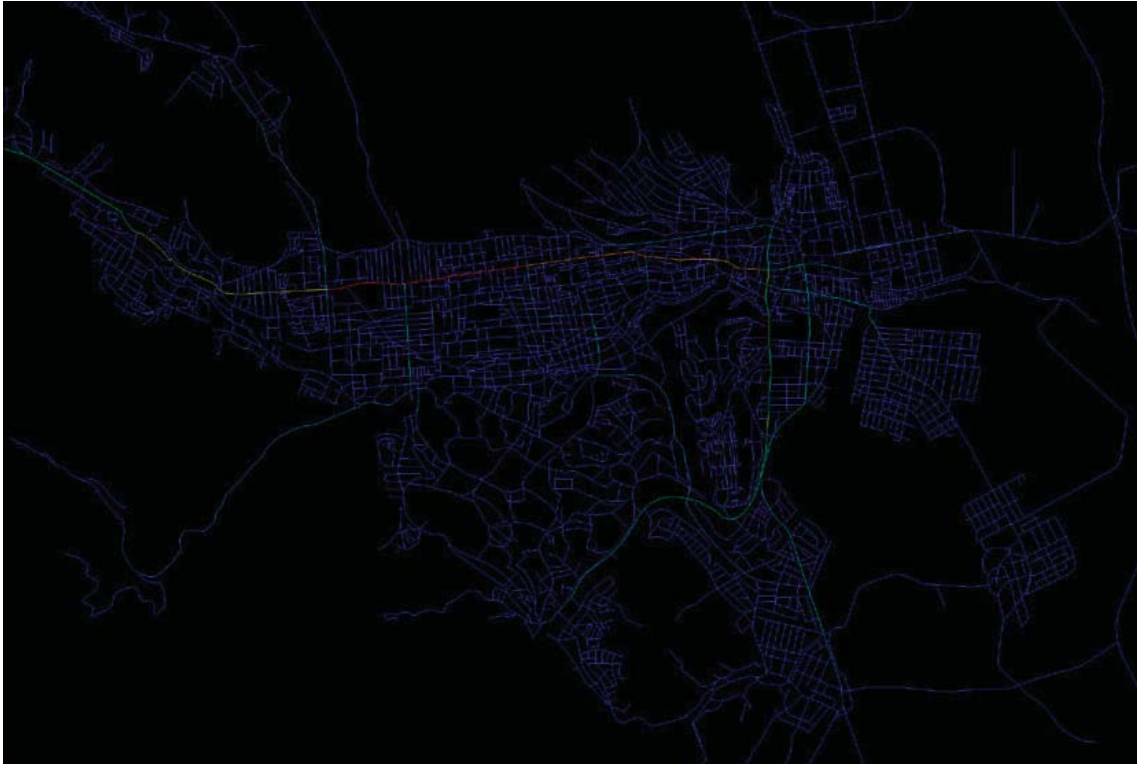
Figure 5. Choice analysis including the new roads.
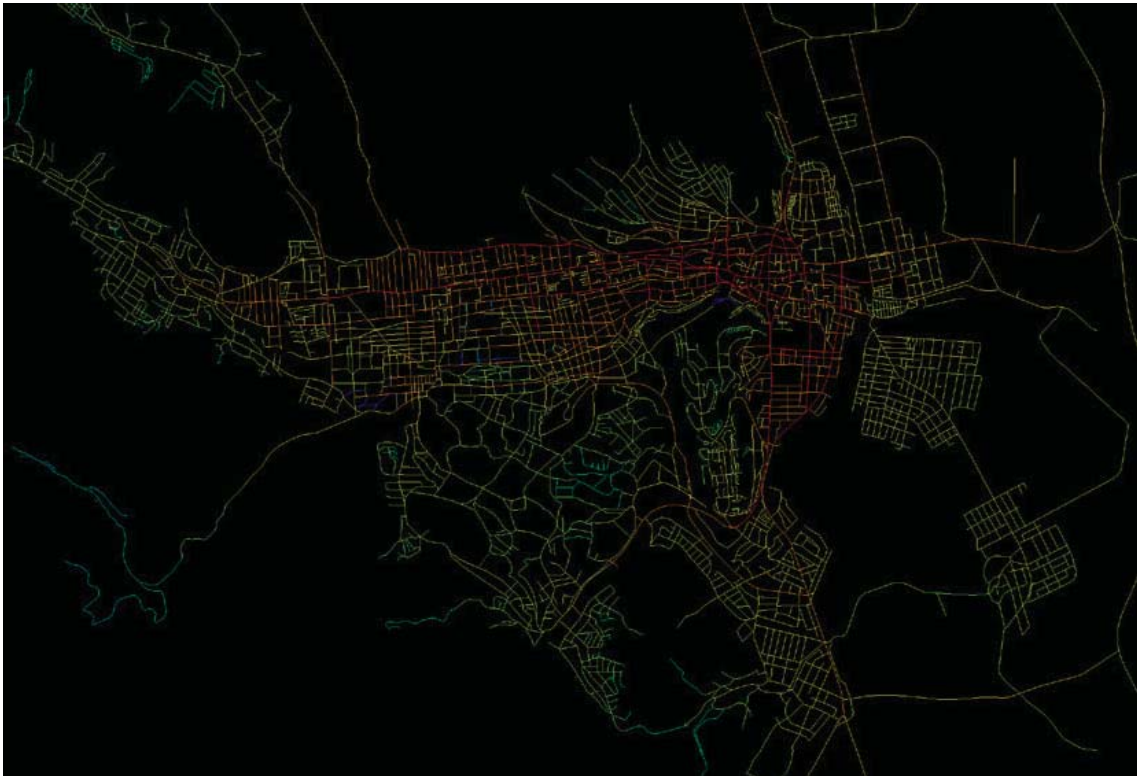
Figure 6. Integration analysis including the new roads.

Figure 7. Attraction analysis of the current situation.

Figure 8. Attraction analysis of the proposed situation.

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Footnotes

[1]On the medieval topography of the town see (Gyulai, 1996), on the early modern topography see (Gyulai, 1997).

[2]Information provided personally by Drótos László, who was the director of the factory at that time.

[3]Magashegy was not considered during the analysis, since legally it's an outskirt and consists of unpaved roads without through traffic.

[4]Most recently Yves Marchand and Romain Meffre – professional photographers from France – made impressive analogue photos at the industrial sites.

[5]https://whc.unesco.org/en/list/975/

[6]During the slightly arbitrary definition of the attractions we have chosen spots which are interesting enough for tourists and inhabitants of other neighbourhoods alike to visit on a regular basis.

[7]https://ec.europa.eu/programmes/creative-europe/sites/creative-europe/files/files/capitals-culture-2010-report_en.pdf

[8]https://forum.savingplaces.org/blogs/sarah-rovang/2019/12/12/a-year-of-storytelling-at-industrial-heritage-site

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The Good, the Bad, and the Ugly

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Historic Design Lessons and Contemporary Planning Failures in Savannah, Georgia USA

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Keywords: *environment, geometry, regulatory, suburban sprawl, urban grid*

Abstract

Major (2018) argues James Oglethorpe's Savannah ward plan is a synthesis of Roman plan castrum and Spanish Laws of the Indies plan models with an American tendency to elongate urban blocks for economic reasons. The ward plan also incorporates double, even triple-loading of building/lot entrances along east-west streets (Anderson, 1989). Space syntax analysis demonstrates this stabilised the topo- metric characteristics of the spatial structure during the first century of the growth in Savannah (Major, 2018). In urban design terms, this represents the instrumental power of Savannah's plan for generating vibrant, human-scale urbanism. However, urban history and planning literature often focuses on the transitory mapping of the political structure in the ward plan. (Reps, 1965; Moholy-Nagy, 1968; Kostof, 1991; Wilson & Shay, 2014). Rarely if ever, does anyone discuss urban growth in Savannah after the 19th century. This paper presents the results of space syntax modeling of Metropolitan Savannah/Chatham County in 2019. Nearly 11,000 urban, suburban, and rural streets represented as axial lines compose this model incorporating a metric area of more than 1,600 square kilometers (or nearly 400,000 acres) and a population of nearly 300,000 people (Source: US Census Bureau). The paper argues urban growth in Metropolitan Savannah represents a stark contrast to the compact, human scale of Oglethorpe's original vision for the town. What emerges is a radical increase in cul-de-sac sequences and loss of inter-connectivity during urban growth of the late 20th and early 21st century due to environmental regulations, modern transportation planning, and the economy of suburban sprawl.

Introduction

Savannah in the United States is the oldest city in the State of Georgia, originally a British colony founded in 1733 (before American Independence in 1783) and administrated by the Trustees for the Establishment of the Colony of Georgia in America under a charter issued and named for King George

II. The Trustees implemented a detailed plan, named after the colony's founder and first governor James Oglethorpe, for an agrarian society of yeomen farmers and prohibited slavery (later legalised by British royal degree in 1751) in the colony's settlement. Oglethorpe was a British soldier, Member of Parliament, philanthropist, and social reformer who hoped to resettle Britain's worthy poor in the New World, initially focusing on those in debtors' prisons. The focus of this detailed plan was the settlement of Savannah – simultaneously founded with the colony – established on the bank of the Savannah River approximately 20 miles (32 km) upriver forming a strategic port near to the Atlantic Ocean.

Today, Savannah and Chatham County is a region of more than 100 diverse neighbourhoods according to one estimate (**Figure 1**). Each year, the city Savannah attracts millions of visitors to its historical areas including the downtown, which the federal government designated as one of the largest National Historic Landmark Districts in the United States in 1966 (**Figure 2**). It includes the Savannah Historic District, Savannah Victoria Historic District, and 22 public squares composing components of the original Oglethorpe Plan. Many people including leaders of the Congress for New Urbanism (CNU) view historical Savannah as a model of human-scale, vibrant urbanism: "Savannah is amazing with the town squares and the hanging moss and the French Colonial houses. It's brutally romantic" (Eaton, 2017).[2]

Savannah is the fifth-largest city and third-largest metropolitan region in Georgia with an estimated population in 2018 of 146,000 and 390,000 people, respectively (Source: US Census Bureau). The total land area of the city itself is 108.7 square miles (281.5 km^2) of which 103.1 square miles (267.0 km^2) is land and 5% or 5.6 square miles (15 km^2) is water (Source: US Census Bureau). The net land area of the city (exclusive of water) is 65,984 acres. Savannah is in Chatham County, which has an estimated 2018 population of 289,000 people. This means approximately 25% (+/-100,000 people) of Savannah's estimated metropolitan population live in the Hinesville-Fort Stewart areas further south outside of Chatham County. The total land area of Chatham County is 632 square miles (1,640 km^2), of which 426 square miles (1,100 km^2) is land and nearly 33% or 206 square miles (530km^2) is water (Source: US Census Bureau). The net land area of the county is 272,640 acres. The Savannah River to the northeast, Ogeechee River to the southwest, and Tybee Island and US Intracoastal Waterway to the east define the bounds of the county, which is inundated by multiple streams and wetlands associated with the Ogeechee Coastal, Lower Ogeechee River, and Lower Savannah River sub-basins (Source: Georgia Soil and Water Conservation Commission). In part, the low percentage of water (5%) in the city of Savannah itself appears to be due to human-made modifications to the topography over time including five flood-control canals and in-fill of minor watercourses and wetlands. The city is prone to flooding due to abundant rainfall and frequent but brief thunderstorms. It is also at high risk to storm surge associated with hurricanes, being in a humid subtropical climate characterised by long, almost tropical summers. There are short, mild winters with few days of freezing temperatures and rare snowfall each year.

The number of households in Chatham County was almost exactly 103,000 in 2010 (Source: US Census Bureau). This is an average net density of 0.38 units/per acre. The average net population density is 1.27 people per acre in the county. The housing and population density seem to accurately reflect the diverse urban, suburban, ex-urban, small-town (such as Tybee Island), and rural nature of Chatham County, all of which lies within a very short distance of each other. The number of households in Savannah itself was nearly 53,000 in 2010 (Source: US Census Bureau). This is an average net density of 0.80 units/per acre or slightly more than two times denser in the city compared to the county. The average net population density in the city is 2.2 people per acre in the city; +73% compared to the county, which is inclusive of the population for the city. We could fairly characterise the city of Savannah as a 'boom town' for much of the 19th century with a population growth of +28.2% per decade averaged over the entire century (**Table 1**). There were significant growth periods in population (>40%) before the US Civil War from 1830-1840 and 1850-1860 and afterward

from 1880-1890 with only a small decline (-3%) from 1820-1830 – probably due to pre-industrial protectionist policies impacting international trade and the local cost of goods in southern port cities since USA population still grew

+33% during this decade – and relative slower growth (+9%) near the conclusion of Reconstruction from 1870-1880. Population growth in Savannah and Chatham County was relatively stable (+18-19% per decade) in the early 20th century until the 1960s. There was a 21% decrease in the city population with only a marginal increase (+2%) or relative stability (-0.3) at the metropolitan and county level respectively from 1960-1970. Population growth in the city resumed at its historical 20th-century pace (+20%) with growth still occurring in the metropolitan region (+15%) and county (+8%) from 1970- 1980. There was another notable drop in city population from 1980-2000 (-3.5% average over two decades) while population growth in the metropolitan area and county remained consistent with post- 1980s increases (+13.6 and +9% from 1980-2018, respectively) with a more significant increase occurring from 2000-2010 (+19% and +14%, respectively).

Table 1: Population growth and percentage change decade-to-decade for the (left) City of Savannah, (center) Savannah, Georgia Metropolitan Statistical Area (record-keeping began in 1960), and (right) Chatham County, Georgia with notable population increase and decreases highlighted in dark gray (Source: US Census Bureau).

YEAR	City of Savannah Population (total)	Percentage (+/-)	Metropolitan Population (total)	Percentage (+/-)	Chatham County Population (total)	Percentage (+/-)
1790	—	—	—	—	10,769	—
1800	5,146	—	—	—	12,946	20%
1810	5,215	1%	—	—	13,540	5%
1820	7,523	44%	—	—	14,737	9%
1830	7,303	−3%	—	—	14,127	−4%
1840	11,214	54%	—	—	18,801	33%
1850	15,312	37%	—	—	23,901	27%
1860	22,292	46%	—	—	31,043	30%
1870	28,235	27%	—	—	41,279	33%
1880	30,709	9%	—	—	45,023	9%
1890	43,189	41%	—	—	57,740	28%
1900	54,244	26%	—	—	71,239	23%
1910	65,064	20%	—	—	79,690	12%
1920	83,252	28%	—	—	100,032	26%
1930	85,024	2%	—	—	105,431	5%
1940	95,996	13%	—	—	117,970	12%
1950	119,638	25%	—	—	151,481	28%
1960	149,245	25%	204,669	—	188,299	24%
1970	118,349	−21%	207,938	2%	187,767	−0.3%
1980	141,654	20%	239,196	15%	202,226	8%
1990	137,560	−3%	258,060	8%	216,935	7%
2000	131,510	−4%	293,000	14%	232,048	7%
2010	136,286	4%	347,611	19%	265,128	14%
Est. 2018	145,862	7%	389,494	12%	289,195	9%

Collectively, this indicates a significant amount of urban growth occurred in the areas outside of the city of Savannah after 1980, especially in the Pooler area along the Interstate 95 corridor to the west of the city and the Savannah International Airport, Georgetown area at the intersection of Interstate 95/Orbital Highway 204 to southwest, and even further south of the Ogeechee River in the Richmond Hill area. The westward and southward spread of this urban growth is relatively clear in historical satellite imagery comparing 1984 and 2019 as well as the mapping of neighbourhoods in the Savannah/Chatham County region (refer to Figure 1 and **Figure 3**). The purpose of this paper is to present the results of space syntax

modeling of this metropolitan growth pattern in the Savannah/Chatham County region. Nearly 11,000 urban, suburban, and rural streets represented as axial lines compose this model, incorporating a metric area of more than 1,600 square kilometers (or nearly 400,000 acres) and a population of nearly 300,000 people (Source: US Census Bureau). We argue this urban growth in metropolitan Savannah/Chatham County represents a stark contrast to the compact, human-scale nature of Oglethorpe's original vision for the settlement of historic Savannah. Instead, what emerges is a radical increase in cul-de-sac sequences and massive loss of inter-connectivity during the late 20th and early 21st century due to environmental regulations, modern transportation planning, and the economic benefits of suburban sprawl.

The Oglethorpe Plan

There are few town plans in the world as widely discussed as James Oglethorpe's ward plan for Savannah (Gallion and Eisner, 1963; Reps, 1965; Moholy-Nagy, 1968; Clay, 1973; Bacon, 1976;

Kostof, 1992; Anderson, 1993, Major, 2001 and 2018; Wilson and Shay, 2014). Kostof (1991) succinctly describes Oglethorpe's plan: "The city grid was organized into wards, each with its own square measuring some 315 x 270 feet (96 x 82 meters). On the east and west sides of each square, lots were set out for public buildings like churches and stores. The other two sides were divided into forty house lots... The *tythings* were grouped in two rows of five house lots, back to back, sharing a lane or alley" (96) (**Figure 4** far left). Major (2018) argues Oglethorpe's ward plan is a synthesis of Roman *plan castrum* and Spanish Laws of the Indies plan models with an American tendency to elongate urban blocks for economic reasons (**Figure 4** middle left and right, far right). In this sense, the Savannah ward plan model represents a uniquely American innovation based on a synthesis of European Renaissance planning principles in the New World. By the time of Savannah's founding, there had already been more than 150 years of settlement founding in North America, beginning with St. Augustine, Florida in 1565. Like the merging of Pre-Columbian town planning concepts in South America with European Renaissance design principles in the Spanish Laws of the Indies, this represents more than enough time for some distinctively American interpretations to emerge in colonial town planning activities (Gasparini, 1993; Major, 2018). Of twenty large-scale, continuously-inhabited American cities today, Savanah ranks as only the 17th oldest city in the United States and 23rd oldest in North America (Sources: Nimvo/World Atlas).

Reps' (1965) famous and replicated 1959 drawing of the historical growth of Savannah's ward plan from 1733 to 1856 often accompanies historical and planning literature discussions about the settlement (Anderson, 1993; Major, 2001) (**Figure 5**). However, this famous drawing represents an idealised view of what was occurring during the early growth of Savannah, based on actual maps and surveys available in the historical record. The creation and subdivision of parent parcels around the periphery of the ward plan had already occurred by 1790. It includes the first instance of grid deformation to the shoreline of the Savannah River to the west of the town, which represents the first significant deviation from the geometric uniformity in the urban block pattern. By 1815, these western deviations became permanent despite continual reliance on rectangular blocks and right-angle intersections between streets. By 1841, further deviations occur in the east adjacent to the expanded ward plan with the first segment forming of a major radial route (modern-day Wheaton Street) connecting at about a 45° angle into Liberty Street at the eastern edge of the ward plan, traveling further to the southeast. By 1865, Wheaton Street has emerged as a radial route to the southeast. More significant deviations from the geometric uniformity of the urban block pattern occurred in the western and southern peripheral areas of the historic ward plan. It also includes the emergence of another radial route (modern-day Ogeechee Road) to the southwest at a 45° angle to the perpendicular and parallel relationships of streets in the original ward plan. This route only tangentially connects – in contrast to the direct connection of Wheaton Street to Liberty Street – to a western edge street (modern-day Martin Luther King, Jr. Blvd.) of the ward plan. Collectively, all these urban pattern deviations indicate conscious abandonment of the planning principles inherent in Oglethorpe's ward model concept between 1840 and 1860.

Savannah and Chatham County Today

Oglethorpe's vision of the ward plan still draws focus about the city of Savannah in the planning history literature today (Reps, 1965; Moholy-Nagy, 1968; Kostof, 1991; Anderson, 1993). At the same time, many lessons about the human-scale nature, livability, and vibrant urbanism in historical Savannah also dominates the focus of architects and town planners alike (Gehl, 2010 and 2011; Wilson and Shay, 2014; Duany and Klinkenberg, 2018). Rarely if ever does anyone discuss what occurred in Savannah after effective abandonment of the ward plan near the end of the 19th century, especially after 1970 with marginal population growth in Savannah relative to large-scale development and population growth in the urban fringe. There is infrastructure supporting large-scale development and growth in periphery of Savannah today (**Figure 6**).

It is still an active, successful port town even as port activities migrated further away from the historical areas of the town, primarily upriver to the west but also eastward towards the Atlantic Ocean, and northward on the South Carolina side of the state border. An extensive railroad network to move freight from the city inland continues to supplement these port activities. The city has an international airport located west of the port and east of Interstate 95 (I-95) as well as an active military presence in Hunter Army Airfield south of historic Savannah. Federal and state governments implemented an extensive interstate/highway system with I-95 running north-south along the Atlantic Coast from Canada to Miami, Florida and Interstate 16 (I-16) connecting Savannah to the largest city in the state, Atlanta. Other significant highway infrastructure includes U.S. 17 (predecessor of I-95) running north-south through the city/Georgetown and an inner orbital highway composed of Stater Highway 204, Veteran's Parkway, and the Harry S. Truman Parkway. Finally, State Highway 80 runs east-west from the beachfront town of Tybee Island through the enlarged center of Savanah along Victory Drive and further to the west through Pooler to Statesboro, Georgia (basically paralleling I-16). The small historic settlements of Georgetown, Pooler, Richmond Hill, and (to a lesser extent) Tybee Island merged into the Greater Metropolitan Savannah Area with urban growth over time. At the same time, the topography of the region is problematic for large-scale urban development due to wet conditions and climate. Historically, resolution in historical Savannah relied on human-made modifications due to in-fill activities. However, this became prohibitively expensive and practically impossible after the US Government adopted widespread environmental management requirements and protections in the National Environment Quality Act (NEQA) of 1969 and Clean Water Act (CWA) in 1972.

For this study, we constructed the space syntax model of Savannah/Chatham County in 2019. Nearly 11,000 urban, suburban, and rural streets represented as axial lines – the longest and fewest lines of sight and movement (see Appendix) necessary to cover the entire urban spatial network within the boundaries of Chatham County – compose this model. In many ways, space syntax analysis demonstrates what most people might expect: a highly-integrated, inter-connected regular grid in the pre-20th century areas of Savannah at – supplemented by highway connections feeding to – the center of the metropolitan area; and, a range from integration to segregation from this center to the edges of the system, somewhat skewed inland to the west due to the influence of I-16 and I-95. Similarly, local integration highlights again the regular grid in the oldest areas of Savannah as well as the strong linear routes defining the urban pattern of Pooler (in the west) and Tybee Island (in the east). Both were small historical settlements later incorporated into the urban growth pattern of metropolitan Savannah itself (**Figure 7**). Space syntax analysis of global choice also identifies the interstates, highways, and major roads including key distribution streets (i.e., arterials and collectors) in certain areas such as Pooler, Georgetown, and to Tybee Island, Skidaway Island, Wilmington Island (east of Savannah but west of Tybee Island) and Coffee Bluff along the Ogeechee River in the south of the county (refer diagram in Figure 6).

The most surprising results of spaces syntax analysis do not concern integration patterns *per se*, but the stark evolution of the street itself over time in the metropolitan region compared to the long, interconnected lines of sight and movement available everywhere in the regular grid of historic Savannah. Nearly 33% of all streets composing the space syntax model of Savannah/Chatham County are cul-de-sacs or cul-de-sac sequences. The latter is a series of mostly two-connected streets that compose a long sequence of routes forming essentially

a cul-de-sac at the macro-scale. Movement on these sequences is mostly binary. There are small-scale, intensively-local singular rings of circulation but the only purpose is to lead you back to the original feeder route, usually a collector or local road in modern transportation planning terms. Generally, this means you only have two choices: move forward or go back the way you came. Critically, most (sub)urban development occurred after 1970. The development pattern layers an almost extreme degree of segregation into the urban spatial network of metropolitan Savannah due to a massive abandonment of inter-connectivity. The reasons for this development pattern seem relatively straightforward. It is the composite result of more than a half- century of environmental protections and stormwater management system requirements indoctrinated by adoption of the NEQA in 1969 and CWA in 1972, and the emergence of simplified modern transportation planning road classifications (highway, arterial, collector, local, cul-de-sac). Collectively, private developers adopt these suburban sprawl models in adjusting their real estate development business models to these regulations. A small portion of such roads is also due to the continual existence of rural roads in the metropolitan region, especially to the south and west of Chatham County (Major, 2018).

What is also interesting is the formal logic of the urban grid in historic and contemporary areas. For example, we can examine six areas of the Savannah/Chatham County space syntax model and detect three distinct approaches to designing the urban network (**Figure 8**). In historical Savannah and the beachfront town of Tybee Island, we see evidence of widespread inter-connectivity, relative to overall settlement size, associated with the regular grid in both areas. On Tybee Island, this tends to focus integration along Butler Avenue/State Highway 80 running parallel with the Atlantic beachfront. However, like historic Savannah, urban blocks are relatively small and compact in the area. Of course, historical Savannah is physically much larger in metric area, so this tends to emphasise the interconnected nature of streets in the entire regular grid instead of focusing primarily along one street. In contrast, Pooler was an existing railway stopover between Savannah and Atlanta during the

US Civil War known as Pooler's Station. Georgetown was an existing rural community due to the Old Kings Ferry Bridge spanning the Ogeechee River on US 17 & State Route 25 to the Richmond Hill rural community on the opposite shore of the river. All three became suburban 'bedroom communities' of Savannah in the late 20th century. Despite this growth, both Pooler and Georgetown still bear the formal logic of a predominantly linear settlement (the former even more so than the latter) consistent with their role as key transportation corridors in this region of Georgia. Finally, both the Scottridge/Berwick Road and Skidaway Island areas bear the formal logic of segregated suburban sprawl. The Scottridge/Berwick Road area integrates outside-to-inside via its surrounding arterial roads as an interstitial component of the metropolitan urban grid. The segregated nature of the spatial network on Skidway Island is very isolated and borderline incoherent, which is in keeping with its real estate development name of "The Hideaway." It is not intended to achieve urban coherence as a spatial system in the same manner as historic Savannah or the beach town of Tybee Island (**Figure 9**). The areas primarily characterised by late 20th-century growth (Pooler, Georgetown, Scottridge/ Berwick Road, and Skidaway Island) share a 'universal blandness' of in their urban design features. The contrast to historical Savannah and the beachfront town of Tybee Island (despite its relative isolation in terms of metric distance from the rest of the metropolitan region) could not be more striking.

Conclusion

Major (2018) argued James Oglethorpe's Savannah ward plan is a distinctly American synthesis of Roman *plan castrum* and Spanish Laws of the Indies plan models with a tendency to elongate urban blocks for economic reasons. The ward plan also incorporated double, even triple-loading of building/lot entrances along east-west streets. Space syntax analysis demonstrated this stabilised the topo-metric characteristics of the spatial structure during the first century of the growth in Savannah (Major, 2018). In urban design terms, this indicated the instrumental power of Savannah's regular plan to generate vibrant, human-scale urbanism. However, urban history and planning literature often focused on the transitory mapping of the political structure in the ward plan. Rarely if ever, does anyone discuss urban growth in Savannah after the 19th century. This paper presented the results of space syntax modeling

of metropolitan Savannah/Chatham County in 2019. Nearly 11,000 urban, suburban, and rural streets represented as axial lines composed this model, incorporating a metric area of more than 1,600 square kilometers (or nearly 400,000 acres) and a population of nearly 300,000 people. The paper argued urban growth in metropolitan Savannah represents a stark contrast to the compact, human scale of Oglethorpe's original vision for the town. What emerges is a radical increase in cul-de-sac sequences and loss of inter-connectivity during the late 20th and early 21st century due to environmental regulations, modern transportation planning, and the economic benefits of suburban sprawl.

Acknowledgements

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Appendix: About Space Syntax Measures

To describe and analyze spatial configuration using space syntax, an axial map of the open space structure of the urban space is necessary. Firstly, the open spaces are divided into the fewest number of the largest 'convex spaces.' A convex space is a space through which no tangent to the boundary can be drawn, which crosses any part of the space. These convex spaces will consist of the least set of fattest ones that cover the whole system of open spaces. For large urban systems such as cities with well-defined streets spaces, it is usually not necessary to draw the convex map before drawing the axial map. You can directly proceed to drawing the axial map based on the open space structure in a plan for the minimum set of lines necessary to cover all the convex spaces as defined by building facades. The procedure for the (a) open space structure, (b) convex space map, and (c) the corresponding axial map (**Figure A1**).

An axial map represents the least set of the longest and fewest straight lines of sight and access that pass through all convex spaces. Once an axial map is obtained, it can be analyzed as a system of relations. Hillier and Hanson (1984) define the relation of all axial lines in the system as measured by two basic properties of "symmetry-asymmetry" and "distributedness-nondistributedness." What this means is the degree by which urban space is composed of rings of circulation or sequences that form trees. Today's software can auto-generate axial maps using shapefiles, but there is still great value in researchers drawing the axial map themselves in the computer to learn more about the urban morphology of the settlement or city.

Connectivity: Connectivity is a simple measure of how many other streets does a single street immediately connect to within the network.

Global Integration: Global integration is the relativised mean depth of a space in relation to all other spaces in a network based on changes of direction. It represents how integrated/shallow or segregated/deep is a space within the urban network. In this sense, global integration represents where you are in relation to everywhere else in that network. According to the theory of natural movement, spaces with higher levels of integration tend to carry higher levels of movement and, hence, a greater potential to access different varieties of land use (Hillier, 1996; Hillier et al., 1993). Globally integrated spaces tend to play a larger role in the urbanity of a city. These spaces are not only more frequently visited as destinations but also more intelligible for carrying through movement where people are

on their way daily from somewhere to somewhere else in the city. It is often useful to limit the radius measurement of integration based on the relativised mean depth from the most globally integrated street in the urban spatial network because it reduces – though not necessarily eliminates completely - the 'edge effect' of global integration, i.e., spaces at the edges of the urban spatial network tend towards segregation because of their location on the edge. Integration shows the pattern of 'to-movement' in the sense of those streets that are most likely to be utilised for segments of journeys from anywhere to almost everywhere else in the urban network.

Local Integration: Local integration measures relativised mean depth up to three (3) changes of direction away from an origin space. It is a more immediate measure of the local catchment area of a single space within the network. The simplest way to understand local integration is if a person imagines themselves standing in the middle of an intersection of two or more spaces and look down the streets in all directions to see all other streets immediately connected to those streets defining that intersection. In this sense, local integration is a measure of locality similarly to connectivity.

Global Choice: Global choice is a measurement of 'through-movement' based on giving every street in the urban spatial network represented as an axial line a value of 1, then proportionally sharing that value amongst all its immediate connections. The shared values for every street are then added up to provide a measurement for the degree of importance of that street within the urban spatial network. Global choice tends to highlight the primary routes within the entire urban spatial network.

Figure 1. (left above) Map of the State of Georgia in the United States, (left bottom) Chatham County in the State of Georgia, and (right) a map of neighbourhoods in Savannah/Chatham County in May 2010 (Source: Wikipedia Commons).

Figure 2. (left) Aerial view of downtown today and (right) street view of Broughton Street looking east in 1905 in Savannah, Georgia USA (Sources: PhotoDune/Licensed to Author and Public Domain).

Figure 3. Satellite view of Savannah and Chatham County, Georgia USA from 50 km in (left) 1984 and (right) 2019 (Sources: Google Earth/Landsat/Copernicus).
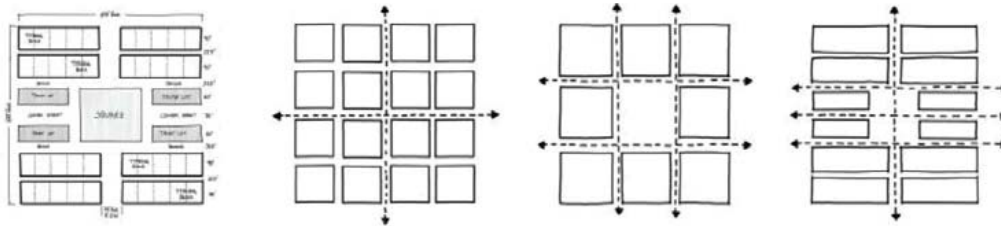
Figure 4. Typical scheme of (far left) Olgethorpe's ward plan model for tything blocks with plot subdivision and trust lots around a central square, (middle left) Vitruvian plan model of a 4 x 4 block structure gathered around a cardo (north-south street) and decumanus (east-west street) cross-axis subdividing the plan into quarters, (middle right) Spanish Law of the Indies plan model with a dual cross-axis defining the edges of a central plaza, and (far left) ward plan model transformation incorporating the American tendency for elongated blocks with a primary cardo (north-south street) and secondary suite of decumani (east-west) streets passing through and defining the edges of the central square (Source: Heba O. Tannous).
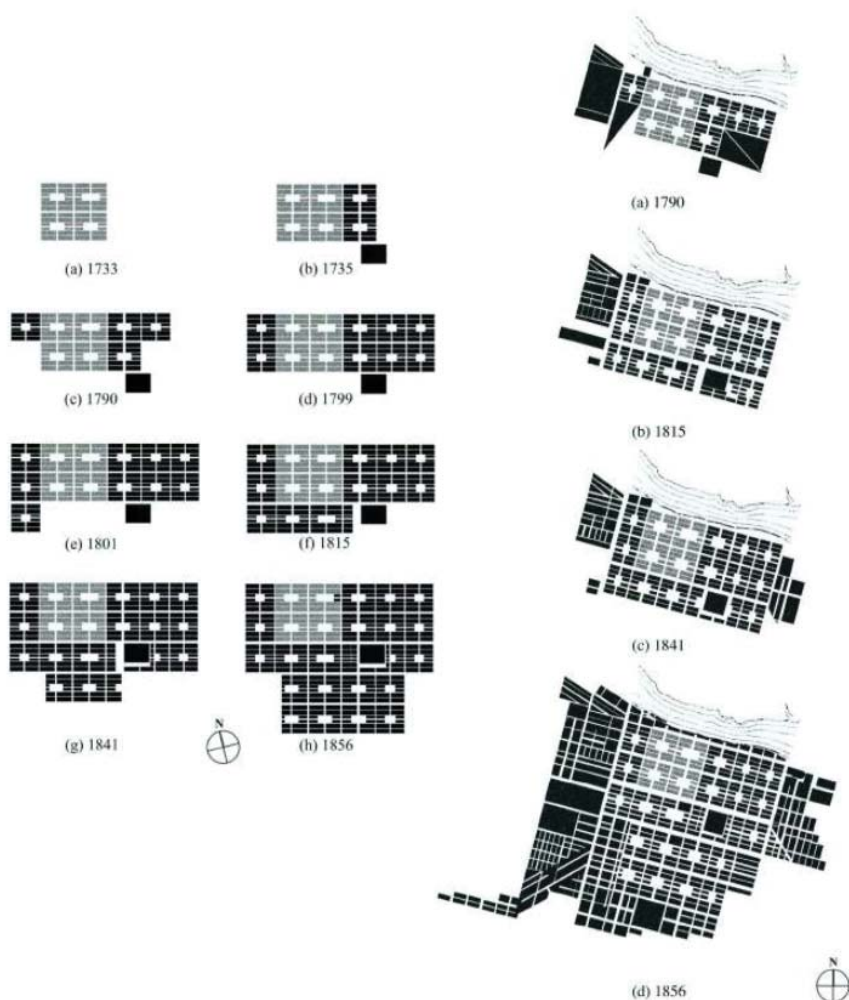
Figure 5. (left) Redrawing of Reps' (1965) famous idealised and reoriented representation of the growth of the Savannah ward plan from 1733 to 1856 and (right) growth of Savannah from 1790 to 1856 oriented to true north based on actual historical maps. All plans highlight the original four wards in grey as a reference (Source: Author).
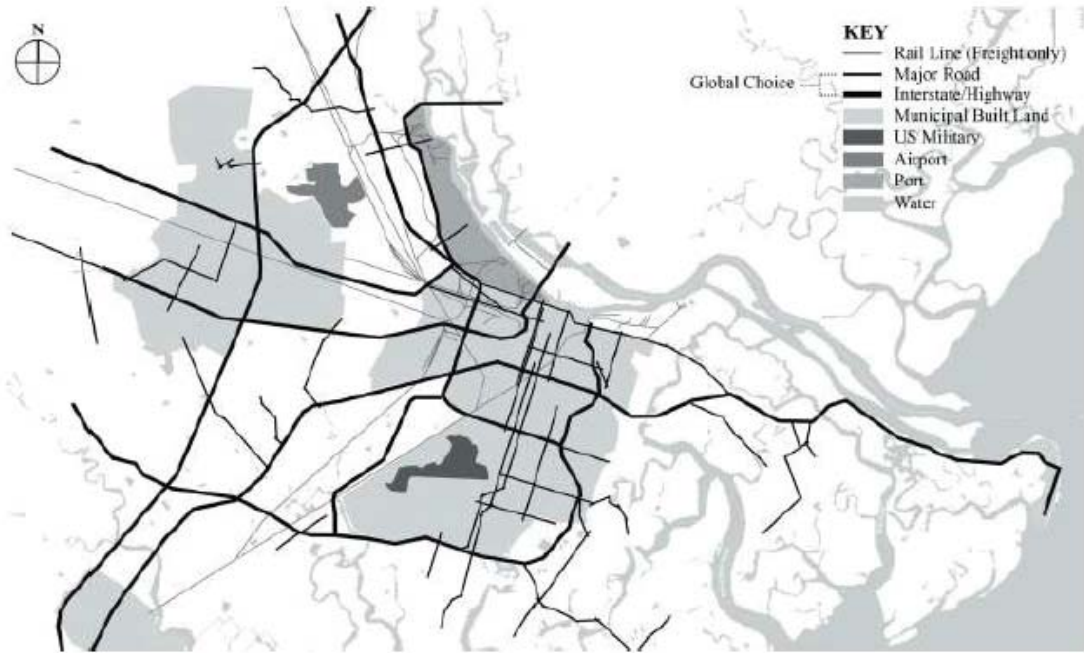
Figure 6. Simplified diagrammatic representation of municipal built areas for Savannah (center), Pooler (west), Richmond Hill (southwest) and Tybee Island (east), major facilities (airport, military, port), railroad lines, and highways/major roads (identified by the space syntax measurement of global choice in the urban spatial network) of Savannah/Chatham County, Georgia in 2019 (Source: Author).

Figure 7. Pattern of (left) global integration, radius=n and (right) local integration, radius=3 in the space syntax model of Savannah/Chatham County in 2019, colored in a range from black (integrated), through shades of grey to white (segregated) (Source: Author). NOTE: The outline of Chatham County is exclusive of Ossabaw Island (a wildlife management area) to the direct south on the Atlantic Ocean (Source: Author).

Figure 8. Pattern of local integration, radius=3 in six areas (top, left to right: Pooler, Savannah, Tybee Island and bottom, left to right: Georgetown, Scottridge/Berwick Road area, Skidaway Island) of the space syntax model of Savannah/Chatham County in 2019 (Source: Author). NOTE: Set to the same metric scale.

Figure 9. Typical views of six areas of Chatham County: (top left) Pooler, (top center) Savannah, (top right) Tybee Island, (bottom, left) Georgetown, (bottom center) Scottridge/Berwick Road area, and (bottom right) Skidaway Island (Source: Wikipedia Commons/Author/Christain Garrett-Schley/Google Street View).

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& | and
CITY REGENERATION | design tools

Notes

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[2] Actor David Morrisey about Savannah, Georgia quoted in Eaton, 2017; 184.

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Lasting Transformation of Erenkoy

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Abstract

In the beginning of 19th century, many subsequent fires occured and the residential districts were damaged in the old town (historical peninsula)of Istanbul. On the other hand, the searches for new settlement areas began in line with the population increase of the city. The uptown areas have been made accessible by the service of railway line and sea transportation. Until that time Erenköy was a small village and after 19th century it became a well-known settlement. Dignitaries and dynasty members began to purchase wide lands. Most of these lands were planned to be used as vineyards, gardens, and cottages designed with pitoresque anxiety were built on them with. By the beginning of 20th century, some new houses were started to build as samples of Modern Movement. As of 1960s the population increase of the city has become uncontrollable and housing needs have become a major problem. In this period, multi-storey aparment buildings have begun being built throughout Istanbul. Unfortunately, these practices were supported by the government with some approved laws and development plans. In Erenköy, firstly the vineyards and gardens were used as apartment buildings and in the following period, cultural heritages like cottages and modern houses were being de-molished to make apartment buildings. Although it has been only 150 years since it was opened for settlement, the changes that Erenköy has experienced are an indication of how fast Istanbul is transforming. This paper focuses on Erenköy experience with criticising policies and comparing master plans of various years.

Historical Development Process

Until the 19th century, Istanbul had been a city surrounded by the city parts of Pera - Galata on the European side and Uskudar and Kadikoy on the Anatolian side. Since the 19th century, there were some significant changes after the frequent recurring fires in the city, the developing transportation system, population increase and the westernization movements.The fact that Sultan Mahmut, II relocated to Dolmabahce Palace made the historical peninsula lose its value after the city's notables preferred the Bosphorus shores of the European and Anatolian sides. The ferry services between the historical peninsula and the Anatolian side and the Haydarpasa - Izmit railway line started to operate in late 1800's, and new settlements began to emerge around Kadikoy. Kiziltoprak, Kalamis, Feneryolu, Erenkoy (Fig.1) are important examples of these new settlements.

Beginning of Settlement

Erenkoy District has been used as a field and vineyard for centuries. The history of the settlement here dates back only to the 19th century (Sehsuvaroglu, 1969). The search of new settlements of Istanbul residents in this century was supported by various opportunities available to them. The first of these opportunities was the development of transportation systems. The first of these opportunities was the development of transportation systems supported with ferry services and railway line.

Another potential for the beginning of the settlement is the changes in planning policies. In the Ebniye Nizamnamesi (Buildings Charter) dated 1848, it was stated that the permission of the sultan was required for the construction of various buildings in places that were not opened for settlement outside of the city (Ergin, 1922). In the Ebniye Kanunu (Buildings Law), which came into force in 1882, it is seen that there were detailed provisions on the opening of new settlement areas. It is mentioned in this law that it was necessary to allocate places that had not been opened yet for settlement, without requesting any fee, to buildings such as police stations and schools in order to divide the lands into pieces and to build a neighborhood by building on it. In addition, it was stated that if the settlement plan prepared by drawing the streets and marking the places allocated for police stations and school buildings is delivered to the Internal Affairs, a license could be obtained under the permission of the sultan. It is also said that the construction of a wooden cottages would be allowed on the vineyards and gardens with at least one decare area in Kadikoy and Bosphorus. Vineyard and garden owners would be able to get a construction license if they prepared the map showing the land boundaries and submitted it to the city council with the documents of necessary payments (Ebniye Kanunu, 1882). The fact that any building construction in the rural areas included in the 1848 Buildings Charter was subject to the permission of the sultan, changed and it became possible to realize the settlement plans with the approval of the sultan in the Buildings Law dated 1882. The construction of wooden cottages in vineyards and gardens was allowed with the approval of the municipality on rural areas. These changes in planning policies pa- ved the way for individual entrepreneurship. The settlement started with the initiatives of Tutuncu Mehmet Efendi around Goztepe Train Station and Mustafa Zihni Pasha around Erenkoy Train Station.

Tutuncu Mehmet Efendi, who owned the Cibali Tobacco Factory, bought 1000 decare of land in Goztepe and divide it to 10 to 25 decare of cottage parcels and sold it to more than a hundred Ottoman pashas and bureaucrats (Akbulut,1994). Located next to Goztepe Train Station, the mosque was built in 1902 by Tutuncu Mehmet Efendi. There is also a police station right next to the mosque.

Mustafa Zihni Pasha undertook important duties such as governorship and finance ministry. The Erenkoy Station Mosque was built by him and completed in 1904. Next to the mosque, there was a school building that is now used as a public education center. Likewise, there is a police station building that could not reach today (Fig.2).

With the development of the urban transportation system and the opening of the individual entrepreneurship, Istanbul residents started to prefer a new type of settlement in Princes' Islands as well as the Anatolian side beaches and Bosporus. This trend, which became very common in the late 19th and early 20th centuries, revealed the

architectural typology of cottage house. These houses consist of more or less large gardens, sometimes small vineyards or even groves, usually wooden two or three-storey residences (Yucel, 1996).

Kadikoy turned into an elite residential area, and the suburbs located in Erenkoy District were preferred by high-ranking civil servants and members of the dynasty. With the man- sions built by the Ottoman aristocrats and the followers who bought land from Tütüncü Mehmet Efendi, Erenköy became a cottage district and entered the suburban process with the provision of necessary transportation and infrastructure services.

1930 - 1960 Period

In the 1930s, when the post-war effects were disappeared, the first extensive planning studies for Istanbul was started. The European Side master plan, prepared by Henri Prost, was approved in 1938 and the master plans of the Anatolian Side, Uskudar, Kadikoy were approved in 1940. In the plan prepared for the Anatolian Side, it was not appropriate to include industrial facilities at any point of Bagdat Avenue next to Erenkoy and it was suggested to be used as a residential area that includes cottage parts composing of retail outlets and single or multiple villas (Prost, 1940).

The master plan prepared by Henri Prost for Kadıköy includes the part up to Fenerbahce, and other parts, including the boundaries of the study area, are marked as residential areas. As stated in the plan report, the buildings constructed in the study area and its surrounding after 1930s are single or two-storey villa type residential buildings located in large gardens in accordance with the identity of the cottage.

Developing in line with the planning works carried out after the proclamation of the republic, Erenkoy preserved its cottage identity in the district. The existing building stock, consisting of detached wooden cottages, each of which belongs to different families and located in large gardens, was added to the existing building stock in vast gardens and the spaces between them, with villas built with the construction technology of the period.

1960 - 1980 Period

Until the 1960s, Istanbul was completely standing with an urban history of at least 150 years. Likewise, Erenkoy continued to be a cottage district with its old wooden mansions located in large green areas and new buildings as villas.

The uncontrolled population growth of Istanbul, which has entered the rapid urbanization process since the 1960s, has caused some of its historical values to be lost. It has been observed that the residential buildings have not survived to the present day were lost in this period .

Due to the reasons that the plan prepared by Henri Prost was outdated and Istanbul could not meet the rapid urbanization needs, Istanbul Planning Directorate was established under the consultancy of Luigi Piccinato, Italian Professor, in 1958. The Directorate determined the Erenkoy region as an "urban development area" and Erenkoy's cottage characteristics before the 1960s has left its place to intensive constructions in the plan decisions (Ekinci, 1993).

After second half of 1950s, the building contractors started to work with build-and-sell system in Istanbul and this new system became very popular in whole country (Tanyeli, 2004). Build-and-sell contracting provides sharing the apartments with the land owner after the construction is completed, without purchasing the land on which the apartment will be built. In this system, which does not require any investment, the necessary budget for the construction of the apartments is provided with selling the flats before the construction is completed.

By the year 1965, Property Ownership Law was approved which would change the entire Turkey's settlement policy. With this law, ownership status of the locations at different levels in a building changed as belonging to different users was enacted. The Property Ownership Law was prepared by lawyers in order to overcome some legal problems, has changed the identity of the Turkish cities over time. The law that encouraged and guaranteed these practices at a time when build-and-sell practices were popular,

resulted with forgetting the traditional housing consisting of one or two-storey detached family houses for centuries, and rapidly multiplying multi-storey apartment buildings. The fact that the traditional houses being included in the gardens and wide green areas, was the most characteristic of the Turkish urbanism (Eldem, 1979) has disappeared and new examples have started to be seen in terms of residential area and height that cannot be compared with the old ones.

Although it has not yet been 70 years after Erenkoy has gained its cottage identity in the town, the features that have made this identity disappeared one by one. Large gardens and green areas have been used as construction sites for new multi-storey apartments. Unfortunately, some of the wooden cottages that tried to survive by staying in the shadow of these apartments have started to be collapsed.

1980 - 2012 Period

In Istanbul, which has to meet the needs of the growing population, the construction of the first bridge connecting Anatolian and European Sides by highway was completed in 1973. The creation of new residential areas, another need of the growing population, was facilitated by the development of transportation. The new master plans were studied both sides of the city which would facilitate transportation by opening the bridge. At the end of 1972, Bostanci - Erenkoy Zoning Plan with 1/5000 scale was approved (Tekeli, 2013). The dominant urban texture between the early 1980s and the 2010s in all Kadikoy districts, especially Erenkoy, emerged with this planning revision.

The Period Following 2012

After 2000s, it was accepted that the population increase in Istanbul is an inevitable fact. The urban planning studies that were carried out were not only to meet the needs of the existing population, but also to the needs coming from the expected increase. However, any attempt made to control population growth could not be seen. The apartmentization, which accelerated after the middle of the previous century, took over the city and examples of multi-storey residential buildings started to be seen in all districts of Istanbul. However, it has been understood from the beginning of the 21st century that the existing housing stock throughout the country is completing its economic life, not only in Istanbul. The most important indicator of this is the demolitions of the 1999 Marmara Earthquake and the urgent measures taken afterwards. From these dates, the concept of urban transformation, which is very popular today, has been discussed.

Urban transformation is based on the implementation of projects that suggest low-income people living in western countries, areas that do not have sufficient physical conditions, and regions such as industries and ports that contribute to urban development (Balamir, 2002). However, the same principles for urban transformation practices in Turkey is not in question. These practices prioritize making residential buildings more resistant to natural disasters and are not limited to a wide area and limited to the building site.

In the urban transformation period, there were situations similar to the apartmentization process in the 1960s. First of all, the investor identity has changed and the build-and-sell contractors have been replaced by more corporate real estate companies and real estate investment partnerships. The Law on the Transformation of Areas Under Disaster Risk Law entered into force on 2012 in order to encourage urban transformation practices such as the enforcement of the Property Ownership Law, which provides apartment assurance and enforcement, and to minimize the problems experienced in the process. When buildings that have completed or are about to complete their economic life are exposed to any natural disaster, these structures must be renewed in order to avoid loss of life and property. However, the Law came into force, taking into account the difficulties in meeting many landlords at the common point in the renewal process and the lengthening of the municipalities' zoning permits. With this law, factors that increase the cost of investors and make projects difficult to start in the urban transformation process have been eliminated (Turkun, 2017).

Erenkoy was one of the first places where the projects started after the relevant law came into effect in the urban transformation process, which has a history considered

recent. Speculative news has started to emerge before six months had passed that Bagdat Avenue and its surroundings would be renewed within the scope of urban transformation. Erenkoy and its surrounding started to be surrounded with high-rise buildings. The situation was noticed when tall buildings started to appear in the environment. In this period, where the density of the building was not only limited to the bird's eye view, but also in the city silhouette.

Density Ratio Changes in Urbanization Process

Erenkoy was a rural area outside the city center before the 19th century. It was opened for settlement as summer cottage district and it was transformed into a suburb that lived for four seasons in the following period, and then, multi-storey apartments started to be built in the district. Today, there is a process where the old apartments are demolished and new ones are made with improved technology. With the various laws and zoning plans that came into force, construction was seen in a way that there was almost no gap on the area. However, the changes caused by this pressure affect not only the buildings but also the part of the city on which the buildings are located.

The determinations were made supported by the numerical data on the increase in the density of the building by calculating the density ratio. Old Kadikoy maps prepared in the 1920s, aerial photographs of 1966 and current maps were transferred to the digital environment and their surface area, building numbers, building residence areas were calculated. Numerical results of density increase were determined by comparing the calculations of three different dates.

For the investigation of the first period, old Kadikoy Maps are collected and the area within the boundaries of the study area was redrawn in digital environment. At this date, the surface of the selected study area was calculated as 3.033.938 m^2. On these dates, the existence of 930 buildings was determined. The total area of these buildings was 87.075 m^2. The paths such as avenue, street, dead-end street, and trail-roads cover a total area of 280,697 m^2. When the total building settlement area is proportional to the square of area; it is understood that the building density is approximately 3%.

For the second period, drawings were made in digital environment on aerial photographs dated 1966. At this date, it was observed that there was no change in the square of the study area. It is known that some of the buildings whose presence is detected in the old Kadikoy maps have been demolished, villa-type houses and apartments have been built. In 1966, the existence of 1610 buildings was determined. These structures have 395.794 m^2 area. The density of the building is 13%. Compared to the determinations made on the maps of the 1920s; while the number of structures increased approximately 1.7 times, the density of the structure increased 3 times. As it can be understood from the results, the structures built in this process interval have much larger settlement areas than the cottages. These calculations are made only through the residence areas, and considering the effect of the apartments on the floor area factor direction, it would be seen that the density increase is higher.

Recently, relevant map sections belonging to the year of 2000 were collected and upda- ted. Investigations were made at the boundaries of the study area. At this date, the square of the study area was calculated as 3.179.731 m^2. The reason of this increase is in the coastal region, the area created by filling on the Marmara Sea.

Today, 367 buildings with a total area of 842.716 m^2 have been identified within the boundaries of the study area. The building density was calculated as 27%. Compared to the determinations made in 1966, it was seen that the number and density of the building increased approximately twice. Compared to the determinations of 1920s, the number of buildings increased by 3.8 times, and the density increased by 8 times on the basis of residence area (Fig.3). This increase in the density of the building has made Erenkoy, which is remembered for its small-scale residential buildings in large green areas, as a part of the city with thousands of apartment buildings placed in a discrete order.

It was observed that mansions and structures such as kitchens, baths, stables and outbu- ildings serving them were found in the large parcels during the cottage period. In the following years, with the increase in the density of the buildings, large parcels shrank

and empty spaces were occupied. There is no urban gap in the area, except for the gardens of some public buildings and parks.

For the change in parcel surfaces, it was examined over and old building block. The structure of this building block in 1920's and 1965, 2013 were compared and analyzed. As in the building density analysis, the old Kadikoy maps is digitalized and determinations were made for 1920s. This building block covers an area of 138.558 m^2. There were 30 parcels of various sizes. The total construction area of 85 buildings in these parcels is 8186 m2. It has been observed that there are three paths that provide access to the buildings in the inner parts.

Zoning plan map sections of the building block dated 1965 were similarly transferred to digital media. In the examinations, it was observed that the building block covers an area of 138.625 m2 and 84 parcels are located on it. The total residence area of the buildings, the number of which increased to 143, is 14,091 m^2. Two of the pathways whose detected in the 1920s, were included in the parcel and not a public space anymore. With this change, the area covered by the building block has increased. On the other hand, it is seen that there is a blind street in a region where new construction is seen on the upper part of the building block. While 9 parcels identified in the old maps remain in their original size, 21 parcels have been divided into 75 parcels. While some construction was seen in some of the parcels subdivided, there are also parcels that have been subdivided although no construction was observed in 1965.

In the 2013 zoning plan, which is still up to date today, it is seen that the building block was expropriated and divided into pieces. New building block pieces cover a total area of 125.203 m^2 and there are 93 parcels on them. While the presence of 113 buildings was detected on this date, the total construction area they occupied was 37.470 m^2. At a time when the density of the building was increasing, any space was considered as a city plot and that space was under construction. Buildings with a small construction area have been demolished, and new structures with a larger scale have been built as far as the parcel sizes allowed. The areas on the route have been expropriated and turned into streets to provide access to new buildings located in various locations of the building block. Due to the intense construction, the subdivision of the parcels was maintained (Fig.4). There are no parcels that have reached today with their original dimensions. The changes explained by the numerical data on the city part also caused administrative divisions. According to the arrangement made in 1860, the area outside the center of Kadıköy is divided into two sub-districts as Kiziltoprak and Erenkoy. However, depending on the density of the population, the population growth also changed the administrative structure of the region, and in 1967, Erenköy Sub-district was no longer an out-of-town administrative area and was connected to the district of Kadıköy. In 1974, the sub-district administration ended, and the settlements took the present position as the neighborhoods of Kadıköy district (Hur, 1994).

Conclusion

The example of Erenköy is an indication of how fast the city of Istanbul is transforming with the changes it has undergone in a period of 150 years. After opening to cottage settlement as a subdistrict outside of the city, the city wall expanded with the construction that continued to meet the housing needs of the increasing population of Istanbul, and it was divided into the neighborhoods of Erenköy district municipality. In the district, which has a very dense residential texture, the buildings are being renewed within the scope of urban transformation and the change continues.

Figure 1. Position of Kadikoy District and Erenkoy (red) on Istanbul map.
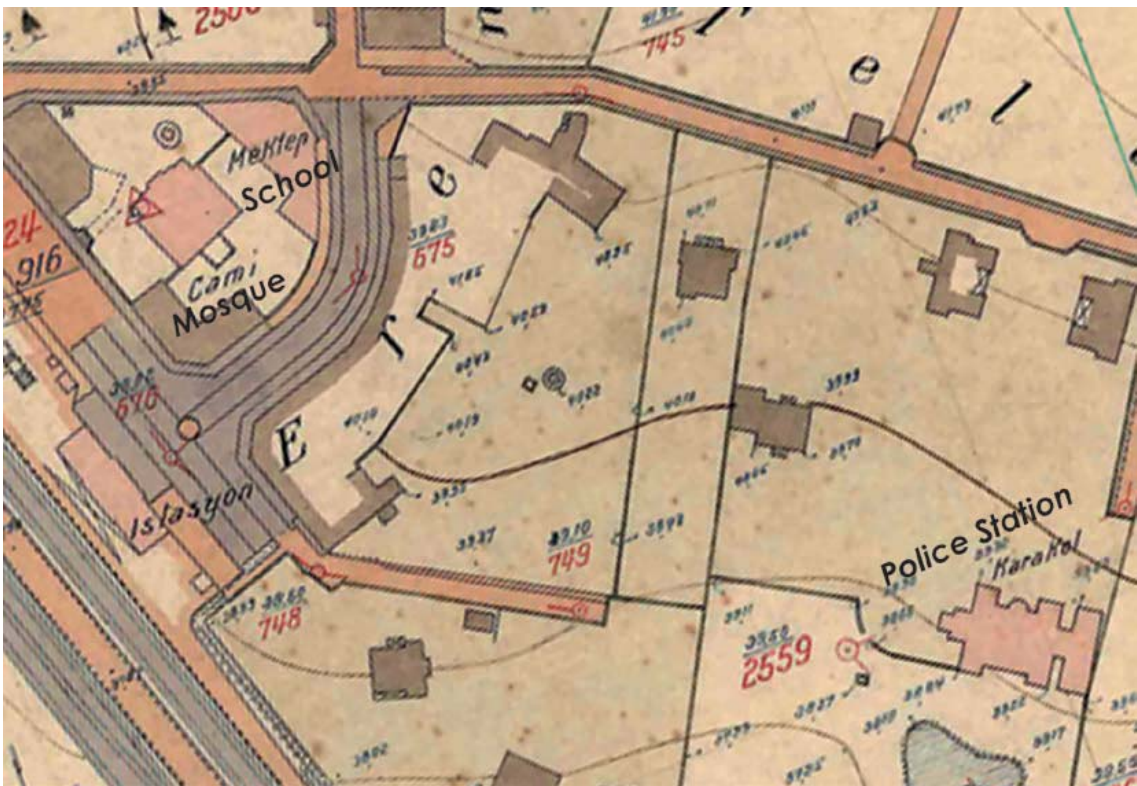
Figure 2. The mosque, school and police station in Erenkoy.
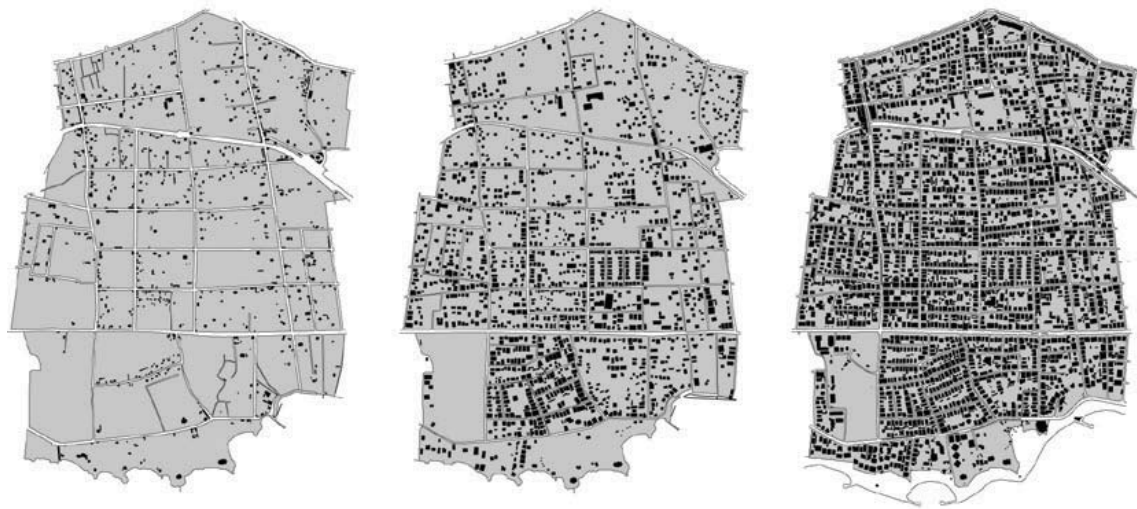
Figure 3. The comparison graphic of building density maps from 1920s, 1966 and today.
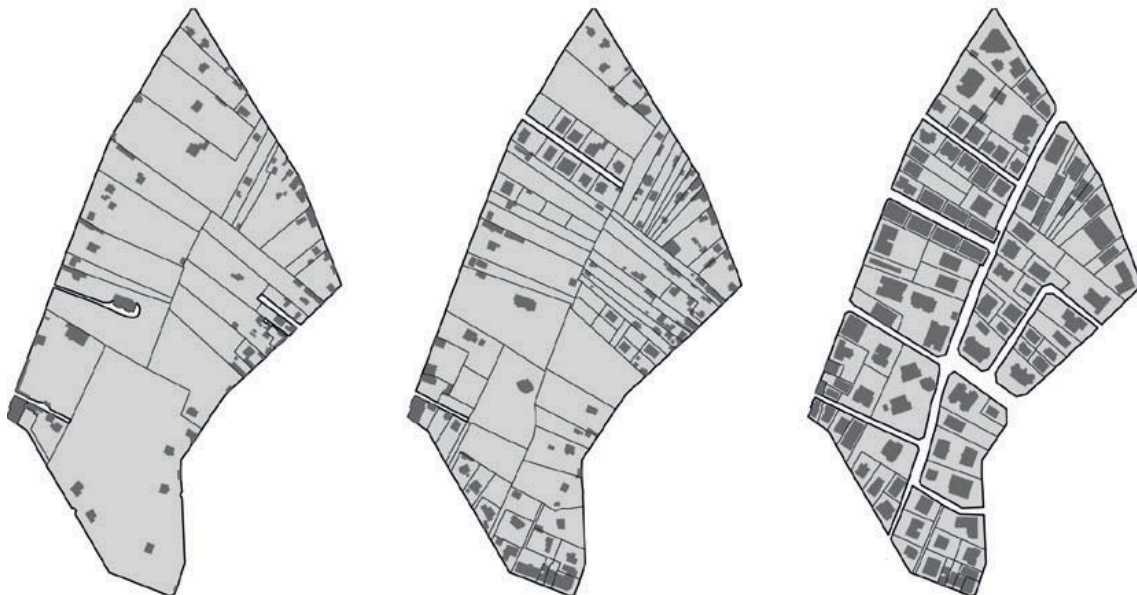
Figure 4. The comparison graphic of building block plans from1920s, 1965 and 2013.

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The effects of planning decisions on the traditional urban fabric of a historical city: The case of Gaziantep in 1968-2008

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Abstract

Contemporary cities are suffering from several consequences of inefficient planning decisions such as the loss of traditional urban fabric, lack of site-specific decisions, inability to predict the effects of migration and investments to the cities. The use of urban morphology methods within the urban planning process can have special importance in dealing with such consequences.

Gaziantep, is an historic city dates back to ancient civilizations and located in eastern Turkey, and has traditional urban fabric as a heritage site. The city is an example of inefficient planning decisions fails to cope with to rapid urbanization. Also traditional urban fabric of Gaziantep has undergone significant changes due to migration and industrial investments after 1950s.

In this respect, the urban fabric examined with the Conzenian town plan analysis approach. Yaprak Mahallesi was chosen as study area for town plan analysis on the scale of the neighborhood. The study area is located in the fringe of Gaziantep's urban conservation area. The traditional urban fabric in this neighborhood is under the pressure of large-scale urban projects adjacent to the area such as an urban regeneration project and a shopping mall .

The street system, building block-building relationship, building-parcel relationship, and floor height analyzes were conducted in this area in 1968-2008. The study shows continuous change in the traditional fabric even though the neighborhood still has traditional characteristics. The study tries to trace the planning decisions that have both positive and negative affects to the case study area.

Introduction

Moudon (1997) has defined urban morphology as a field of study that focusing on the city as the 'living space' of human. Urban morphology is in this manner used as an assessment tool or method in the determination of the change processes of urban fabric and in the sense of the historical roots of their spatial and functional structures (Whitehand, 1986). The main concern of Urban morphology discipline is not only to understand the historical development processes of the city form but also understand what are the economic and social components that direct the urban fabric in the historical process. Geography, urban planning, architecture, archeology and history are the research areas of urban morphology. With this feature, it can be considered as a research area contributed by many different disciplines.

In addition, the discipline of urban morphology is an effort to comprehend the formation of the built environment and the productive forces and actors behind this process. The changes in the historical city centers, destruction of traditional fabric, vanishing traces of the history of the city are the main research areas of urban morphology. The changes in the traditional, pre-modern urban patterns, especially the ones in the historical city centers, have been among the important factors in the emergence of urban morphology schools, and these schools developed their understandings to comprehend the determinants and results of the changes of urban space and fabric. . In this context, it is the subject of urban morphology to investigate the reasons behind the changes in the urban space and to examine the processes experienced by the physical urban fabric. By the help of these analyzes, morphological studies are important while determining future of cities with urban planning or with urban design principles.

This study aims to focus on the relation between the development and the conservation of the historical core of city of Gaziantep with the Conzen's historico-geographical approach. Within the scope of the study, the formation of the city's unique traditional texture were investigated. To understand the major determinants that shaping and affecting the city such as migration and investments, development and conservation plans are studied.. within the study, the method will be clarified in the first part, then the historical development of the study area will be briefly explained in the second part, after that the case study of Gaziantep will be discussed through the upper scale plans and conservation plans, and then the analyzes in the field will be conducted in the third part. Finally, there will be concluding remarks in the fourth and the last part.

Gaziantep city which is located at the southeastern region of Turkey, is chosen as the study area. The city is located on the historical trade routes connecting Anatolia to Mesopotamia and Egypt. It has always occupied an important place in terms of trade, culture and governance due to its location. The social and cultural dynamics brought by these different cultures have contributed to the formation of the its unique urban fabric.

Massive migration movements from rural areas to city centers developing through industrialization have started in 1950's in Turkey. In the same period, Gaziantep's population has dramatically increased due to the migration phenomenon. With the rapid population growth, there has been a crucial development in the construction industry and housing production in the city. After this period urban fabric and macroform of the city has started to change. With this study, the determinant factors of the change in traditional urban fabric has been investigated by the help of morphological analysis of the Conzenian School.

Methodology

M. R. G. Conzen conducted the urban morphological research in mid-twentieth century. He developed historico-geographical approach to analyze urban growth and change. He is the founder of British school of urban morphology (Moudon, 1997) which also known as Conzenian School. In addition to analyzing physical development processes of cities in the historical perspective, he has examined the development of the cities in the context of economic and social development, regarding the population growth, religious structures, and also the social structure and infrastructure systems. He generally conducted his works in medieval cities of England. His most important study is the case of Alnwick, England which is published in 1960. In the study of Alnwick, starting from the origins of the city to the 20th century the growth and transformations of the city were examined. Conzen argues in this that the

city form is a whole consisting of three parts (Conzen, 1960). First, town plan (two-dimensional cartographic representation of the physical settlement of the city such as streets and plots); second, building fabric (buildings and associated open spaces); thirdly land and building use (detailed land use).

Town plan analysis consists of three parts: street system, blocks (areas that define the boundaries of the streets) and buildings (building fabrics on the parcels). The combination of these three parts defines the formation of the region's own morphological hierarchy and creates 'plan units' (Conzen, 1988). Each plan unit is analyzed by looking at the parcel on which the buildings are located and neighboring parcels. Then, how the parcel is related to the street and the block where the street is located is examined. Finally, it is analyzed by looking at the characteristics of the fabric and layers it creates (Conzen, 1988).

The historico-geographical method is used in the case of Gaziantep. this approach tries to understand the physical, social and economic factors behind the changes in urban fabric, which is developed by Conzenian school of urban morphology. Gaziantep has a history dating back to the ancient times, this historicity has important impacts on the formation of city's fabric. However, the city witnessed a rapid development after 1950's along with the industrialization process. For these reasons, it is believed that the dramatic changes in the fabric and development of the city can be best explained by the methods developed by Conzenian school. Therefore, Conzen's town plan analysis method is used to analyze the street, parcel, building transformation in the traditional urban fabric of Gaziantep. Basemaps prepared by Gaziantep Metropolitan Municipality in 1968 and 2008 was used to compare the changes in traditional fabric. Street system, building-parcel relationship, building block-building relationship, floor heights are considered as components of the town plan analysis of Conzen. The changes of the urban fabric in selected area are shown comparing the analyses made on the 1968 and 2008 basemaps respectively, and the planning decisions is examined as the main underlying factor of the change.

Study Area: 'Yaprak Mahallesi'

As mentioned above, Gaziantep has always been an important social, cultural, economic and political center due to its geographical location (Figure 1). The city, which is a border city, has a unique urban fabric and architecture with the effect of different cultures it hosts over time. Urban planning decisions and the effects of urban development policies can be seen by especially looking at the changes in the morphological structure of the area that forms the traditional pattern. Consequently, 'Yaprak Mahallesi' is chosen as a study area for town plan analysis (Figure 2). The study area is located at the northwest of the Gaziantep castle, it represents traditional urban fabric of the city. Also, it is located within the borders of Gaziantep Urban Conservation Plan.

The Ali Nacar Mosque is located at the Yaprak Mahallesi which is built in 13th century. It proves that the neighborhood is one of the first built areas of the city (Kuban, 1983). The documents from the 16th century Ottoman archives contain the name of this neighborhood. Besides that, 212 households were living in the area in 1574 (Özdeger, 1988). In that period the neighborhood was named after the religious building near it (Mahalle-i Ali Nacar).

The study area remains within the existing urban fabric in the first city plan of Gaziantep, which is prepared by Herman Jansen in 1938. As can be seen in Figures 3 and 4, the neighborhood has preserved its historical housing pattern until 1950. North side of the study area were developed as a residential area after 1950, although it was proposed as an industrial area in the Jansen plan. These new developed houses differ from the traditional fabric in terms of building material, floor height and street system.

As stated in the urban conservation plan report regarding the construction of new settlements in the city, the users of traditional fabric have changed. As a consequence, immigrants have settled in this area. The traditional users in this area have moved away from the area. Due to the demographic features and cultural backgrounds of the new user profile who came from the rural or post-war immigration, traditional fabric has started to be destroyed.

The study area is in the traditional Gaziantep housing pattern and street system, besides some part of the area is also within the boundary of the urban conservation site (Figure 5).

Some contradicted changes in planning decisions around the study area are threatening

the traditional fabric. For example, a public space has been transformed into the 'Shopping Center' and 'Hotel Area'. This new development area differs completely from the existing urban form and density. Additionally, the residential area which is North side of the study area was declared an urban redevelopment area in 2017 in accordance with the "Law No. 6306". In addition, on the southwest border of the study area, the old stadium area is demolished. replacing the demolished stadium with a new 'public Garden and Mosque' Project is on the government's agenda. However, it is not precisely determined yet. It is probable that any new function would affect the traditional fabric.

Major Decisions in Development Plans of Gaziantep effecting the area

The first development plan of the city was made in 1938 by Hermann Jansen. This plan aims to protect the historical center with a conservative approach; he suggested new development areas outside of the historical neighborhoods and towards west and southwest direction. New residential areas also separated from the historical center of the city by a railway and green areas (Figure 6).

In 1950's, Jansen's plan decisions and goals were insufficient due to the increase of population and slums. Therefore, the city needed a new development plan. The new plan was prepared by architects Kemali Söylemezoglu and Kemal Ahmet Aru in 1950 (Figure 7). The plan proposed again as a compact growth in the morphological structure of the city. In this plan, for residential areas development direction continued in the west and southeast of the city as Jansen proposed. In this period, the illegal settlements have arisen on the northern part of the city. Immigrants from rural areas created a new urban fabric which sharply differs from traditional urban fabric.

The programme of the city's third development plan was made through a competition opened in 1969-1972. City planner Zühtü Can and his team won the competition (Figure 8). Development through industrialization policies in Turkey in 1970 has played an important role in the location of the industry in urban areas. Industrial zones started to build in the city according to these urban policies. Providing major transportation axis along Silk Road to city center, industrial areas and the city has connected. By this way, city's macroform development went towards this axis.

There were no significant changes in the city from 1975 to 1990. By 1990, a new development plan was needed with a population increase in the city's industrial development. The fourth development plan was made in 1990 by Oguz Aldan (Figure 9).

Planning decisions in this period is adding the first ring road and highway transportation connections. The plan decision envisaged as the bus terminal building and central business area in the north, and the growth of the Organized Industrial Zone in the northwest were large-scale decisions affecting the macroform in this period. By 2015, the city population approached two million (Table 1). The built environment of the city expanded due to the ring road connections. Organized Industrial Zone has spread to a wider area by showing continuity.

Major Decisions of Conservation Plans effecting the area

While the city continues its development, the need for a conservation plan has emerged in the historical area due to the pressure of development. The first comprehensive registration decision for the precinct around 'Gaziantep castle' was taken in 1972.

Like many other cities in Anatolia, the majority of the buildings that constitute the traditional fabric of Gaziantep are the structures that were built in the late 19th and early 20th centuries (Kuban, 1983). The first urban site border was determined in 1979 in the area where the buildings forming the traditional architectural fabric of the city are located. The first conservation plan for these areas was approved in 1980. The major conservation decisions in the Report of the Conservation Plan made by Dogan Kuban in 1983 consists:

• To avoid creating new transportation axes within the historical core and preserving the existing urban fabric.
• Preventing density increase within the precinct by limiting the new constructions in the areas determined as the first- and second-degree protection zones.
• A certain limitation of building heights in the precincts close to the historical

core, in order not to disturb the silhouette.
  •   Control of building construction and limitation.
  •   Conservation of the buildings with the courtyards considering the relation of the building with the street has a unique architectural pattern.
  •   The roads in the historical fabric should never be changed.
  •   The population density in the area should be controlled.

1983 conservation plan needed to revise due to implementation problems such as 'imprecise arrangements for traditional fabric, transportation arrangements, road enlargements and construction decisions' (Gaziantep Conservation Plan approved by Gaziantep Regional Council for the Protection of Cultural Heritage, dated 24.03.2011 and numbered 518., p.8)

The new plan came into effect in 2010. The major protection decisions made in the 2010 conservation plan are as follows:
  •   All original qualities of existing traditional buildings should be preserved. Settlement typologies and the conservation of residential properties with courtyards are among the main objectives of the plan.
  •   Narrow street layout is one of the most important features of traditional pattern. Except for mandatory reasons, it is essential to protect it with the current width.
  •   The buildings that creates the traditional fabric of the area must be preserved with their existing features such as building material, facade, height limitations and size.
  •   Improvement decisions have been developed in buildings that is damaged by illegal constructions, additions and plan decisions.
  •   Since the courtyard buildings are an important representation of the traditional fabric, the solid-void ratio and the density value in the traditional fabric were maintained.

Morphological transformation of the 'Yaprak Mahallesi' between 1968-2008

M. R. G. Conzen's town plan analysis method was used to analyze street, parcel, building transformation in the fabric. Basemaps prepared by Gaziantep Metropolitan Municipality in 1968 and 2008 was used to compare the changes in traditional fabric. First base map was prepared in 1968 for the zoning plan competition, which will be opened in 1973. Second one was prepared in 2008 to meet the needs of the growing city after 1990's.

Street System

In the street system of 1968, the area has more organic streets and it is observed that cul-de-sacs within the building blocks are dense. In 2008, the cul-de-sacs were largely destroyed, and some cul-de-sacs turned into streets.

According to the 1983's Conservation Plan Report, the existing road pattern cannot be changed. In the 2010 plan report, it is said that all the cul-de-sacs should be preserved. On the other hand, it is said that certain arrangements can be shape by users' expectations. Considering the analysis on the study area, it can be seen that some cul-de-sacs in the areas inside the urban conservation site boundaries are converted into streets (Figure 10).

Building Block-Building Relationship

When the base maps of 1968 and 2008 building blocks are compared, it is seen that there is no change in the building blocks. Although the building block sizes did not change, there were important changes in the building forms (Figure 12). Also in 2008, it can be seen that new buildings were added in the building blocks.

Although the area is located within the Conservation Area, it is clearly seen that some of the listed buildings have been demolished. Regrettably, the new constructed buildings' form is completely altered from the traditional fabric (Figure 11). Additionally, some of

the buildings that existed in 1968 were demolished due to the development plan implementations such as road widening and the opening the cul-de-sacs to streets.

Building-Parcel Relationship and Floor Heights

The existing building fabric in 1968 are located more homogeneously on the parcels. In 2008, with the increase of the buildings on the same area, the density in the parcels approached the maximum level. After making the solid-void analyzes, it is observed that building density is increased in the area in 2008. Considering this increase in terms of floor heights, the increase in density can be read more clearly. In the area, average height of 1 and 2 floors and rarely 3 floors in 1968 (Figure 15). In 2008, it is seen that 2 and 3-storey buildings were built and new buildings were built in the demolished buildings' parcels. Figure 13 shows the relationship between traditional houses and newly built buildings in the neighborhood.

The study area is located at the Second-Degree Protection Zone in the plan made in 1983. In the report the emphasis was focused on maintaining and not increasing the current density values for these areas. In the plan report in 2010, it is said that the existing density should be preserved under all conditions. However, as can be seen in Figure 14, the increase in density in the fabric is clearly seen. It is observed that the principle of preserving the existing density in the plan decisions has not been applied.

Conclusion

When the analyzes were evaluated within the scope of this study, it was observed that investments and spatial decisions and afterward spatial site choices had a crucial impact on the shaping of the city's macroform and also urban morphology. Actors, investors and local government decisions have a significant impact on the shaping of the city space. The transformation and transformation processes and spatial effects of Yaprak Mahallesi, which has existed in the city since the 13th century and has a traditional fabric, were analyzed by Conzen's town plan analysis method. With this method, the study area was examined in the hierarchy of buildings, parcels and streets. Analysis made by using aerial photographs, street system, building block-parcel, building-parcel and floor heights were examined comparatively in 1968 and 2008.

The rapid development of the city, the differentiation of the users in the traditional texture and the lack of protection culture of the users and local governments in the city caused deterioration in the traditional fabric. It has been demonstrated that the inadequacy of the Conservation Plan decisions and planning implementations made in the historical environment are effective factors reshaping the urban fabric.

Since conservation plan decisions are not precisely implemented, uncontrolled transformations, the construction of new buildings that are completely inconsistent with the old building construction technique, material type and height in this surrounding area caused the urban fabric's deterioration process. These factors came together and caused the traditional Gaziantep housing pattern to be destroyed by unconscious and illegal ways. In this uncontrollable process of destruction and deterioration, necessary precautions must be taken by local administrations and control of these protected areas should be more frequent. Local governments and administrations should develop new methods and ways for controlling the conservation sites to prevent unauthorized interventions to both the buildings and the urban fabric. Additionally, by the analysis it is observed that the organic street system was deteriorated, the density of the buildings in the area has increased, and in time, the architectural structures and materials used in ways that did not correspond to the traditional urban fabric.

Although the shopping mall area inside the Yaprak Mahallesi is located close to the urban conservation site, it has completely incompatible both as function and as parcel size regarding the current fabric of the area. This situation is a threat to the urban conservation site. In addition, it is clear that the urban redevelopment project to be made in the northern part of the neighborhood and the 'Public Garden Project' to be built in the demolished old stadium will put pressure on the traditional urban pattern of the neighborhood. For this reason, it is an important issue to consider how the plans from different scales in the city center will affect the historical urban fabric.
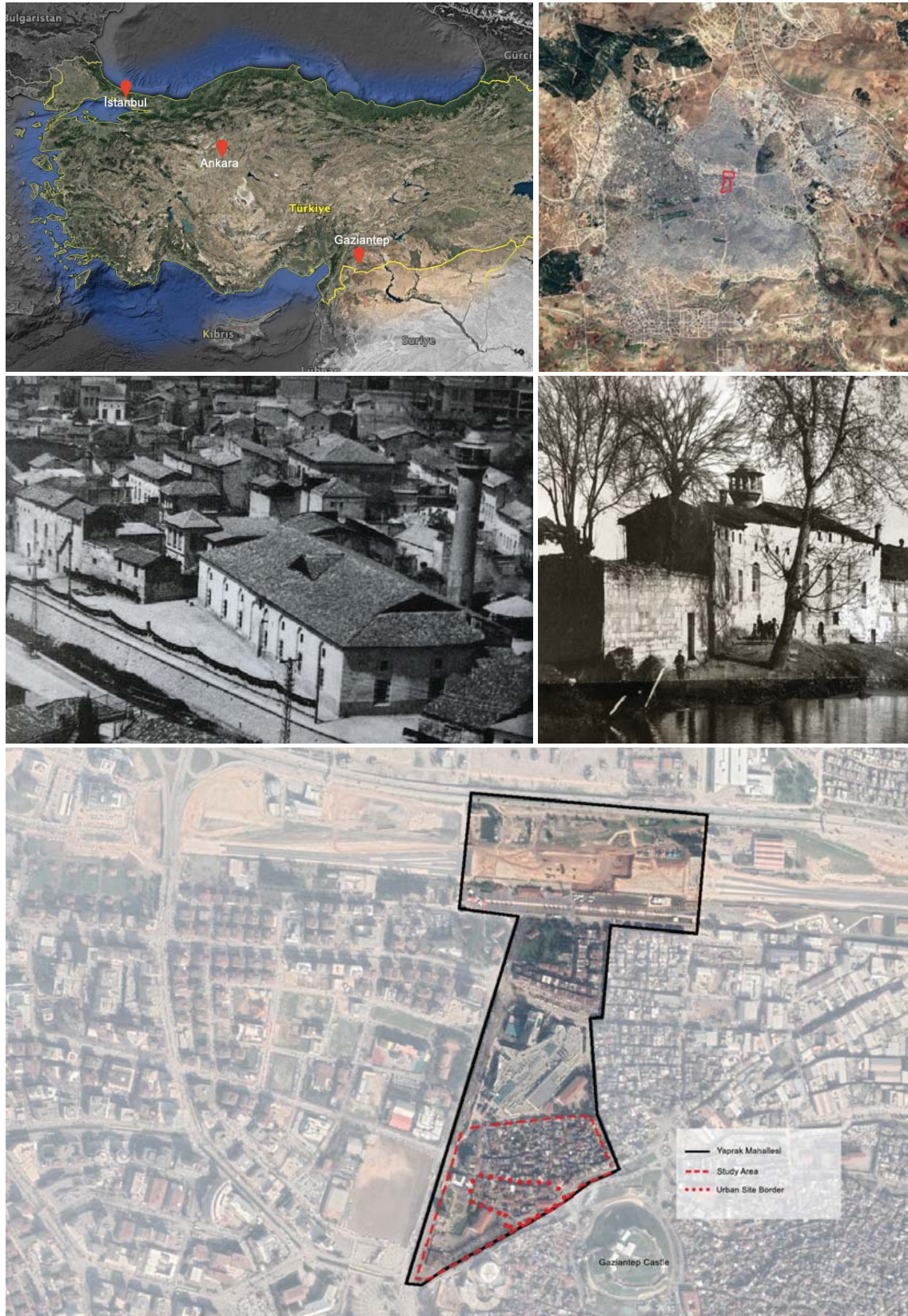
Figure 1. (from the upper left to the lower right) Gaziantep City's Location in Turkey; **2.** Aerial Image of the Study Area; **3.** Ali Nacar Mosque and Complex, 1950'ler (Yakar and Uçaner, 2015); **4.** Ali Nacar Mosque, 1949 (Abdullah Edip Çitçi Archives); **5.** Study Area: Yaprak Mahallesi, Gaziantep.
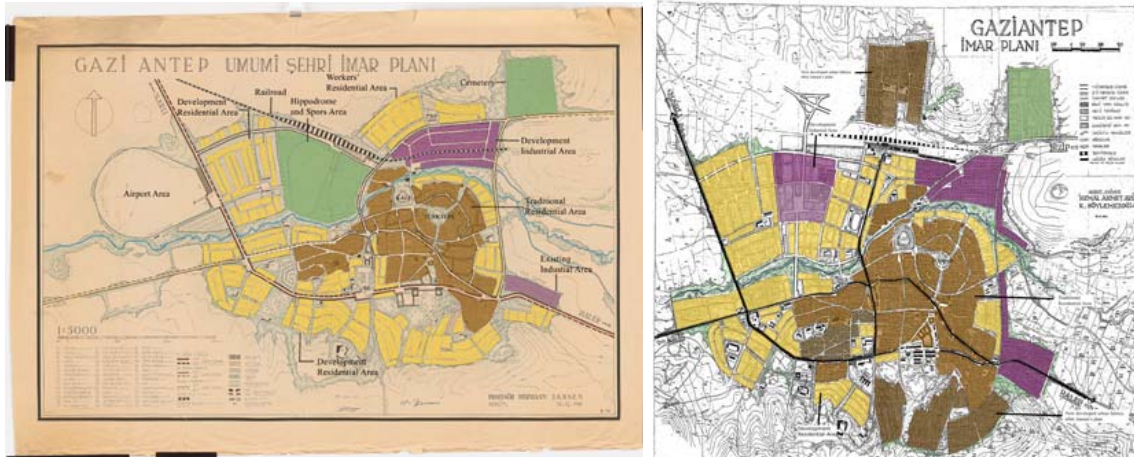
Figure 6. First master plan made by H. Jansen in 1938; **7**. Second master plan made by Soylemezoglu and Aru.
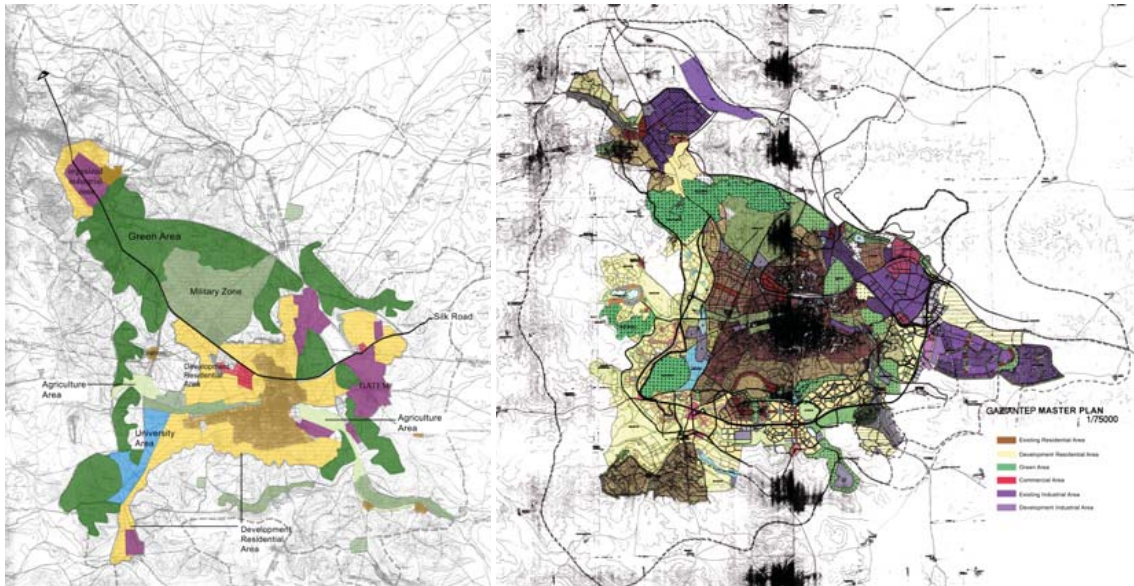
Figure 8. Third master plan made by Zühtü Can in 1974; **9**. Fourth master plan made by Oguz Aldan in 1990.
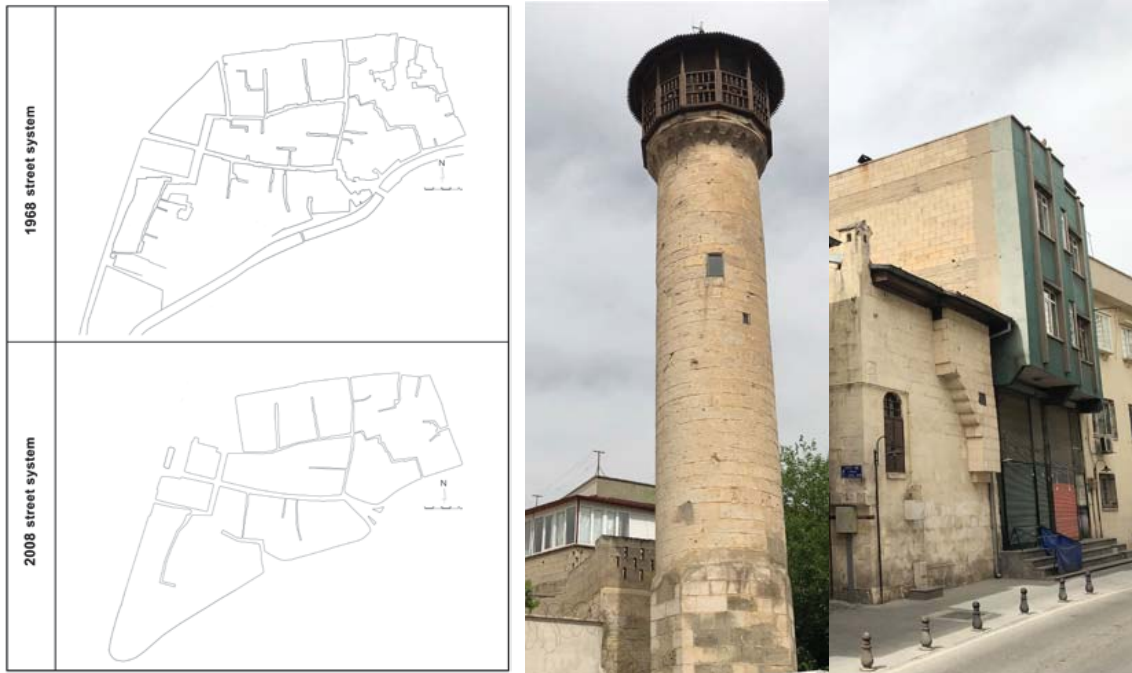
Figure 10. Street system of the area in 1968-2008, prepared by author; **11.** The relationship between the buildings protected buildings in the urban site and the newly built buildings.

Figure 12. Building block-building relationship of the study area in 1968-2008, prepared by author; **13.** The relationship of the old housing pattern to the newly built houses in the study area.

Figure 14. Building-parcel relationship of the study area in 1968-2008, prepared by author.
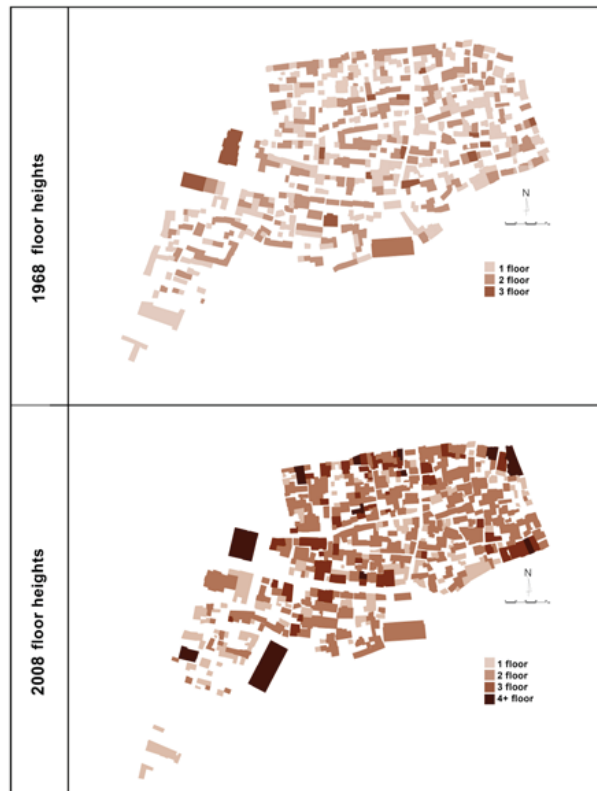
Figure 15. Floor height analysis of the area in 1968-2008, prepared by author.

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Transitional Morphologies in the Global South: Sub-Saharan Africa

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keywords: *Transitional morphologies, informal settlements, Africa, new cities*

Abstract

The accelerated phase of urbanization in developing regions occurred in the last half of the 20th century. Nowadays, a large part of the developing world, labeled as "Global South", is still characterized by rapid urban growth. In these areas, processes that initiate in the margins challenge traditional dependencies of "outsides" from "insides" and definitions of urban, suburban, peri-urban and rural, have become blurry. The term "transitional" refers to elements in the process of change or in the process of "becoming". For this study urban forms in Africas's new (sub)urban scenarios become transitional morphologies to be analyzed. African cities have been catalyzing attention since statistical data show that they will hold about 21% of the world's population in the coming years. This increase in urban dwellers implies a rise in the demand for urban housing, infrastructure, and services. Evidence of the phenomena is tangible, new increasingly large-scale morphologies can be appreciated all over the African continent. Two main morphological singularities coexist in these contexts: informal settlements and new large-scale planned projects. Using geographic information systems and urban morphology as decoding artifact, case studies are analyzed as they develop in time; with the aim to understand their spatial character and the current dynamics of their development. This paper highlights the partial results of an ongoing mapping research project that intends to frame the spatial character of transitional morphologies. In this work, urban morphology serves as a tool that allows emerging morphologies to be mapped and compared.

Introduction

Current social, economic and political changes drive the global urbanization process. This process is creating inequality, uneven spatial development, and increasing socio-economic diversity, within and between, rural and urban regions (McGee, 2013). Meta-geographical visions of the "urban world" animate contemporary discussions but much of what goes for "urbanization" today is not what was seen as such in classical terms of urban extension (Kiel, 2013; 2018). Now, processes that initiate in the margins challenge traditional dependencies of "outsides" from "insides" and definitions of urban, suburban, peri-urban and rural, have become blurry. Statistical data suggest that the 21st century would represent the final phase of the global transition from rural to urban (UN, 2014; 2018, LSE; 2018; Keil 2013; 2018). Since the 18th-century urbanization accelerated in developed regions. On the other hand, the accelerated phase of urbanization in developing regions occurred in the last half of the 20th century. Nowadays, a large part of the developing world, labeled as "Global South", is still characterized by rapid urban growth. Due to the fast population growth and volume of younger populations, these regions have greater challenges to overcome in the coming years (UN, 2018). The number of people living in so-called "urban" settings has increased exponentially in the past century. Population growth and migration are projected to add 2.5 billion people by 2050 to the world's urban population. A major part of this growth is expected to happen in Asia and Africa. Due to poor land-use planning and not enough affordable housing, the rapid urbanization of the Global South is characterized by a prevalence of informal or unplanned urban growth (Mota & Gameren, 2018, Dovey, 2018).

A post-colonial flow of research has appeared in the last years and many scholars, whose research interest resides in the Global South, fight against the idea of the mainstream critical urban literature that uses cities in the South as examples of all that can go wrong with urbanism; instead, many argue for a re-visioning of how these cities are discussed and written about to speak back to theoretical and practical concerns, joining postcolonial theorists' plea for theorizations and examples coming from the South and moving away from a euro centrist view of cities. (Robinson, 2010, Bunnell et al., 2012; Parnell and Robinson, 2012; Robinson and Roy, 2016).

According to predictions, Cities in the African continent will hold more than 1.3 billion pe- ople in the coming years, about 21% of the world's population (UN DESA, 2014). African cities are still typically studied through lenses of development which decisively pushes for references to statistical data. These number seem to be overwhelming and show that the African continent is urbanizing faster than any other continent in the world. This research work focuses on morphological aspects of these overwhelming numbers and for this pa- per, a city in the context of Subsaharan Africa becomes a laboratory of observation of urban forms and the phenomena of urbanization in peripheral areas once considered as "outside" the city.

Transitional Morphologies

The term "transitional" refers to elements in a state of change or in the state of becoming. This term seems adequate to describe the current situation in the African context and is taken as a filter to analyze morphologies in fast-growing cities by including the component of time. With the scope to understand the characteristics of the cities of today, their form and factors that influence it and to understand what kind of urban environments we will have in the future, examples of these transitional morphologies that have been changing and will probably continue to do so in the coming years, are useful to understand the current situation.

One of the main challenges that the African continent faces as a consequence of the rapid growth of the urban population is one of affordable housing. During the last UN- Habitat conference in Quito, affordable housing was identified as a key factor in the goal to achieve sustainable urbanization worldwide (UN, 2018). In the case of Africa, two scenarios (than later can be appreciated in morphological terms) are relevant: the first one is the continuous growth of informal settlements due to the lack of resources and affordable housing, and the second one refers to the phenomena of private investments

in housing and urban developments from foreign and domestic companies that have appeared in the last 20 years.

In morphological terms, these two scenarios are identifiable and extremely contrasting (Fig 1). The first type evokes a more or less stereotypical impression of built environments: complex and high-density alignments of small improvised shelters. Subsaharan Africa is rich in its diversity of forms of informal settlement and has the highest percentage of people living in these types of settlements. (UNCHS, 2001). As for the second type, cases of real estate speculation, tourist enclaves, middle-class residential neighborhoods, closed communities, new capitals, financial centers, and new industrial sites have appeared in recent decades. Some of the recognized transitional morphologies are part of large mega-regions, others are attempts to import urban lifestyles into previously non-urbanized areas (Van Noorloos & Kloosterboer, 2018).

Informal - Formal

The transitional morphologies recognized as part of the contemporary situation can be identified as informal and formal. A general definition of the terms seems relevant as a starting point for the analysis of specific examples where the transitional morphologies are recurrent.

On the one hand, there are informal settlements. In non-morphological standings, in- formality has been studied from an urban, sociological, anthropological and political point of view. Often referred to as "illegal housing" and repeatedly considered as a consequence of poverty, this type of settlement is an important part of the urbanization process in developing countries (McGee, 2013). Usually, the terms "squatter", "slum" and "informal" have negative connotations that are often defined in terms of deficiencies; "…a squatter lacks tenure, a slum lacks space, durability, water, and sanitation; informality implies a lack of formal control over planning, design, and construction." (Dovey & King, 2011). Mike Davis recognizes squatter settlements as one of the symptoms of the ongoing urban global crisis of the developing world and argues that they could be soon labeled as suburbs. (Davis, 2006). The existence of these types of settlements worldwide is also a sign that they represent a crucial element of contemporary urbanization (Bolay, 2006). In areas where land is cheap and unregulated, these types of developments infringe on the countryside that surrounds growing urban centers, these edges of the city are eroded as the city expands horizontally without regulation (LSE, 2018). In this sense, informal settlements could be defined as those where the design, planning, and construction of buildings and street networks emerge without authorization by the state (Roy and AlSayyad 2004). A slum, defined by the UN is a dwelling that lacks basic access to light, space, air, water, sanitation, security or durability (UN-Habitat, 2006). While these type of settlements usually emerge spontaneously, and in an unplanned way, their examination allows understanding of spatial patterns of organization. (Carracedo, 2015)

On the other hand, there are the large scale planned developments that have appeared in the last decades. These developments are often referred to as "African urban fantasies" with outdated, unrealistic and unfair characteristics (Watson, 2014). In an attempt to be showcased as examples of "world-class cities" in the global economy (Roy and Ong, 2011), often these new projects take the form of "New Cities" inspired by Asian and Middle Eastern examples. In some cases, these are projects built up from scratch usually as self-contained enclaves in the outskirts of existing cities; in other cases, city centers are improved and converted into new cities. (Lumumba J, 2013; Van Noorloos & Kloosterboer, 2018). These new developments have been criticized and many have warned that the characteristics of these new projects and their insertion into specific contexts will probably make them unsuitable for solving Africa's urban development problems.

The Case study presented in this paper illustrate processes of (sub)urbanization that invol- ve new developments accompanied by informal ones. In this sense, the recent "African urban fantasies" (formal) and its surrounding (informal) represent transitional morpholo- gies in the making.

Methodology

This study uses examples taken from the most populated cities in the Sub-Saharan area and those where informal settlements are projected to grow the most in the coming years (UNHabitat, 2008). For this paper, an example located in South-Central Africa: Luanda in Angola, is highlighted for analysis. African regions vary in character, local context, history, and unique origins. All the non-physical structures, and yet still tangible, characters present in the context are of extreme importance to frame the current situation of the continent and of every specific area studied. However, for the interest of this study, only morphological characters are highlighted. Formal and informal morphologies indeed carry with them social, legal and economic differences but the intent of this work is not the mapping of social, tenure or economic conditions but morphological and spatial ones. An analytical approach and deductive observation of satellite images obtained from open sources help to define the areas used to exemplify the phenomena.

The presented city is analyzed on different scales (territorial scale and urban scale) and in different time frames. In the context of urban analysis, cartographical images are crucial for the analytical deconstruction of urban formation (Conzen, 1960; Caniggia and Maffei, 2001). A comprehensive representation of the city is the first and fundamental step employed for the morphological analysis in this context. Data from the "Atlas of urban expansion" is taken as a base to understand the expansion of urban forms in 3 periods (1990, 2000, 2010). Urban informality and it's morphological/spatial characteristics rarely appear in official maps, this represents a challenge. Image-based studies of informal settlements through remote sensing have emerged as a substantial research field to develop techniques for detecting and mapping informal morphologies using satellite imagery (Graesser et al. 2012). In this sense, geographic satellite images are used as a tool to gather information for the collection of 3 samples of urban enclaves of 1,5 km x 1,5 km that are taken for analysis (Fig 2.).

The first sample comes from an area consolidated in the center of Luanda, down the co- astal highway and past the fort built by Portuguese colonialists on the hill. The other two samples come from the areas once considered as "outside" the city. The comparison of these samples brings to light interesting characteristics of urban developing dynamics. The approach chosen for the morphological analysis regards the following variables:

1.   Streets and their arrangement in a street system: these elements represent the most stable one of urban fabrics since they show more resistance to urban transformation than plots or building systems (Oliviera, 2016). In these contexts, paved streets are a sign of consolidated infrastructure. In informal settlements, it is common to see that the street arrangements appear as a result of the incremental room by room morphologies.

2.   Formal morphologies, & open spaces in them; the patterns they generate: In an urbanization process, the definition of plots and large division of territory have tangible repercussions in the urban form since they condition future developments in terms of building types, open spaces, and urban landscapes. Generally, the dimensions of street blocks and plots increases as the city grows from its confines of the historical center.

3.   Informal morphologies & open spaces in them. The buildings found in the chosen enclaves represent a tangible way in which building systems are the most recognizable element of urban morphology. Informal morphologies show evidence of bottom-up organization, spatial adaptation, and crookedness.

With the aim to understand the spatial, physical character of urban settlements, the use of urban form as a decoding artifact brings to light interesting observations about the phenomena and the recognized morphological settlements. Advances in geographic information systems and satellite imagery provide tools and images to analyze the changing morphology of cities. The study employs a comparative analysis of the samples in different years. The variables aforementioned help understand how the urban characteristics of the chosen samples change as the city grows. Through the study of an enclave or piece of city in time, effects in the urban form of the city can be deduced. In this sense, the morphology of a city provides a consistent descriptive language for the built environment and facilitates rigorous comparison. The output of this kind of study lays in the applicability of mapping as a generator of knowledge.

Analysis of sample

Located in South-Central Africa, Angola has one of the highest levels of urbanization in the African continent with 63.5% of its population living in urban areas. The urban population density level is also one of the highest in Africa at an average of 6 767 inhabitants per km2 (Africapolis, 2015). Its capital city Luanda counts for almost half of the urban population of the country and is the largest city. The rapid urban growth experienced in this city was part due to the civil war in the interior of the country from 1974 and 1992 causing a displacement of rural dwellers to the city. This city is presumed to be a megacity in the making with a projected population of 8.9 million in 2025 (UN, 2014). The informal settlement's population in the city is very high and was estimated to be 86.5% in 2005, informal settlements are known as musseques. (White et al, 2015).

Samples:

A.   The first sample (Fig 3.) is taken from the consolidated area in the center of the city. The structure of the city is composed of various centers. Administrative structures used during Portuguese colonial rule are present in the area and represent the formal morphologies of this sample. The streets and their arrangement are consolidated. The presence of informal morphologies is limited to the bay area and signs of evictions and relocations of these settlements are present when satellite images are compared. Signs of reclaimed land are also visible and it is in these marginal areas where the development of informal settlements appear.

B.   The second sample (Fig 4.) is taken from an area that showed exponential development in the first years of the 2000s. The connotation of outskirts from the city center made formal housing morphologies to develop as private enclaves. It is only in these enclaves where a durable material is used for the street conformation. On the other hand, the extensive occupation of informal settlements in the area makes evident the need for housing during those years. The density of the informal morphologies in this sample makes open public spaces scarce or even absent, giving the sinuous streets or paths the role of public realm. In this sample and with the diachronic overview of the area it is evident that architecture and urban design co-evolve incrementally.

C.   The third sample (Fig 5.) shows an area furthest to the consolidated center. This area was considered and labeled as rural until 10 years ago; recent urban projects and developments have marked the areas once considered as "outside" with projects of housing constructed for low-income groups. However, when low-income housing remains financially inaccessible, unregulated settlements grow adjacent to formal morphologies that in this case are defined and enveloped in a grid. The parallel development of these morphologies shows two completely diverse ways of living.

Conclusion

The speed and effects of urbanization may bring with them overwhelming issues. Statistic figures could sometimes be beyond comprehension. In this sense, understanding the dynamics of urbanization processes, to later take findings into account for future developments, is one of the greatest challenges society is faced with at the time. The opportunity of seeing the overwhelming changes from a spatial and morphological point of view opens opportunities for new reflections. The current physical conditions of a city are the result of various events that change its morphology in time. The reconstruction of these changes is evident when maps of specific places are compared. In the context of the global south, urban challenges appear to be greater. An effort to look at the elements that constitute cities in these areas is made with this research project to understand the circumstances of the development of the chosen areas. In this sense, cities' current conditions and structure are explained by examining its development.

As for the analyzed city and samples in this paper, the variables used for the analysis de- composed the layers of the urban form in pieces to get a general understanding of how these systems work individually and collectively and how these elements develop in time. The morphological features of the studied urban places can be reduced to a logical system of explanation, which can lead to an understanding of the relationship between urban formal and informal morphologies. This paper highlights only partial

results of an ongoing mapping research project that aims to frame the spatial character of transitio- nal morphologies. Future steps of the research may include smallers samples of each city to be analized and a more strict methodology that would allow the analisis of other cities in the Global South. In this study, urban morphology serves as a tool that allows emerging morphologies to be mapped and compared.
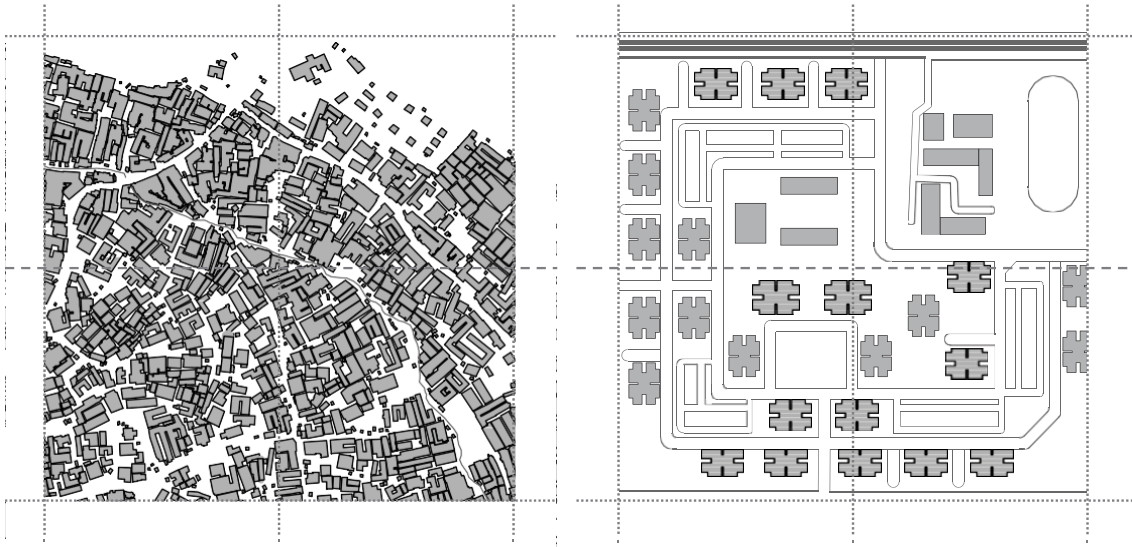
Figure 1. Morphological singularities recognized in the African urban context. Left: Kibera Slum, Kenya. Right: Kilamba new town, Angola.

Figure 2. Luanda, Angola. Territorial scale, general street configuration and samples.
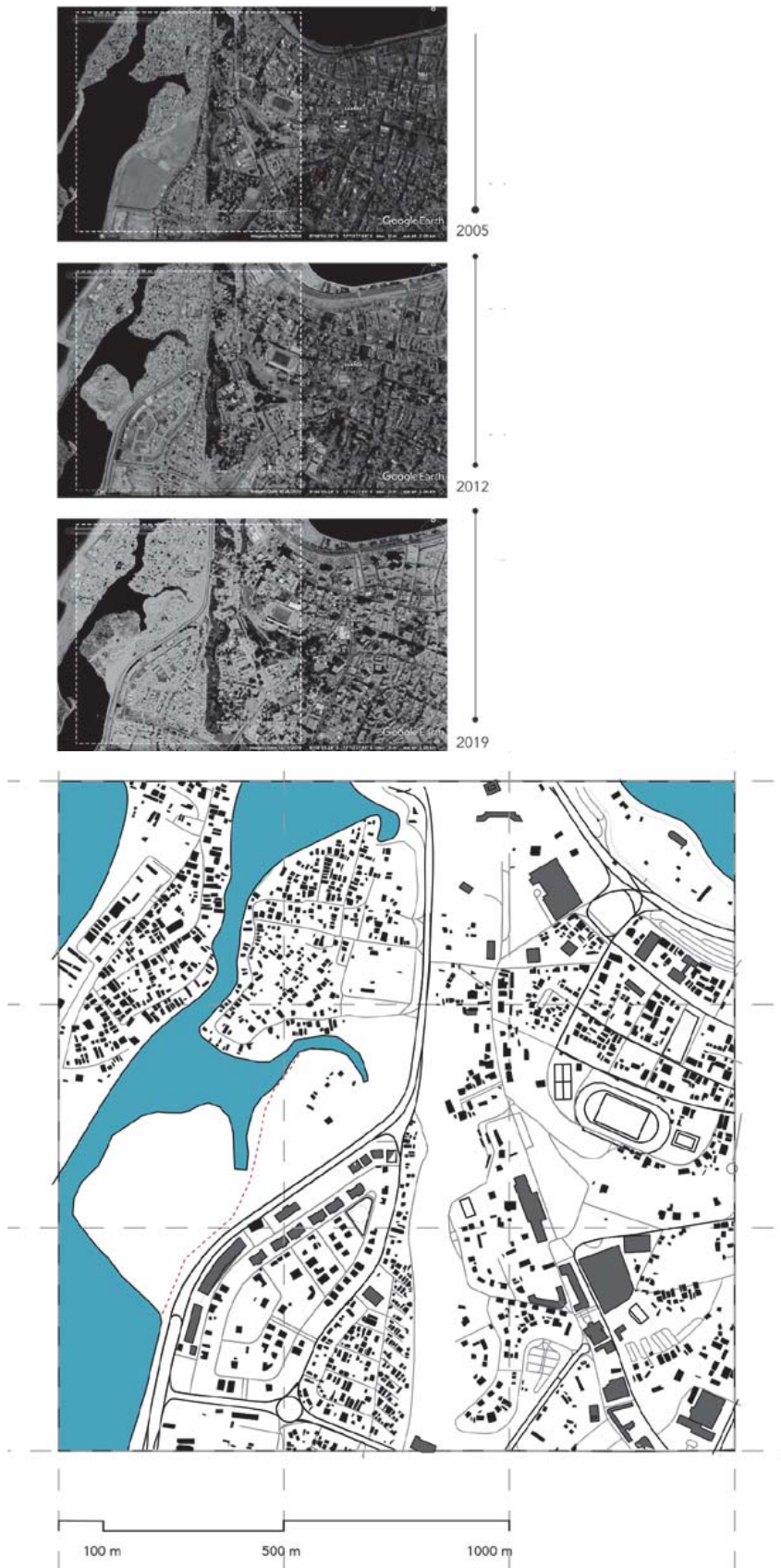
Figure 3. Sample A, urban scale & diachronic analysis.

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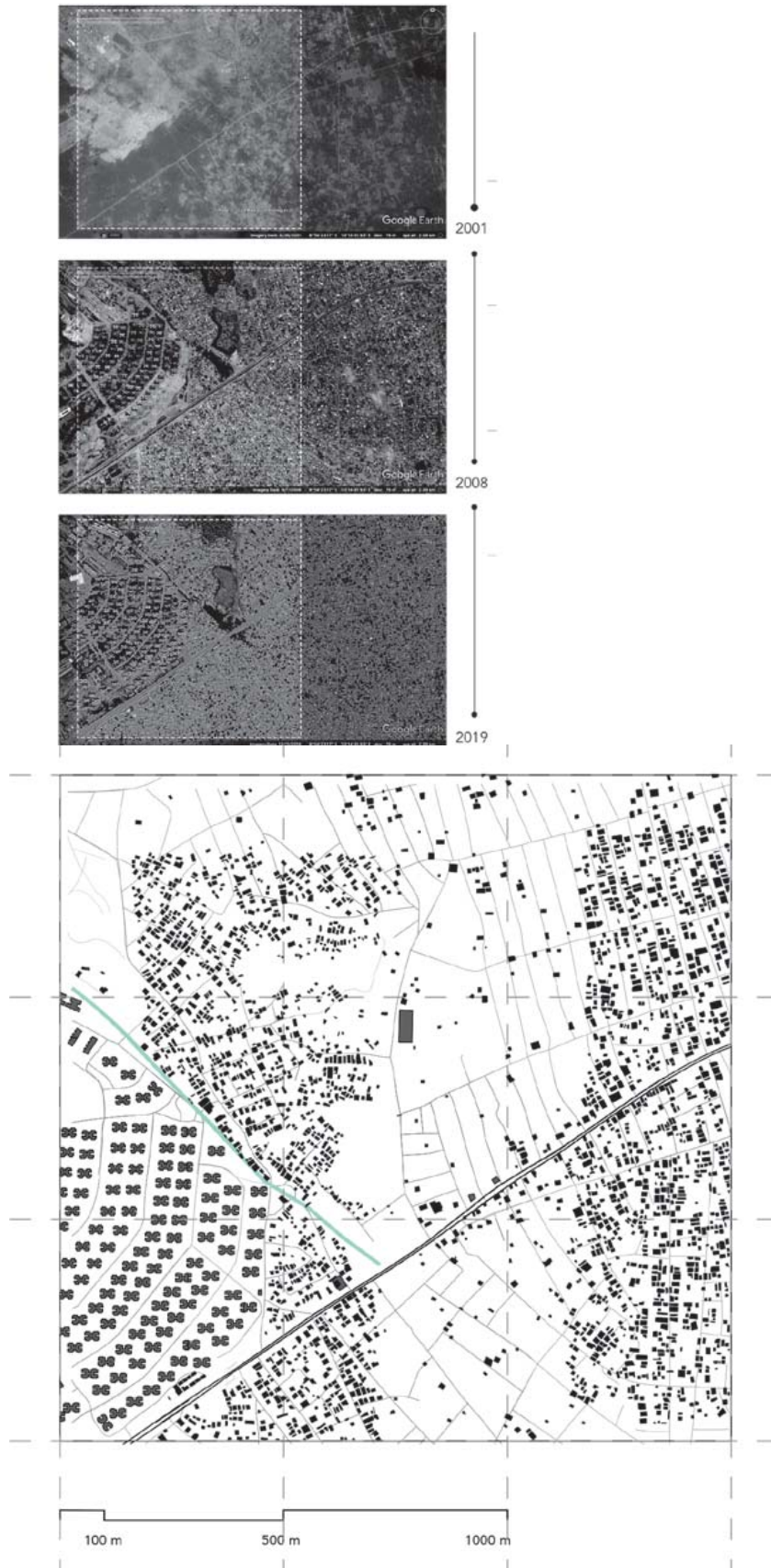
Figure 4. Sample B, urban scale & diachronic analysis.
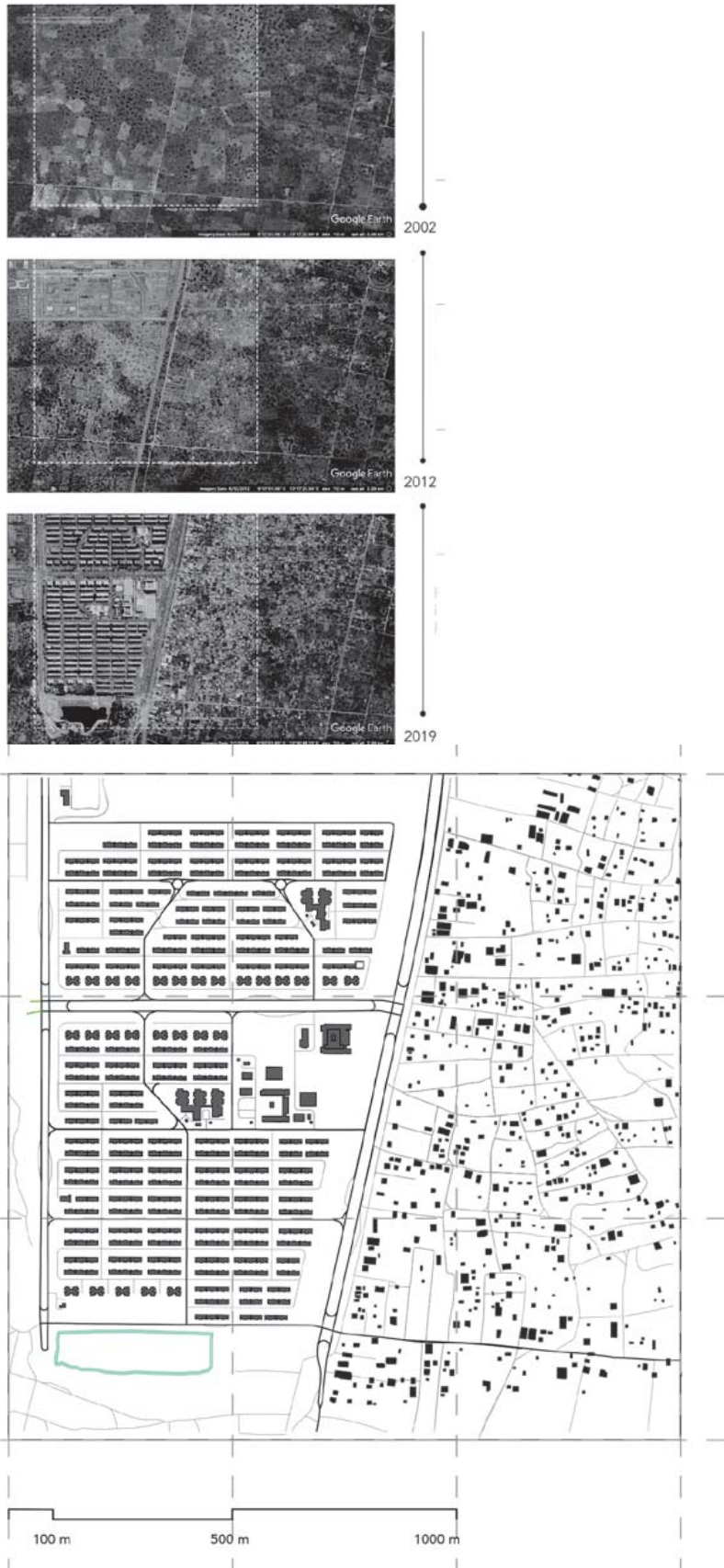
Figure 5. Sample C, urban scale & diachronic analysis.

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Morphological specific features of postindustrial small towns

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Keywords : *Perm region, single-industry towns, monocities, urban fabric*

Abstract

The article presents research of small postindustrial cities in Perm Region in a retrospective of state urban planning policy. On the basis of archival and town-planning data the question of spatial transformation of industrial cities was studied. The influence of the city-forming enterprise on the development of urban morphology is shown. Single-industry cities are a global trend of industrialization in the late XIX - mid XX centuries in particular countries. In Russian practice these territories are usually called "Monotcities". Until the end of the 1920s, Russian monotowns were built as a "factory-city" and formed the space of the city around the plant. The functional zoning changed with the appearance of the "Garden town" and a "Socialist town" concepts (Milyutin, 1930; Meerovich, 2016). Since the mid-1950s the principle of microdistrict planning (Stanilov, 2007) has been actively introduced, as a result, urban fabric becomes more "friable" with low connectivity. The downtown is obtaining uncertain features. Small industrial towns in Perm region have the characteristic traces of the Soviet period of urban development, in which the morphological structure was submit to the enterprise and frequently had no human scale. The transition from a public administration system to market relations has had a significant impact on changing urban morphology. The scale of transformation in monotowns is both general and unique. The article contains reflections on the impact of state urban planning policies on the texture of urban fabric of monotowns, formed in various historical contexts.

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Introduction

According to the official documents, there are 1112 cities and towns in Russia today. More than 70% are small towns, including urban-type settlements. Part of small towns, the so-called 'single-industry towns' or 'monocities', emerged and existed due to single enterprises or industries ('company towns' in the terms adopted in foreign science). There are about 319 urban settlements where 15,950,886 people live (data for 2018). These territories vary in size, population, type and pattern of development. Their main common feature is the presence of a factory in its the territory. On the one hand, this factory was the source of development for the town; on the other, the city became fully dependent on it.

The emergence of this type of city is a global trend of the late 19th - mid 20th centuries, i.e. the period of industrialization.

In the Soviet Russia the phenomenon of a company town was massively widespread due to the plan economy (Zubarevich, 2015) and the doctrine of administrative territory division (Meerovich, 2018). Most such towns emerged against the background of a new legislation format introduced in 1930s, external political threats and the creation of the GULAG system.

The World War II escalated the emergence and development of such cities. This explains their location, their specific layout and ineffective resource management (Hill and Gaddy, 2007).

Many towns founded during the Soviet period experienced serious violation of the natural process of city development. Many cities were built in places where no city should exist – in severe climates and almost inaccessible locations (like Siberia and the Urals). The main factor determining the emergence of a new settlement was industrial production, and that was the only purpose town planners had in mind. The influx of the population was often forced. Thus, the evolutionary process of city development was disrupted. As a consequence of the above factors, after 1989, when the system of management and control changed in Russia, those small city faced huge problems associated with their urban space.

To study the transformation of the urban fabric of these settlements, I used retrospective and cartographic analysis, studied urban planning documentation and conducted field studies of single-industry towns of the Perm Region.

Case-study: the monocities of the Perm Territory

In the Perm Region, out of 25 cities, seven cities have the official status of a monotown, and out of 28 urban-type settlements, three are considered to be single-industry territories - Tyoplaya Gora, Pashiya, Uralskiy.

From table No. 1 it is clear that the monocities in Perm Region were formed from historical settlements and redeployed for military purposes, their existing industrial enterprises expanded (Tyoplaya Gora, Pashiya, Yugo-Kamskii, Chusovoy, Nytva, Ochyor, Aleksandrovsk) or new ones were built (Krasnovishersk, Gornozavodsk, Uralskiy).

A characteristic feature of monotowns in the Perm Region is the blurring of their boundaries. They have been changed at least 3 times since the 1990s as a result of numerous municipal reforms in the Russian Federation. The exceptions are Ochyor and Uralskiy.

Monocities in the Perm Region are generally both typical and at the same time unique to Russia. Most of them were founded in the late 1920s, around the industrial enterprises founded before the Revolution of 1917 (Turgel, 2010). Thus, one can trace the tendency that most of the Perm city factory towns that existed before the Revolution were subsequently transformed into Soviet single-industry towns. And, to varying degrees, retained the features of the original settlement: the old factory, the old city, the pond.

In single-industry towns based on pre-revolutionary factory settlements, usually there were two centers: the old one, which consisted of the factory, a pond and the administrative center surrounded by residential buildings; and a new one, which emerged with the reconstruction of the old plant or its new construction at the same or another location (figure 1).

It should be taken into consideration that in the first half of the 19th century, all pre-industrial towns in the Kama region, including the provincial town of Perm, were relatively

small (from 1-2 to 10-15 thousand people), built up mainly by wooden one-story houses, most of which had yards with outbuildings, like stables, bathhouses, woodsheds. The houses had kitchen gardens in their back yards. Many house owners kept poultry or even cows that grazed on urban pastures. The streets had neither hard surfaced pavement, nor sidewalks, nor artificial lighting, water was taken from wells and natural water bodies, and the waste was also dumped there. The industry was represented by small manufactures and craft workshops that used manual labor, and most of the trade operations were carried out by small stores and at fairs that were held several times a year. Only the existence of several large stone churches and administrative buildings characterized those towns as urban settlements, not rural ones (figure 2).

Russian industrialization of the second half of the XIX–early XX centuries led to the emergence of new industrial enterprises using modern machinery and technology. Some of them arose at the site of old plants, some appeared at new locations, e.g. in coal mining districts that produced fuel for both metallurgy and electric power plants. The layout of factory towns in this period was usually neither beautiful nor comfortable; it was often quite primitive, practically without social infrastructure and even amenities. However, there were exceptions.

One of the richest Perm entrepreneurs of the post-reform era, Ivan Lyubimov, hired the famous Perm architect A. Turchevich to build a village for the soda plant in Berezniki (a joint Russian-Belgian enterprise, at that time the largest factory of the kind in Russia). Each building in the village was built to a special project, workers' apartments had running water (Kurjakova and Galyautdinov, 2016). The settlement impressed contemporaries with the cleanliness of houses and streets, well-developed infrastructure, which included, in addition to the residential buildings and factory management, a school, a hospital and even a theater.

This working village, nicknamed "Little Belgium", was rather a unique example of paternalism than typical of the Perm Territory of that period. After the revolution, the territory of the "Little Belgium" was used for industrial purposes for a long time, which ultimately made this territory completely isolated from the city life. Recently, the issue of reconstruction of this historic place was suspended due to industrial pollution of the territory, the accident rate of the buildings and the isolation of the site from modern housing development.

Such a policy of paternalism became the basis of the idea of the 'garden city' of Harvard. At the beginning of the 20th century, the idea of a "garden city" was also picked up in Russia, but, according to Meerovich, the tsarist government could not accept this concept for fear of the development of autonomy and civil society in Russia (Meerovich, 2017). Later this idea was adopted by Soviet constructivist architects and embodied in the construction of socialist towns (Milyutin, 2008). During the first Soviet five-year plans epoch, the concept was subjected to the ultimate functionality of the residential development, when the whole city life was subordinated to the enterprise and depended on its prosperity. Thus, the monofunctional structure of the city was formed with a clear division into industrial, sanitary-protective and residential zones, with recreational zones lining their edges. This urban planning method was implemented in many Soviet cities, especially those built from scratch, e.g. the town of Gornozavodsk in the Perm Region (figure 4). A mandatory design requirement was the presence of a sanitary protection zone between the industrial territory and the residential area (usually 1 km) and the creation of a buffer zone, including greenering, storage or transport areas.

The downtown is characterized by the features of the Soviet urban planning and design: the network of green spaces laid down in the 1940s is visible, the central planning area has low-rise buildings and human scale, pedestrian connections are developed.

The central part of Gornozavodsk, built before 1965, is characterized by two or three-storey houses with outbuildings. As shown in the photo from the urban development strategy, the development area is compact, formed along the street lines (figure 5).

The phased development of the city is reflected in the planning and architectural monotony of blocks, characteristic for each construction period, and also by the incom-

pleteness of the road network. Dependence on factory utility networks influenced the fact that multi-storey buildings did not spread beyond the river. Today, the city is divided into three parts by linear objects: the industrial zone is cut off by the railway in the north (figure 3), followed by a an area with multi-storey buildings which is also cut by a linear object - a river (figure 3). Next is a low-rise buildings area with individual houses, which is cut off by the federal high-speed highway from the residents' dachas and a microdistrict 'Druzhba' (figure 3).

At the same time, a compact and otherwise walk accessible city is limited by difficult barriers that make the urban environment more inaccessible to people.

In the mid-1960s, in the eastern part of the city, there appeared a block built up with the khrushchevkas, with huge courtyards. This territory is now abandoned, as it became less attractive than the central part of the city due to the lack of improvement and the boring appearance of the buildings. Currently, freestanding trade pavilions covered with yellow siding are being built on the wastelands.

The western part of the city was built up in the 1980s by builders from DDR. These are more densely built-up neighborhoods with five-storey houses with an improved layout of apartments, which is why many residents still seek to move to this part of the city.

In general, the city developed along the perimeter of the blocks with large courtyard spaces intended for future infill construction. In the 2000s, this allowed erecting several high-rise apartment buildings within the planning structure of the neighborhoods. Typically of this period of economic changes, this development lacks in courtyards, public spaces and has a chaotic road network (Bushmakova and Shorkina, etc., 2019).

Today in Gornozavodsk there are many wastelands, garages and sheds, as well as abandoned buildings and apartments (figure 4).

The functional zoning of cities was applied everywhere. This approach was used not only in new but also in existing cities. The structure of the pre-revolutionary city was changing in a top-down manner. A comfortable, low-scale building typology was replaced by panel microdistricts even in settlements with obvious village features, which also manifested itself in inadequate building density and the destruction of comfortable urban blocks.

While previously the main forming elements were a factory, a pond, a market square and churches, in the post-revolutionary period the city center became less pronounced. In addition, some of the historical buildings (for example, churches) were demolished or converted to functions unusual for them. In the Russian urban planning tradition, most churches were built on the highest or busiest location and were the silhouette-forming dominant of the settlement. To date, these buildings have been lost, and it is often not possible to restore the compositional integrity due to the displacement of the business center of the city or the large financial costs of reconstruction (figure 5).

Due to the change of ideology, the pre-revolutionary approach to the formation of urban "sacred places" was replaced by the Soviet one, where memorials in honor of the heroes of the October Revolution and the WWII dominated, combined with palaces of culture and monuments to Soviet leaders (figure 6).

A new type of public spaces was formed that was significant for the citizens: a square in front of the industrial enterprise. Today this public space is losing its significance in urban life due to the decline or the closure of the city-forming enterprise (figure 7). Monuments are replaced by others with a more historical theme, squares are converted into parking lots and transport hubs, but sometimes into quiet green spots.

The town-planning and historical features of Russian single-industry towns distinguish them from other countries, since most of them are the legacy of the Soviet era, when urban planning

policies were mainly determined by the military and strategic interests of the state. The organization of comfortable conditions and concern for the welfare of the population were not as important as the maximum production output, primarily of raw materials and products of the military-industrial complex (Meerovich, 2016; Stanilov, 2007). The main factor determining the emergence of a new settlement was an industrial enterprise and its successful development (Zubarevich, 2015). The master plans for small settlements ini-

tially included a standard minimum of social and communal facilities: a school, a clinic, a kindergarten, a club, a boiler house, a bathhouse, a shop (figure 8).

The post-war phase of urban planning and development in the USSR is characterized by intensified urbanization (Lappo, 2004).

Accelerated urbanization has led to the situation when the majority of Russian modern cities have vivid 'rural features': individual dachas around the city edges and even agricultural buildings located inside the city (figure 9). The influx of huge masses of people from rural areas who had no time to join the urban way of life, to master and accept urban values, led to the formation of the significant number of residents who have a semi-urban lifestyle (Pivovarov, 2001).

For example, today the Gornozavodsk city center looks neglected due to dilapidated facades and buildings in which residents keep their stuff and raise chickens. Gardening plots were designed by urban planners deliberately: according to the 1947 master plan, all apartment buildings were provided with household plots of 1000-1200 m2 for kitchen gardens and sheds for keeping goats, pigs and chickens.

The overestimation of resettlement and the underestimation of its social content were characteristic of town planning activities. In particular, they are evident in the General Scheme of Settlement in the USSR in the 1970-1980s and other state documents on urban planning prospects (Kiteleva and Lorenc, 2017). It should be kept in mind that the construction of monocities during the first and second waves of Soviet industrialization 'from scratch' meant complete absence of any cultural tradition on their territory (Meerovich, 2018).

The patronage system of city-forming enterprises and dependence on them have led to the fact that the population is passive and not accustomed to actively participating in the process of modernization of the cities in which they live and work.

The issues of providing comfortable housing and infrastructure to the main part of the urban population were partially resolved by the early 1970s as a result of the widespread introduction of mass panel construction and the inclusion of urban development in the responsibilities of city-forming enterprises (Potapov, 1984).

In most cases, employees of city-forming enterprises lived in residential buildings belonging to and run by those enterprises. Such social infrastructure as boiler houses, kindergartens, clinics, and educational institutions were maintained by enterprises, too.

The abrupt transformation of the 'command'

system into the 'market' system changed all system into the 'market' system changed all spheres of life including urban planning. The beginning of the 1990s was characterized by a legislative crisis in the urban planning sphere, uncontrolled massive spread of unauthorized residential development and redistribution of property, which has now aggravated the problems of Russian cities (Slepuchina, 2014). In addition, existing residential and public buildings are declining due to the lack of proper maintenance, major repairs and reconstruction. The problem also lies in the fact that most buildings in small towns were built in the short post-war period, which means that they all are deteriorating simultaneously. (Batunova and Gunko, 2018).

The refusal of enterprises to maintain objects of social and communal infrastructure posed a challenge to city administrations: they were obliged to buy these objects from the enterprises or to build their own. Many cities ceased to need the whole range of existing social facilities due to a decrease in the population or lack of funds in the budget. Often, the most important urban facilities were purchased not by municipalities, but by individuals and commercial organizations that were not interested in preserving their original function. The issue was not regulated by law; as a result, buildings were redesigned according to their new owners' desires. The land plots around the buildings could be surrounded by fences, making previously accessible territories closed to citizens. In other cases, where the issue of property remained unresolved for a long time, buildings were destroyed, and land plots fell into disrepair, which also negatively affected the structure of urban fabric. Until now, in small towns, ownership of most territories, especially public spaces, has not been established, A fragment of the cadastral map shows that in the center of Yugo-Kamskii many sites near apartment buildings are not delimited, which leads to the appearance of abandoned wastelands (figure 10).

The conclusions

The study of the structure of the urban fabric of single-industry towns of the Perm Region has revealed the following problems: the lack of clearly defined center and boundaries of towns, districts with simultaneously deteriorating buildings, and the destruction of historical heritage.

In the context of a declining population, modern development is sprawling, and abandoned zones appear within the city.

A characteristic feature of postindustrial cities is the lack of interaction with water spaces, since the river banks are occupied by former enterprises and are therefore closed or unsafe for residents.

The changing role of the industrial enterprise in urban life has had a negative impact on the urban fabric, starting from the dilapidated factory entrances and ending with the destruction of buildings in the factory territories. In addition, in the XX century specific industrial landscapes were formed, such as rock dumps, dams, buffer zones, which negatively affect the perception of the town and make it less penetrable.

In terms of urban environment, the single-industry towns of the Perm region suffer from the monotonous development of the Soviet period, with little emphasis on unique features associated with history and landscape.

An analysis of the General plans and maps of the settlements of the single-industry towns of the Perm Region revealed a tendency to preserve urban planning approaches of the late Soviet period and the era of modernism. The town planners seem assured that the population will always grow and the city-forming factory will always prosper. They create monotonous functional zones and do not provide infrastructure to meet modern standards.

As a result of the uncontrolled land development, the quality and value of urban space are diminished:

- local budgets do not have enough means to maintain the huge areas of urban spaces and streets, which leads to the degradation of their condition.

- the fragmented urban fabric forces residents to use transport, often on personal vehicles;

- due to fragmented urban fabric, the density of population and specific distribution of workplaces, it is impossible to efficiently use the existing and newly created urban infrastructure, street network and social facilities.

Given the limited town budgets, this leads to a decline in the communal infrastructure and a degradation of the urban environment. The situation is worsening every year - since 1990, Russia has already lost more than 23,000 settlements, and this trend continues.

To retain towns and their urban fabric, it is necessary to revise key approaches in Russian urban planning policy and start working with urban environment, rather than individual objects. In particular, it is necessary to understand the nature and potential of degrading inner-city territories and use them as a resource for saving the urban fabric.

Table 1. Monocities of Perm Territory

No	Name of settle-ments	First mentioned	Date of city status	City-forming enterprise	Distance from Perm, km	Population
1	Tyoplaya Gora	1880	1928	ZAO «Teplogorskii shchebyonochnyj kar'er» (gravel pit); Forest industry	244	2884
2	Pashiya	1784	1929	Pashiyskii Metallurgical and Cement plant	179	3606
3	Yugo-Kamskii	1746	1929	Yugo-Kamskii Machine Building Plant	56,5	8019
4	Chusovoy	1804	1933	Chusovskoi Metallurgical Plant	140,8	45 291
5	Nytva	1756	1942	Nytvenskii Metallurgical Plant	74,7	18 804
6	Krasnovishersk	1894	1942	Visherabumprom (paper factory), Uralalmaz mine	315	15 587
7	Gornozavodsk	1947	1965	Gornozavodskce-ment (cement factory)	179,6	11 477
8	Uralskiy	-	1948	Perm plywood mill	69,5	7699
9	Ochyor	1759	1950	Ochyorskii Machine Building Plant	141,6	14 240
10	Aleksandrovsk	1783	1951	Alexandrovsk Machine Building Plant	240,5	12 841

1. Old factory   5. New center
2. Old city   6. 'Stalin's' blocks
3. Private housing   7. Mass production houses
4. New factory   8. Station
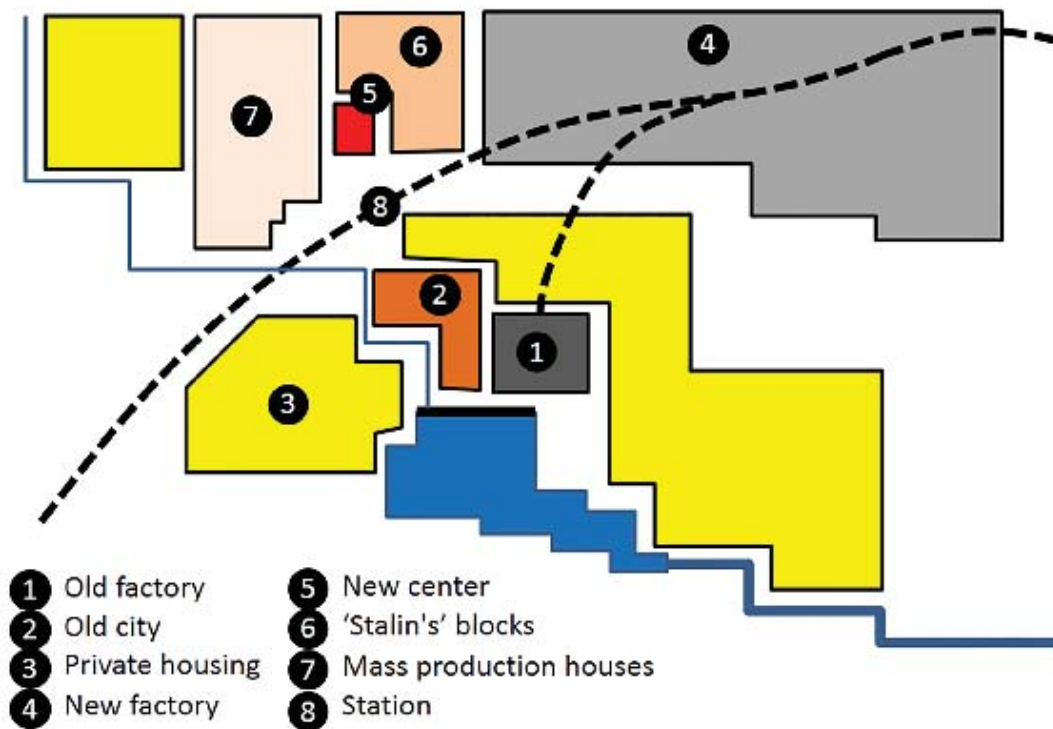
Figure 1. Town-planning portrait of a monocity.

Figure 2. An example of a "pre-industrial" era town (S. M. Prokudin-Gorsky, 1912).

Industrial zone of Gornozavodsk

High-rise area of Gornozavodsk

Low-rise area of Gornozavodsk

Figure 3. The fuctional zones of Gornozavodsk city.

Legend
- water
- marshland
- emergency buildings
- garages and outbuildings
- wastelands
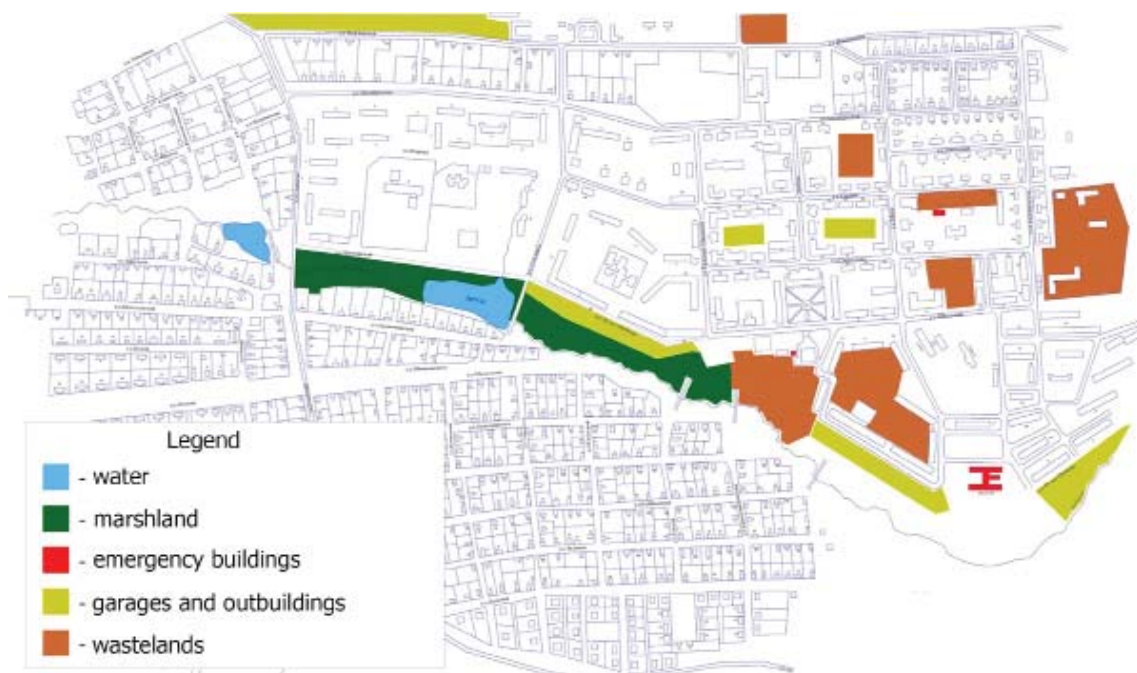
Figure 4. - The Scheme of identified wastelands and emergency buildings in Gornoza-

Figure 5. The loss of silhouette-forming dominants: the historic and nowadays view of Holy Trinity Church in the town Yugo-Kamskii.

Figure 6. 'Sacred places' in the Soviet towns: the central alley with the monument to V.I. Lenin (Gornozavodsk), the Palace of Culture (Chusovoy), the Monument to the Heroes of the War (Ochyor).

Figure 7. The present view of the factories squares (monotowns - Yugo-Kamskii, Uralskiy, Chusovoy).

Figure 8. The fragments of the General plans for the monocities of Uralskiy and Gornozavodsk.

Figure 9. The outbuildings in Gornozavodsk, 2019.
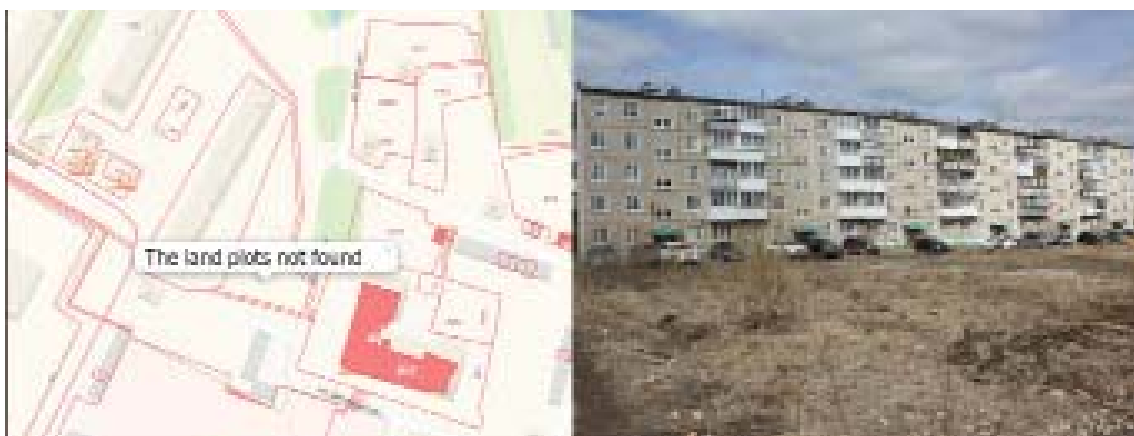
Figure 10. An example of a cadastral map of Yugo-Kamskiy settelment showing unproductive land property and a photo of the object.

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Gridded Urban Morphologies, sub-Saharan Africa and Senegal: Research Historiographies and Present-day Realities

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Abstract

In Western (Eurocentric) research traditions of urban and planning histories, sub-Saharan Africa is generally denied an urban past, an urban settlement-design culture, and especially an indigenous practice of grid-planning. It is against this state of research that indigenous grid-pattern settlements in Senegal are analyzed in our paper, with relation to the gridded tradition of (post-)colonial settlement-design. The paper demonstrates that urban grid-planning emerged independently in Senegal, before European colonization, while also shifting the discussion from morphological essentialism regarding the genealogy of the grid towards a more interactive, poly-centric and processual approach reflecting present-day realities. The sensitivities inherited in African Studies will be also brought to the fore, as developed against the background of the historiographic tendencies that characterize Islamic Studies, World History, (Global) Urban Studies and the current literature on grid planning. The paper therefore provides a critical overview of the research atmosphere in various interfacing fields, giving special attention to global North-South relations. A series of past and contemporary important urban centers (mostly Sufi) in Senegal will be examined, employing rich and variegated methodology, sources and fieldwork. Through a focus on grid plan literature, the enduring need to de-Eurocentralize global urban history will be highlighted, while proceeding towards a more inclusive, integrative and hybrid post-colonial urban planning cultures.

A note on historiography

Dealing with histories and geographies of urban planning in sub-Saharan, Islamic Africa means embracing a critical perspective while positioning Africa at the intersection of Islamic Studies, World History, and (Global) Urban Studies. However, Africa is still poorly positioned in this scholarly landscape, a legacy of the continent's political-economic marginalization in modern times. Being among the first to discern this scientific marginalization, Africanists have long called for a research agenda able to rectify the bias. "In the field of Islamic studies" writes Eric Ross, "Africa has been seen in a passive role, as simply receiving Islam. Islam is always *in* Africa, but there never seems to be any Africa *in* Islam" (1994, p. 2). Similarly, argues the art historian René Bravmann, "Africa and Islam have surely made something of each other that is quite extraordinary, if only we care to look" (2000, p. 490). And, according to the world historian Patrick Manning, "authors of world-historical monographs and syntheses have yet to find ways to present Africans of the continent or the diaspora as participants in global affairs in a proportion approaching in a way their place among the numbers of humans" (2016, p. 625).

At the same time, established scholarship on urban planning history is centered on the European experience, first that of southern Europe (in antiquity) and then that of Western Europe and North America (in the modern era). While a few other city-building traditions – those of China and the Islamic Middle East in particular – are also recognized as valuable to the discipline, this value is contextualized as somehow peripheral, as lying in the past and having been comprehensively superseded by modern practices that spread from Europe. Perhaps more so than any other major world region, sub-Saharan Africa is almost entirely excluded from the world historical narrative of urbanization. A few select parts of the continent, such as the Niger Bend, and the Hausa, Yoruba and Swahili city-states, are included at the periphery of medieval Islamic city-building. But otherwise sub-Saharan Africa is generally denied an urban past, denied its own history and culture of urban design, and entrapped in a bucolic image. Even after the end of colonialism, as noted by the Africanist historian Catherine Coquery-Vidrovitch, "western urbanists tend to postulate the 'modern' colonial or contemporary city as an innovation in Africa." The reason for this, she explains, is that "consciously or not, but always implicitly, there is a presupposition that the only fully developed urban model is the Western standard of reference" (2005, pp. 12-13).

Grid plan historiography and Africa

Globally, the history of the urban grid embraces multiple regions and time periods. It is also connected with a variety of forms of political, economic and social organization, ranging from egalitarian to more centralized and authoritarian regimes. As noted by the urbanist Peter Marcuse, "the same form can be produced by quite different interests whose conflicts result in quite different compromises"; and likewise "similar interests can produce quite different city forms if their histories and the compromises they reach are different" (1987, pp. 289-290). Jill Grant (2018) has conducted an historical survey that demonstrates this point by classifying the political structure of societies that have implemented the grid plan as a dominant form in city building. Her study shows that, while the grid was implemented in some rather egalitarian societies seeking to diffuse authority among citizens, it was most commonly used in societies which had centralizing or globalizing power. Thus, the extraordinary symbolism of the grid as a rational built form imposed on landscapes can convey a range of meanings and interests, both positive and negative.

Historically, grid plans have been implemented since ancient times. The city of Mohenjo Daro in present-day Pakistan and Egypt's Middle Kingdom pyramid town of Kahun both date to the third millennium BCE. Since, grid plans have been implemented by the ancient Assyrians, Greeks and Romans, in imperial China, in the medieval *bastide* towns of southern France and late medieval England, in Renaissance Italy and Germany, and in colonial America, both North and South (Kostof, 2001). Yet the literature on grid planning, particularly in the medieval and modern eras, associates this spatial practice exclusively to the exercise of power by European territorial states, both at home and

especially "overseas" in the colonial periphery. Grid planning thus becomes inseparable from Western "modernity" and rationality. Colonial cities – normally laid out on the grid plan but also on other designs – are perceived in the urban planning literature as a direct continuation of European modes of planning beyond Europe. This is true concerning the Portuguese, Spanish and French colonization of the New World, the later westward movement of settlement across North America, and other colonized places in Asia and Africa (e.g., Culot and Thiveaud, 1992; Maza, 1965; Morris, 1994 [1972]; Pinol, 2003; Pinon, 1996; Reps, 1970; Romero, 1976; Stelter, 1993).

As a result, it seems that urban planning literature has absolved itself of having to deal with non-Western planning cultures, or with their possible long-term interactions with Western colonial cultural. The introduction of the grid plan in colonized countries has been described in this literature as occurring in a spatial *tabula rasa*. "Baptized" by the grid, colonized regions globally were "whitened" and could enter the mainstream of urban history. This Eurocentric view has persisted in some classic planning history textbooks. Nothing is said in these textbooks about Native American, Indian or African planning concepts and their possible interaction with the colonial counterparts. This epistemological gap applies broadly to urban history in colonial and post-colonial North America, South-East Asia and sub-Saharan Africa. Those who study the global history of grid planning have completely ignored Benin City (Edo), the capital of the greatest rain forest kingdom of Africa, now in the coastal interior of Nigeria. Consolidated by the twelfth century, the kingdom flourished between the fourteenth and seventeenth centuries, to be later weaked by a civil war (1689-1721) and British destruction and annexation (1897). According to seventeenth-century oral traditions, written accounts of European visitors in a variety of languages (Ben-Amos and Thornton 2001), and archaeological evidence (Darling, 1984) - the city's streets were laid out as a radiating grid system, originating from the king's palace. Similarly, nothing is said about the city of Loango, capital of one of the oldest and largest kingdoms of the southern area of today's Republic of the Congo (Brazzaville). Established near the Atlantic coast in the thirteenth century by the Vili (Bavili) people, it became a major trading state importing ivory and slaves from the hinterland. Based on the accounts of European travelers, its main streets were wide, long, straight and clean; they met at right angles and led to the gates of the surrounding wall (Thornton, 1983, p. 91).

"In West Africa", says the art historian Mark Hinchman, the grid plan "represented the West, a city pointedly not African. In order for the grid-as-myth-of-the-West to function, a great deal of repression needed to occur, foremost the knowledge of many African traditions of rectilinear architecture" (2012, p. 307). Still, his study of Senegal which overrelys on colonial sources seems to be unaware of indigenous spatial practices, and of the fact that various elite Wolof social actors were implementing grid plans independently of colonial forces. The Senegalese case presented here shows that at various times and in different locations, the grid plan model was deployed by royal courts to help actualize secular authority and aristocratic prerogatives, by Sufi orders to promote proper Islamic conduct, and by the French colonial authorities to foster the rational exploitation of agricultural resources. All three types of agents were powerful political and social institutions able to act decisively on the territory. While Senegambia's *ancien régime* kingdoms and the French colonial administration were straight-forwardly political institutions of the highest order (being types of states), the Sufi orders are not. The exercise of authority by Senegal's contemporary Sufi orders has been well studied (Villalon, 1995). Both the Sufi orders and their individual leaders (sheikhs) are generally recognized religious authorities (Senegalese sheikhs consider themselves "moral" authorities), and it is also generally accepted that their religious authority extends into the social, economic and political spheres of Senegalese life. At the height of the colonial system, when new Sufi settlements mostly linked to the peanut economy were proliferating, the authority of the Sufi orders was already firmly established (Robinson, 2000). Given that the colonial authorities lacked the resources to police or service rural localities directly, such authority was conveniently left in the hands of the local sheikhs and the Sufi orders they were affiliated to. The sheikhs were thus able to implement a variety of policies (in religious

education, in agriculture, in urban design) in the localities under their control with little interference from the colonial state. Since independence in 1960 the Sufi orders continue to exercise a measure of de facto authority within society and the public sphere. They have used, and continue to use the grid plan to foster their spiritual and actual authority and to build a sense of both community and identity among their followers (Ross, 2006; 2012).

The grid plan and Senegal

Grid-planning is deeply rooted in the history of settlement design in the Senegambia region. Its implementation there predates the introduction of Western grid-plan designs by the French during the colonial era. The grid plan was already applied in the sixteenth century in the laying out of the royal capitals in the Empire of Jolof (e.g., Maka, Kahone, Diakhao and Lambaye) (Figure 1), and was then embraced by Muslim clerics in the seventeenth century for the establishment of autonomous centers of Islamic instruction. Towns established by the Jakhanke clerics, famous for the quality of Islamic instruction they dispensed in the Western Sudan region, such as Diakha-Bambukhu, Bani Isra'ila, Didécoto and a new Gunjur, were gridded. Though there are no contemporary plans of these clerical towns, oral histories and their current layouts indicate that they, like the royal capitals, were laid out according to the endogenous grid-and-*pénc* model. This means that a particular vernacular model of grid design developed in this region quite independently of external "influences." The autochtonous Senegambian urban model consisted of a central public square (the *pénc*), with the royal palace or the sheikh's compound located to its west, surrounded by a gridded street system. The *pénc* of royal capitals was dominated by monumental trees, while that of clerical towns housed the great mosque and was aligned to the *qiblah* to Mecca, which set the direction of the overall urban grid. The grid-and-*pénc* model had no particular religious significance; it was rather a marker of authority, whether secular or religious. In the royal capitals the grid plan was associated with the aristocratic regime and its accompanying rituals, while in the clerical towns this plan represented religious devotion and an Islamic orthodox life lived along the "Straight Path."

The endogenous grid-and-*pénc* model continued to be employed in settlement planning by the dominant Sufi orders of the region, which expanded massively during the first decades of colonial rule. The modern Sufi leadership continued to develop the "ancestral" Senegambian grid plan design for their settlements and implemented it on the ground in a systematic way. Through this process, the Straight Path of Islam was no longer the preserve of a marginalized clerical elite, but rather it became identified with the social, spiritual and educational project of Sufi mass movements. Through this process Quadiri (Figures 2, 3), Tijani, Murid and Layenne settlements, representing the main Sufi movements that operate today in Senegal, embraced the grid plan. In other words, grid planning as a tool of power is well attested in Senegambia, used by autochthonous elites before its implementation by European colonial authorities.

The history of the French urban settlements in Senegal begins relatively early, in the second half of the seventeenth century. It is one of the oldest histories of European city-building in sub-Saharan Africa. The only contemporaneous urbanization efforts were those of the Portuguese in Angola and of the Dutch settlement of Cape Town (1652). Most other European settlements in sub-Saharan Africa date to the unset of formal colonial rule some two hundred years later. Along the decades and according to the changing needs, the grid plan was a tool used by the various French colonial authorities (first mercantilist trading companies, then the colonial administration). For over three centuries, through both informal and then formal colonial regimes, the French created a variety of grid-planned settlements. From the early hesitative street alignments in French trading posts (*comptoirs* and river *escales*), French urbanization policies developed to promote more comprehensive grid plans in *communes* (legally constituted French municipalities, such as Saint Louis, Rufisque, Gorée and Dakar) (Figure 4) and colonial capital cities. The French also employed grids to lay out the misnamed *villages de liberté* (prison camps for liberated slaves), all the while mass-producing gridded railway market

towns (rail *escales*) for the export of cash-crop peanut production (Thiès, Rufisque, Kaolack, Tivaouane).

Figure 1. (top): Current plan of Lambaye, historic capital of the Kingdom of Baol (drawn by E. Ross based on Google Earth satellite image); **2.** (lower left): Current plan of the Qadiriyya-Kuntiyya shrine-town of Ndiassane (drawn by E. Ross based on Google Earth satellite image); **3.** (lower right): Freshly laid paving stones surface street in center of Ndiassane (photo by E. Ross, 2018)

As the more successful colonial cities began experiencing sustained economic growth and demographic expansion, colonial authorities found themselves obliged, for the first time, to plan for the housing of their "native" inhabitants. Entire new neighborhoods, often with basic grid plans, were laid out somewhere beyond the "green belt" for this purpose. Established mostly between the 1910s and the 1930s in the French (and other European nations') territories in West Africa, the Médina quarter in Dakar constitutes such example. As with the *villages de liberté* and the planning of "green belts", the main rationales in the planning of new neighborhoods designated exclusively for Africans was to facilitate population surveillance, sanitary and tax control. In spite of the strong political, economic and cultural rationales for employing urban grid plans, even at the height of the colonial era (roughly 1880s to 1940), colonial agency over Senegal's territory was not absolute. This type of spatial segregation brings to the fore an internal contradiction in the colonial condition; colonialism created dynamic ethnically heterogeneous societies and at the same time strove to control them by maintaining the fiction of essentialized, fixed, homogenous subject groups through coercive land-use and economic policies, an almost impossible task. Therefore, in a variety of both active and passive ways, African agents also contributed to designing colonial-era urban spaces, turning to their advantage the very tools of colonial domination and creating hybrid spatialities. The entanglements of the different colonial-era agents of urbanization will be touched upon in our lecture, transcending a dichotomous endogenous-exogenous understanding of Senegal's history of grid planning.

Figure 4. Satellite views of three gridded neighborhoods designed by the French colonial authorities: Dakar's Plateau (1) and Médina quarters (2), and Saint Louis' North ward (3) – all at the same scale (Google Earth images)

During the era of formal colonization, and particularly since independence, the two grid-planning cultures, indigenous and European, have become intimately entangled. We explore this entanglement by tracing how the two spatial practices became formalistically and creatively hybridized in several prominent Senegalese cities. In Touba, for instance, a city that symbolizes cultural resistance to colonialism, the implementation of common post-war Western design models of mass residential allotments following Senegal's independence has all but engulfed the indigenous grid-and-*pénc* model so characteristic of the colonial-era Sufi urbanization. In fact, the agency of the State (first colonial, then sovereign) and of the Sufi religious orders has transformed certain neighborhoods in Senegal's "hybrid" cities – cities like Tivaouane, Kaolack and Diourbel (Figure 5) which serve to anchor both the civil administration of the State and the religious activities of the Sufi orders. This points on contemporary crisscrossing between grid plan legacies and their close entanglement, turning the question of the genealogy of Senegal's grid planning into irrelevant.

Another example in this context takes place in downtown Dakar - the showpiece of French colonial planning in West Africa (Bigon, 2016). There, a network of indigenous Lebou *pénc*s has resisted all attempts at erasure and has persisted, including its toponymy

(Bigon, 2008), thriving within the imposed colonial grid system. This case is fascinating as most of the literature on the Lebou tends to concentrate on their suburban settlements in metropolitan Dakar, where land regulations are more lax and enable relative freedom of spatial expression in comparison to the city center (Sylla, 1992; Dumez and Kâ, 2000). Relationship between the French and the Lebou planning cultures changed its character during a relatively long period. In conformity with the colonial situation, the encounter between the two spatial logics was not always a positive or harmonious one, and vernacular settlements were often subjected to attempts at erasure and marginalization by the colonizing power. Yet the Lebou community was far from being a passive recipient of the grid plan and its accompanying attempts at regularization and surveillance; it had its own crystallized and stubbornly persistent spatial practices of settlement configuration. These practices are clearly noticeable in post-colonial Dakar and, quite unexpectedly, in its Westernized city center (Figures 6, 7). The Lebou practices of settlement configuration have not therefore been placed 'side by side' with the French colonial gridded quarters in downtown Dakar e as one might expect from the literature on the 'dual' colonial city e but rather in dynamic involvement with them. It has been demonstrated that since the colonial encounter, grid-*pénc* relational interactions became intimately entangled and hybridised, and eventually changed their character from challenge and competition to adaptation and cohabitation.
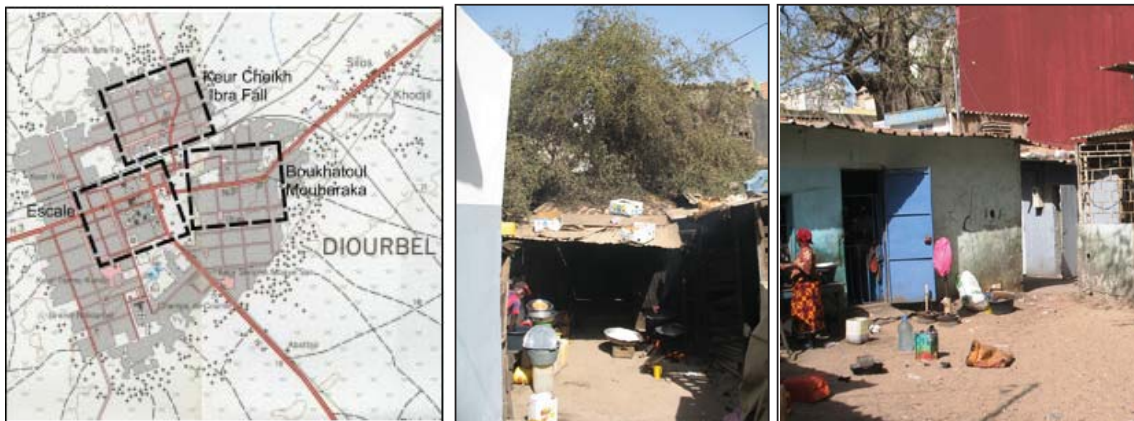
Figure 5. (left): Map of Diourbel showing the three gridded neighborhoods laid out in the early 20th century beyond the European escale (drawing by E. Ross); **6.** (middle): Downtown Dakar, Lebou premises, Thieudéme's family compound; **7.** (right): Downtown Dakar, the sandy courtyard of pénc Mbott overshadowed by the great tree (photos by L. Bigon, 2018)

Methodological remark

Data on Senegal's historic and contemporary urban design and planning practices were obtained from archival sources in France and Senegal, official planning documents, satellite imagery and direct observation in the field. As to an analysis of satellite imagery, we have taken advantage of the free data of Google Earth in order to map both historic and current settlements across Senegal. Google Earth's continuous updating of satellite images of Senegal since 2003 makes it possible to do time-series analysis of places, monitoring how they have changed over the past few decades (this proved particularly important to our discussion of transformations of urban fabrics, particularly in Tivaouane and Kaolack). As to fieldwork, a joint excursion was undertaken by the authors in January 2018 which included the urban settlements of Dakar, Touba, Rufisque, Tienaba, Ndiassane, Thiès, Tivaouane, Diourbel, Fatick, Foundiougne, and Kaolack. Our observations in the field aimed to determine how the urban morphology is *lived*, how the streets, public squares, and housing allotments function together to create local community life. On-site observation proved particularly crucial for the Lebou *péncs*, as these are tiny urban places where the buildings, open spaces, mosques and urban trees are so tightly enmeshed in Dakar's built fabric that the essentials of the morphology

cannot be readily determined from even high-resolution satellite images.

Much of the analysis presented in this study derives from cartographic representations of urban morphology. We follow Larkham in defining urban morphology as a "conceptualization of the complexity of physical form. Understanding the physical complexities of various scales, from individual buildings, plots, street blocks and the street patterns that make up the structure of towns helps us to understand the ways in which towns have grown and developed" (Larkham, 2005, p. 23). We focus mostly on the *design* of urban places, which derives largely from the street pattern (in our case the grid) and housing allotments. In addition to streets and housing allotments, our maps of the urban fabric include public places, principally public squares (the *pénc*), mosques and other religious buildings, schools and markets. The public squares and mosques are essential to the functioning of these urban places and to the identity of the communities they house. In the case of the Lebou *péncs* of Dakar, we have also included monumental trees on our maps because of their important religious and social community functions. More even than the mosques, these monumental trees have guided the spatial development of Lebou settlements.

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Transitional form of industrial mixed-use

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Abstract

The re-adaptation, re-use or mix-use of buildings is not a prerogative of these years and has a long and complex history. Indeed, in the past, the dilapidated buildings or the ones no longer suited to their original function have been revisited in terms of spatial, functional and stylistic characters. Speaking of reuse and mix-use includes a reflection about the shape of the city. In particular, the transition from an industrialized city to a post-industrial one brings with it the characteristics of dismission and re-use, passing through practices of urban, social and economic policies. This work presents a research based on studies about mix use of industrial areas inserted into the urban fabric in Tortona district in Milan. This case study, appears as fertile ground for considerations regarding this type of transition, from industrial and worker district to cultural and productive district. The investigation on the simultaneous presence of manufacturing processes and other use of the space (residential, offices, cultural or exhibition places) is necessary to understand if economic changes and urban policies affect the spatial configuration of a part of the city. The on-going research is conducted through the comparison of Tortona maps in different periods and at different scales to highlight change over time and morphological transformations.

Introduction

The complex transition from industrial to the post-industrial city has marked the development or abandonment of large portions of both European and non-European cities. For this reason, architecture has played an essential role in the decision-making processes aimed at designing the city's consolidated fabrics. Industrial areas, thus, after being the symbol of the progress of technology and innovation, underwent a sharp decline starting from the 70s of the twentieth century. Yet they remain located in the now compact and consolidated fabrics of the cities, in the collective memory of one arrested and stunted growth. As a consequence, some strengths of these areas of the city emerge. For example, their location, close to the main road arteries and waterways, and close to the ancient urban fabric remain characteristics that make them a key and strategic point of urban construction. The industrial areas of the late nineteenth and early twentieth centuries are comparable to seams that connect the fabric of the historic city and that of the "new expansion". Furthermore, these areas could be considered as large brownfields as places equipped not only with their transformative capacity but also as capable of absorbing surrounding urban changes (Barosio, 2009). However, if from the eighties to the beginning of the new millennium, the abandoned industrial areas were considered places full of potential (but still abandoned), it is now possible to glimpse some outcomes of complex operations in these places. In this sense, Edward Glaeser suggests some possible solution analyzing the Detroit case. Detroit, which was the most entrepreneurial place on the planet in 1980, got stuck in the right of a single industry dominated by a big three-set of firms. Cities face the risk of becoming an industrial monoculture. Promote diversity, mixité, and entrepreneurship is better than increase the value of a few big industries and monoculture. Another effective response to problems of disuse could be a temporary use of the space, especially when it manages to field the various components that characterize it (limited costs, reversibility, mobilization from below). Therefore, how can they become part of a long-term project starting from the uses? It allows for experimenting. Even if temporary reuse is generally reversible in its physical transformations, it is rarely so in the uses and traces it leaves, making it necessary and appropriate to rethink the relationship between short-term temporary use and long-term urban transformation (Bruzzese, 2013). This paper is the result of research started with the third level training course Hybrid factory / Hybrid city, held at the Polytechnic of Turin by Prof. Nina Rappaport. It is the product of studies carried out within the Transitional Morphologies Research Unit. The chosen case study, Milan, was the result of reasoning on the Italian that registers the highest per capita GDP, it is a city that intentionally created growth scenarios for its territory through planning tools. This work is composed of three parts: three reference scales are identified (city, neighborhood, and block) through which analyze the context and apply coherent urban morphology reading tools.

The city - the shape of industrial land-use in Milan

The definition of Milan given by Angelo Torricelli, in the book edited by Giovanni Comi, is preparatory for global reasoning on the character of the city. Torricelli said that Milan has always been a city of contained measures but with extensive territorial relationships. Milan is historically rooted in a system of itineraries that is reflected in the coexistence of the different scales at which urban projects and facts are created that evoke large spaces (Comi, 2017). Milan is where the original port character remains legible. Therefore, it is a city based on the dynamics of scale and space changes, a place of experimentation, production, and regeneration. Furthermore, the Italian economic capital, the avant-garde city, the icon of made-in-Italy (especially in the field of fashion and design), hides the signs of a season now complete - abandoned areas, masterpieces of industrial archeology. To read the traces of these processes in the compact urban fabric, also trying to understand what is happening in the city of nowaday, an attempt should be made to reconstruct the historical evolution of the divestment process. Indeed, the analysis of the planning tools is useful to define the urban structure of Milan, the construction of industrial settlements, and the morphological change dictated by the policies of the local government (fig. 1). Since the end of the 19th century, Milan faced a development problem and delineated new and precise guidelines for urban planning. The expansion plan prepared by Beruto in 1884 expressed the intention of organic

urban development through expropriations for public utility and creations of new streets and squares. The main problems to be addressed concerned the interests of industrial development and traffic throughout the city. Beruto drew up a second version of the Plan, which focused on the Piazza del Duomo as the hearth of the city. He proposed the demolition of the bastion, turning them into an urban flowing line, and the placement of public buildings randomly. Thus, since the Plan suggested just an undifferentiated development without precise planning, it severely compromised the layout of the city and its relations with the surrounding area under the pressure of building speculation with the construction of a railway line that enclosed the whole city. The Plan turned out to be insufficient for the development of a large industrial city of the twentieth century. For this reason, the Municipality decided to formulate a new plan (Campos Venuti, 1986). In the first decade of the twentieth century, the population had already considerably increased, and the urbanized area of the city doubled since the first Plan. The manufacturing sector was on the rise, but the Municipality was unable to manage the lack of services present in the expansion areas of the city. The industries were mainly located beyond the bastions, along the railway belt, but in an absolutely chaotic manner. In this confused fabric, the Municipality realized a few squares and some three-lined avenues that connected the boundary of the historic city to the external territories. Starting from the 20s, the Municipality began to outline the possibility of increasing the area of expansion of the city, moving from a monocentric development to a polycentric development with the creation of suburban cores to which communication services and networks were annexed. The proposal for the General Master Plan of expansion (made by Albertini) was to guarantee a targeted development by creating a series of the central radial axis, using the old provincial roads. The new expansion plan tried to solve complex traffic and roadway problems in the suburban area, as well as to improve the conditions of the center, which was not susceptible to too radical reforms. Railway communications were also part of the Plan. Milan had three main stations for travelers and five freight stations. The expansion plan also provided the trace of the future waterways that flowed to the southern, eastern, and northern boundaries of the municipal area. The type of approach aimed at developing the communication routes between the center and the periphery, as well as between the city and the rest of the territory, was crucial to identify the productive areas. The 1926 Master Plan began to lay the foundations for zoning, addressing the practical needs of placement of services and sorting of functions, primarily to bring order to the previous chaotic distribution of production and industrial areas. The Plan encouraged a building specialization with the creation of districts for industry and workshops, close railway junctions and energy sources, neighborhoods of worker's housing, in proximity, and connection with working areas. Although the Plan offered the opportunity to create a polycentric development, Albertini kept following the previous concentric expansion concept. Since the bombings during the Second World War severely damaged Milan, in 1945, the National Liberation Committee decided to promote a free competition of ideas for a new PRG, which would address both the issues of reconstruction and development. In this context, emerged a possible resizing of the city and an industrial decentralization with the proposal of satellite quarters for workers. At the same time, the expansion lines towards north/north-east and north-west were maintained, and the tertiary functions were placed in the historic center. Despite the proposals (including that of the modernist group AR that broke the ratio-centric vision of Milan), the competition did not have a winner. In 1948, based on the competition of '45, were designed new guidelines about both reconstruction and planning. This provision was adopted for two central areas and three expansion zones in the north. Several modifications were then made to the Plan, which was implemented in 1953. The General Masterplan of 1953 had introduced and coded the zoning to organize the various areas of the city; it had also specified the industrial sectors to be built in addition to mapping the existing ones. Indeed, the industrial zones were relegated to large peripheral areas, in contrast with the request to integrate these functions into the territory. Extensive public areas were then squandered in favor of private interests. The Plan didn't take into account the industries located around Milan, which often interfered with the expansion of the urban grid. Despite several attempts to modify the Masterplan of '53, including the so-called "shadow variant" (1969), only in 1976, the Municipality approved a new solution for the city. However, in the 1969 variant is possible to identify that industrial

areas are indicated in the meaning of "mixed-use". This type of definition shows the hybrid character of the city fabric related to the expansion just outside the railway belt. In these areas, there are residential buildings and lively commercial streets around the industrial plants. The areas intended for mixed-use (not better specified) are geographically identified in the north and south of the city (fig.1). During the Seventies, the population and workers' growth didn't stop, and at the same time, some social and economic changes happened (Campos Venuti, 1986). The context in which the approved general variant of 1976 fits, sees the reversal of the favorable demographic trend and the economic transformation of the production structure: Milan is no longer a city with a mainly industrial production structure, the driving sector becomes the tertiary sector. The Plan only partially takes into account this ongoing change. If, on the one hand, it limits the forecasts of new industrial settlements, on the other, it reduces even more drastically the forecasts of tertiary development. Regardless of the crisis in the sector, it reconfirms all the industrial destinations envisaged in the previous Plan. From the Eighties in Milan, a phase began for urban planning, which saw the city practically devoid of a real plan as it was affected by the succession of a series of projects, programs, and sector documents not coordinated by an overview. The term *deregulation* can be attributed to this practice involving the provision of the Master Plan for the benefit of other instruments and procedures (Villani, 1977). In these two decades, the progressive removal of heavy manufacturing from the territorial borders of Milan caused the slow decay of some areas (especially close to the railway belt, in the north and south) inserted in the compact urban fabric. From the first decade of the 2000s, the city experienced a profound renewal from an architectural and urban point of view, with the realization of numerous projects that aimed to redevelop entire areas and large districts. Milan started to project its image in Europe and the world, thanks to prestigious international competitions attended by architects. All these projects have modified and redesigned the layout and the outline of the metropolis. This intention led to a radical change in the shape of the city. In 2005 the municipal administration approved the first Territorial Government Plan (PGT), which defines the structure of the entire municipal territory. In March 2019 has been approved the new PGT that includes five main objectives to be achieved by 2030: a connected, metropolitan and global city; a city of opportunities, attractiveness, and inclusion; a green, livable and resilient city; a city, 88 neighborhoods to call by name; a city that regenerates. The founding objectives of the new Plan dictate the direction of the urban development of the city. They are aimed at overcoming the physical, social, and economic distances between the city center and the suburbs. However, the industry has disappeared in this Plan. No forecast within the city limits and not even any factual status.

At the end of this overview of planning tools and the shape of industrial land use, it is possible to recognize three main planning phases of the city of Milan: - *imagination*, the attempt to foresee a form of expansion (monocentric and polycentric); - *experimentation*, the attempt to give a city development rule by dividing it by zones, based on growth data without a coherent relationship with reality and without specific forecasts; - *forecast*, the attempt to give future goals not tied to the shape of the city. The first phase includes the first attempts to plan expansions with a view to economic, productive, and demographic growth. This phase can be considered starting from 1884 with the Beruto plan up to the experimentation of the fascist years immediately before the Second World War. The second phase (almost 50 years after WWII) is focused on the control of a functional city read by parts. The third phase recognizes the highly changeable character of the city, avoiding planning and focusing on creating goals and scenarios. The purpose of the previous analysis on the form of land use aims to understand the functional and legislative (and formal) transition of the industry in the city of Milan. Even if the industrial areas have disappeared from the planning tools of the city of Milan, it is possible to trace manufacturing activities in the urban fabric through a passage of scale.

The neighborhood - Analysis of Tortonas' streets and patterns

The period between 1976 and the end of the Nineties marked a crucial point in the history of industrial decommissioning. This passage was reflected in the urban structure, generating empty spaces and waiting spaces. Indeed, the progressive shift of manufacturing activi-

ties outside the city limits leaves behind a large number of industrial plant artifacts located above all in the north and south of Milan. The study of a piece of these two broad areas is an opportunity to make some considerations on the correlation between industrial decommissioning and urban form. The case study chosen for this research is Tortona, a former working-class district that has undergone a wave of gentrification, now known as one of the milestones of Milanese social events (such as Design Week and Fashion Week). The transition from agricultural to the industrial area took place after the 1860s. With the construction of the railway, the number of industries grew automatically, and consequently, the number of workers. The sense of community was particularly strong. In this context, Via Tortona can be considered as a central axis on which various industries wind; the General Electric and Ansaldo occupy almost all of the way by themselves. With the 70s gradual closure and shift of the companies present in the neighborhood, such as Ansaldo (steel-mill), Riva Calzoni (hydraulic machines), General Electric (electric components) and Nestlé (food), and thanks to the fragmentation of real estate units, the district suffers a period of abandon. However, thanks to the participation in European found call, Municipality starts, in the 90s, the regeneration of the neighborhood. This operation aimed to create a pole of transformation and then of attraction. The competition focused on the block of the former Ansaldo factories. Herewith the maintenance of some manufacturing activities (Laboratories Teatro Alla Scala), the inclusion of diversified activities were planned. The analysis of the neighborhoods' shape starts from the observation of the current morphology and goes back through the consultation of historical maps. The considerations are divided into two parts (roads and built) and were conducted starting from the texts of Fumihiko Maki, *City with a hidden past*, and Pierre Pinon, *Forme et deformation des object architectureaux et urbain*.

Street structure - Located in the first expansion area of the city, Tortona has a regular road scan. The streets form an ordered network of perpendicular intersections. Although there is no diversification in the size of the roads, there is a hierarchy dictated by the commercial importance of Via Tortona, followed by its perpendicular Via Savona. The neighborhood's previous layout dictates this importance. Most of the industries were located between Via Tortona and the Naviglio. Furthermore, the road intersection between Via Tortona and its perpendicular emphasizes the importance of the road, both because the intersection has a widening and because the buildings that face it present particular corner solutions aimed at highlighting the relationship with the road (fig. 2). The only exception to the grid, finally, is made by the presence of Porta Genova Station, in the north-east of the neighborhood.

Built pattern and land use - Today the district preserves its industrial heritage in the formal expression of the old factories, in the shed roofs, and the residential typology of former worker houses. Analyzing the urban fabric of Tortona, it is possible to find two types: the dense tissue in the north-east area and the central part, the open-plan tissue in the southwest area. In the first case, the blocks, mainly characterized by the central courtyard, are made up of residential cells. In the vertical section, however, it is possible to observe the typical differentiation of the ground floors (commercial use) from the upper ones (for residential use). In the open-plan fabric, however, the boundaries of the block are free, and the functions are better differentiated since the built takes into account distances between buildings. In this way, the different types are close but not mixed. However, the change in land use is noteworthy, which led to a switch (albeit minimal) in shape. If, before the processes of moving away from the urban center of the industries, Tortona presented itself as a district rich in productive activities, today, there is a prevalent trend towards commercial use. This condition caused the persistence of the productive characteristics of the former factories and an internal fragmentation of the environments (fig. 3). Besides, some buildings have been remodeled with new interpretations of the industrial typology.

The block - Ansaldo as the core and trigger of transformation

The internal heart of Tortona is the so-called ex-Ansaldo block. As mentioned before, this place is crucial for the regeneration of the district after the divestment of manufacturing activities. The origins of the structure back to 1904: the company Roberto Zust established the first production facilities. Over the years, it passed to multiple properties, expanding. The sheds were connected to the Porta Genova station through tracks. The structure then moved to

Ansaldo in 1966 for the production of locomotives, railway carriages, and tramways. The progressive decommissioning of the plant began in the 70s, in line with the deindustrialization process of the entire area. The impact was drastic: for many years, new activities were not established in the area, leaving the neighborhood in a state of progressive abandonment due also to the lack of work. However, the abandoned industrial spaces represented an opportunity, and if the whole area slowly began to renew itself, thanks to ideas and projects that made it one of the most fertile and creative areas of Milan. In 1989 the Municipality of Milan purchased the disused area of Ansaldo with the restriction of the use of educational services. The first assignment to the Teatro Alla Scala for his workshops took place in 1994. In 1999 the Municipality of Milan launched an international competition for reconversion, won by David Chipperfield. The intervention process has seen the restoration of some buildings and the construction of a new free-form and architecture in the former factory, now the Museum of Cultures (MudEC), designed to address contemporary languages and to welcome testimonials and cultures of the world, to make diversity a strength. Thus it becomes a cultural center that weaves a dialogue with the international communities present in Milan, renewing that sense of community typical of the past.

Space organization - The architecture of the Ansaldo factory was not designed with a global vision, but randomly according to the productions' need. However, the street facade had to represent the company's image and create a separation between the factory and the city. Each pavilion, in which different activities were done, had large spans and shed roofs. The block has a regular shape character on three sides. The fragmentation takes place on Via Savona, where residential and industrial alternate and mix without uniformity. The Chipperfield project solves the architectural tension between the old and new spaces, maintaining a big part of the former factory, thus to preserve the original boundaries of the factory. He works on the existing buildings only on the vertical connection to create an introvert urban scene and not altering the perception of the building.

Mix use that works together - The fragmentation of spaces in ex-Ansaldo allows the identification of different functions that could be grouped into four categories: manufacturing spaces (Laboratori Tetro Alla Scala); exhibition and cultural areas (MUdeC, Base); workspaces (Base co-working, Direzione Centrale Risorse Umane - Comune di Milano); residential spaces (Casa Base, temporary residence). The manufacturing areas of Laboratori Teatro Alla Scala are connected despite the different activities that are made inside them. Distributive elements like stairs, corridors, lifts, bridges link, and separate the pavilions. There is not a real mix use in the "factory," but is present in a traditional division of functions and works in the same work environment. The different services, for example in Base, are located in the same building on different floors. The mixed-use in ex-Ansaldo areas is represented by the common/public space that is created in the structure of small squares and streets that surround the buildings of the former factory. In those spaces, people who work and live in Ansaldo block could meet each other and share skills. The real potential in mix use of ex-Ansaldo is the presence of shared spaces (fig. 4).

Considerations and conclusions

Starting from the assumption that the reuse processes are strongly conditioned by the original characteristics of the areas in question, the case of Tortona in Milan presents the attributes of relative deindustrialization. This phenomenon shows an increase in production with a shift in activity and the maintenance of employment. The inclusion of new functions in old production sites allows the character of the places to be maintained, giving rise to diversified content. Mixed-use promotes a functional, not radical, reform, preventing the formation of urban voids. The former industrial spaces, therefore, become a seam of the fabric and act as a link for experimenting with different functions in common places. Although manufacturing is not mentioned in urban planning tools, it is still present in the urban fabric not as an empty one but as a formal explanation. The industrial typology is incorporated without mimesis into the urban structure without creating barriers.
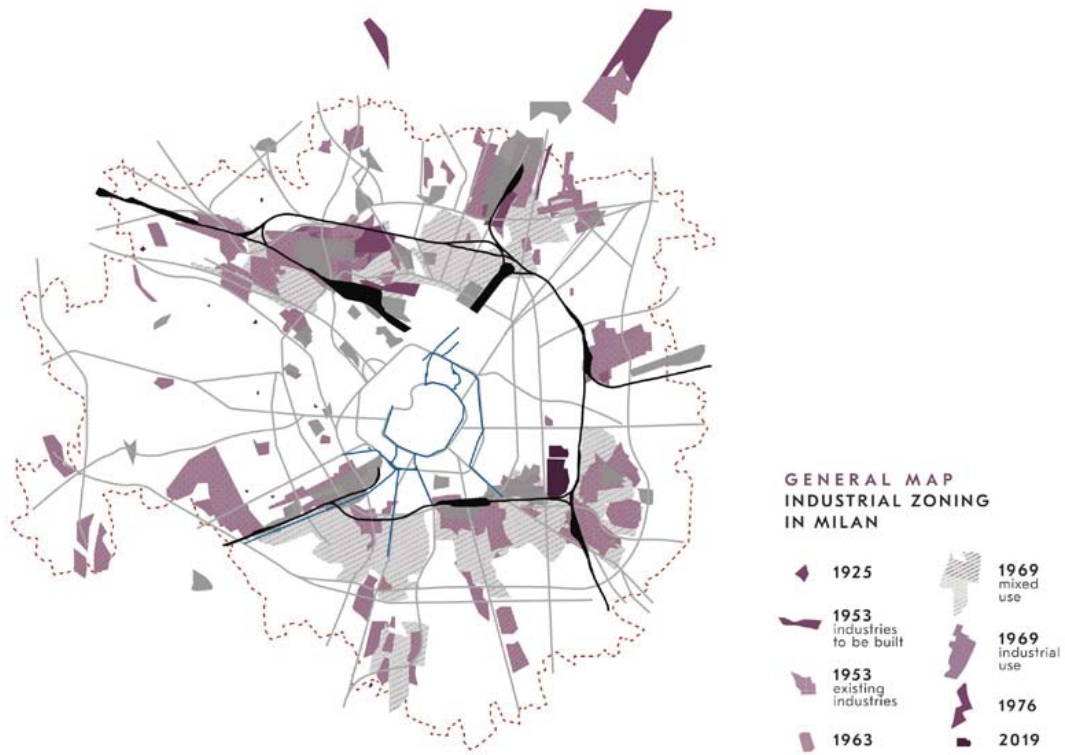
Figure 1. General Map of industrial zoning in Milan.

Figure 2. Street pattern in Tortona.

Figure 3. Built pattern in Tortona today.
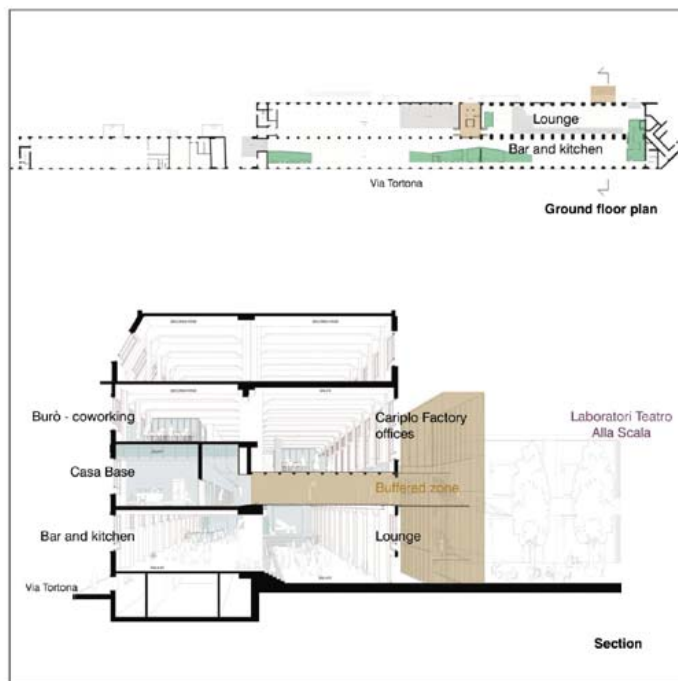
Figure 4. Mixed-use in ex-Ansaldo.

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Urbanscape as Landscape Emanation of East Adriatic Coast

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Abstract

Research is encouraged by twenty-five centuries of uninterrupted urban culture on Eastern Adriatic, a landscape of indented coast, thousand islands and mighty mountains. Urbanity emerged from the landscape - transforming the same landscape into urbanscape. The concept of urbanscape emanation is recognized in the effect that landscape has on urban development as a carrier of urban continuity. The landscape is therefore identified not only as a substrata of the city but as an active participant in urban development and continuity.

In contemporary urban and spatial planning of East Adriatic Coast, the landscape is regarded as an urban context, as setting, and not as an active factor of urban identity, morphology, development, and regeneration. Research objectives are to critically assess the phenomenon of the landscape as a carrier of urban continuity, identity, scope and form, and to set the basic categorization of urbanscape morphology transformations in East Adriatic Coast cities.

The research approach is based on case study comparison and on the Heritage Urbanism approach, comprising of three main components: factors, criteria and models. Case studies are cities of Eastern Adriatic Coast developed between the strong natural landscape of seascape and mountainscape. Those are cities of significant urbanization and development of tourism since the 1950s, which has transformed the coastal landscape of East Adriatic. Case study comparison regards urbanscape morphology through analysis of orthophoto from the 1960s and 2010s (landscape reality), and historic illustrations and contemporary photographs (landscape representation).

The aim of the research is setting types and models of urbanscape morphology transformations that establish urbanscape as landscape emanation of East Adriatic Coast.

Introduction

Landscape as a carrier of urban continuity, identity, scope and form

Research is encouraged by twenty-five centuries of uninterrupted urban culture on Eastern Adriatic, a landscape of indented coast, thousand islands and mighty mountains. Urbanity emerged from the landscape (Bojanić Obad Šćitaroci, 2018) - transforming the same landscape into urbanscape. The concept of urbanscape emanation is recognized in the effect that landscape has on urban development as a factor of urban continuity. The landscape is therefore identified not only as a substratum of the city but as an active participant in urban development and continuity, as a palimpsest of urban development (Khirfan, 2010; Vâlceanu et al. 2014) where the whole city is understood as landscape (Stiles et al. 2014). Research on landscape morphology is regarded as research of form and spatial structure of landscape which carries urban continuity and transformation of natural landscape forms. Material formation of the landscape shaping and reshaping in which social structure, cultural world, and landscape meanings are enfolded (Mayhew, 2009; Sauer, 1963).

In contemporary urban and spatial planning of East Adriatic Coast, the landscape is regarded as an urban context, as setting, and not as an active factor of urban identity, morphology, development, and regeneration. Research objectives are to critically assess the phenomenon of the landscape as a carrier of urban continuity, identity, scope and form, and to set the basic categorization of urbanscape morphology transformations in cities of East Adriatic Coast.

The scope of urbanscape emanation and the theoretical framework of urbanscape morphology transformations are based on the concept of three natures by Cicero (45BC). The first nature is represented in the pristine natural landscape, the second nature in the transformed cultural landscape, and the third nature in designed and created landscape.

Ther research premise is that spatial structures of three natures that remain constant in the process of urbanisation and landscape evolution are considered as carriers of urbanscape continuity, identity, scope, and form. The research of urbanscape morphology transformations is focused on what remains constant. From the urban and spatial planning point of view, these carriers of urbanscape continuity, identity, and form have to be preserved as the establishment of urbanscape emanation.

The research approach is based on case study comparison and the Heritage Urbanism approach (Obad Šćitaroci and Bojanić Obad Šćitaroci, 2019), comprising of three main components: factors, criteria, and models. Case studies are cities of Eastern Adriatic Coast developed between the intense natural landscape of seascape and mountainscape. Those are cities of significant urbanization and development of tourism since the 1950s, which has transformed the coastal landscape of East Adriatic (Sopina and Bojanić Obad Šćitaroci, 2019). Case study comparison regards urbanscape morphology transformation through two levels of landscape research: landscape reality and landscape representation (Antrop, 2013; Antrop and Van Eetvelde, 2017; Girot, 2016). Physical, material, objective and geographical reality of landscape (Mumford, 1961; Rossi, 1982) is analysed through a comparison of orthophoto from the 1960s and 2010s. Landscape representation as a cognitive category (Sarapik, 2002), experience and perception (Lynch, 1960; Cullen, 1961; Taylor, 2008, 2015) is analysed through a comparison of historic illustrations and contemporary photographs.

The aim of the research is setting types and models of urbanscape morphology transformations that establish urbanscape as landscape emanation of East Adriatic Coast.

Research approach

Study of urbanscape morphology transformation through Heritage Urbanism approach on case study comparison

Urbanscape covers contemporary urbanised landscape (both built and unbuilt areas, transformed and designed nature) with the historical and contemporary cultural space of its inhabitants (Sopina and Bojanić Obad Šćitaroci, 2019). The concept of urbanscape is based on the UNESCO (2011) definition of the historic urban landscape. The historic

urban landscape is defined as an urban area understood as the result of a historic layering of cultural and natural values and attributes, extending beyond the notion of historic center or ensemble to include the broader urban context and its geographical setting.

Urbanscape, cultural landscape and natural landscape are intertwined and inseparable. Urbanscape morphology transformations are based on the concept of three natures by Cicero (45BC) which is further elaborated through three natures by Hunt (2000) and UNESCO documents regarding Historic Urban Landscape (UNESCO, 2011) and implementation of the World Heritage Convention (UNESCO, 2017). Three natures of landscape set spatial identity of urbanscape and spatial scope of urbanscape emanation: first primeval nature is found in wilderness and pristine nature of natural landscape; second cultivated nature is found in transformed nature of cultural landscape; third horticultural nature is found in designed nature of created public parks and gardens landscape (Table 1).

Comparison of case studies is based on the Heritage Urbanism approach, comprising of three main components: urbanscape factors, criteria for recognition of urbanscape morphology transformations, criteria for selection of case study, and models of urbanscape morphology transformation.

Factors of urbanscape identity, scope and form are recognised in the elaboration of three natures of the landscape. Factor od urbanscape identity is found in nature types, a factor of urbanscape emanation scope is found in landscape types, and a factor of urbanscape form is found in structures which indicate urbanscape morphological transformations.

Criteria for recognition of urbanscape morphology transformations are set as urbanscape continuity criteria. It is focused on urbanscape reality structures and urbanscape representation structures which remained constant in the process of urbanisation and landscape evolution and which are considered carriers of urbanscape continuity, identity, scope, and form.

Criteria for selection of research spaces define specific landscape setting of individual case study city or settlement:

• cities and settlements situated in the intense natural landscape which sets unique landscape identity and impact urban development

• cities and settlements developed in the topographic setting of strong morphological characteristics which establish and influence landscape and urbanscape morphology

• cities and settlements of the continental coast of the East Adriatic

• cities and settlements situated on the foothills of Dinarides massive.

Models are set as the systematic description of phenomena (reality) and representation (perception) of urbanscape morphology transformations recognised in comparison of case studies regarding carriers of urbanscape continuity, identity, scope, and form.

Conduction of case study comparison

Case studies are explored through the systematic description of carriers regarding urbanscape continuity, identity, scope, and form:

• landscape setting regarding seascape and coastalscape, urbanscape and hinterland mountainscape in which are embodied strong morphological characteristics of topography

• nature types of pristine, transformed, and designed nature which set the spatial identity of case study urbanscape

• landscape type of natural, cultural and urban landscape which sets the spatial scope of urbanscape emanation

• the reality of urbanscape morphology transformation recognised in landscape structures which remained constant through 1960s and 2010s orthophotos of case study spaces

• representation of urbanscape morphology transformation recognised in landscape structures that are identified in historic illustration and contemporary photographs of case study spaces.

A research synthesis of reality and representation of urbanscape morphology transformation is presented through illustrations (Tables 2 to 6).

Case study of Kvarner Bay, city of Rijeka and Rijeka Hinterland

The city of Rijeka is the seat of Primorje - Gorski Kotar County. It is situated at the far North of the Eastern Adriatic Coast where the Kvarner Bay is most deeply indented into the European mainland and on southwest slopes of Rijeka Hinterland. The city area was settled since ancient times because of its strategic position (Dadić et al. 2001) and a deep-water port. Rijeka developed from two historic cities: Rijeka (Italian city) and Sušak (Croatian city) divided by the Rječina river as the historical border. Both ports of Rijeka and Sušak started major development at the beginning of the 18th century, building port and industry infrastructure along the coastline and disabling direct contact of the city and the seacoast.

Urbanscape of Rijeka developed between intense natural landscapes of Kvarner bay seascape and Rijeka Hinterland mountainscape which set unique spatial identity. Different types of landscape can be distinguished: cultural landscape and urbanscape of Adriatic seascape and coastalscape; cultural landscape and urbanscape of Rijeka; and natural and cultural landscape of Rijeka Hinterland mountainscape.

Landscape transformations are embodied in different types of natures which set the spatial scope of Rijeka urbanscape emanation. The pristine nature of the Rijeka Hinterland mountainscape is the origin of Rijeka urbanscape. Transformed nature is represented in parts of the Rijeka Hinterland mountainscape and coastalscape of Kvarner Bay that are easily accessible and convenient for development. The evolution of Rijeka urbanscape is embodied in the transformed nature of coast and mountain. Designed nature is recognised in planned urban structures, open public places, and parks of the urbanscape. Zenith of Rijeka urbanscape is represented in a designed nature.

Landscape reality as a factor of Rijeka urban identity, form and continuity is found in landscape structures that remained constant in the process of urban development and landscape change from 1960s till 2010s (Table 2). Mountainscape of Rijeka Hinterland is recognised as a spatial structure of landscape continuity in the pristine natural landscape. Spatial and linear structures of landscape continuity in a transformed cultural landscape are Rječina industrial landscape, Rijeka port, and industrial seafront. Rijeka urban core, Trsat fort and sanctuary, and Sušak settlement are spatial, complex and compact structures recognised as the embodiment of designed landscape continuity.

Landscape representations that carry the identity of Rijeka urbanscape can be found in landscape structures represented by a historic illustration of 13th Century Rijeka and by contemporary photographs (Table 2). Spatial structures of the Rijeka Hinterland mountainscape are recognised as identity carriers of Rijeka pristine natural landscape. Carriers of Rijeka identity in the transformed landscape are recognised in spatial and linear structures of Rječina canyon and origins of Sušak settlement. The urban core of Rijeka and Trsat fort are recognised as designed identity carriers of Rijeka.

Case study of Velebit Chanel, settlement of Starigrad Paklenica and South Velebit mountain

Starigrad Paklenica is a settlement in Zadar County and the seat of Starigrad Paklenica Municipality. It is situated along the Adriatic Sea coast of Subvelebit Channel and on foothills of South Velebit mountain. The settlement developed in proximity to the Velika Paklenica canyon and small cape of Velika Paklenica inflow. The Velika Paklenica canyon has been used since Prehistory as a convenient trade and shepherds route connecting the Adriatic coast with the hinterland highlands of Lika. Hiking trails have taken place of trade and shepherds routes after the abandonment of the traditional semi-nomadic way of life (Bušljeta 2010; Belaj 2004; Faber 1995). Along with the Velika Paklenica inflow is set one of the rare plains suitable for agriculture in the harsh karst landscape of South Velebit.

The natural landscape setting of Starigrad Paklenica defines a unique spatial identity and covers seascape and coastalscape of Subvelebit Channel and mountainscape of South Velebit hinterland. Different types of landscape can be distinguished: cultural

landscape and urbanscape of Adriatic seascape and coastalscape; cultural landscape and urbanscape of Starigrad Paklenica; and natural and cultural landscape of South Velebit mountainscape.

Landscape transformations are embodied in different types of natures which set the spatial scope of Starigrad Paklenica urbanscape emanation. Pristine nature covers the harsh karst landscape of South Velebit that is still hard to reach for crowds of people. This pristine nature of South Velebit is the origin of Starigrad Paklenica urbanscape. Transformed nature is represented in parts of the South Velebit mountainscape and coastalscape of Subvelebit Channel that are easily accessible and convenient for development. The evolution of Starigrad Paklenica urbanscape is embodied in the transformed nature of coast and mountain.

Designed nature is recognised in created protourban structures situated in the natural and transformed landscape, and in designed open public places of the urbanscape. Zenith of Starigrad Paklenica urbanscape is represented in a designed nature.

Landscape reality as a factor of Starigrad Paklenica urban identity, form and continuity is found in landscape structures that remained constant in the process of urban development and landscape change from 1960s till 2010s (Table 3). Spatial structures of landscape continuity in pristine natural landscape are protected karst landscape of South Velebit and pine woods in Paklenica National Park. Vales surrounded by dry stone walls, agricultural land, and traditional settlements are spatial, linear and complex structures of landscape continuity recognised in the transformed cultural landscape. Protourban compact structures are recognised as the embodiment of designed landscape continuity.

Landscape representations that carry the identity of Starigrad Paklenica urbanscape can be found in landscape structures represented by a historic illustration of the unknown author and by contemporary photographs (Table 3). Carriers of Starigrad Paklenica identity in pristine natural landscape are recognised in spatial structures of South Velebit karst. Spatial and linear structures of agricultural land and communications are recognised as identity carriers of Starigrad Paklenica transformed landscape. Protourban compact structure of Večka kula (fort) is recognised as the designed identity carrier of Starigrad Paklenica.

Case study of Kaštela Bay, city of Kaštela and Kozjak Mount

The city of Kaštela is an agglomeration of 7 small settlements developed from castel fortresses, which are administratively treated as a single city. Kaštela settlements: Kaštel Štafilić, Kaštel Novi, Kaštel Stari, Kaštel Lukšić, Kaštel Kambelovac, and Kaštel Gomilica, are situated between the Kaštela Bay and slopes of Kozjak mountain, along the fertile Kaštela Field. The location along the fertile field and seacoast suitable for docking was settled since prehistoric times. Historic castel fortresses and adjacent fortified settlements were formed in the late 15th and early 16th century on prominent sea rocks for defense and protection from the Ottomans. With the development of tourism on the Adriatic coast and intense industrialisation from the half of the 20th century, space between traditional castels is built in random interspersion.

Urbanscape of Kaštela developed between intense natural landscapes of Kaštela Bay seascape and Kozjak mountainscape which set unique spatial identity. Different types of a landscape can be distinguished: cultural landscape and urbanscape of Kaštela Bay seascape and coastalscape; cultural landscape and urbanscape of Kaštela; and natural and cultural landscape of Kozjak mountainscape.

Landscape transformations are embodied in different types of natures which set the spatial scope of Kaštela urbanscape emanation. Pristine nature of Kozjak mountainscape and littoral coastalscape are origins of Kaštela urbanscape. Transformed nature is represented in parts of Kozjak mountainscape and Kaštela Bay coastalscape that are easily accessible and convenient for development. The evolution of Kaštela urbanscape is embodied in the transformed nature of coast and mountain. Designed nature is recognised in the urban network of castels, gardens, and parks which represent the zenith of Kaštela urbanscape.

Landscape reality as a factor of Kaštela urban identity, form and continuity is found in landscape structures which remained constant in the process of urban development and landscape change from 1960s till 2010s (Table 4). Slopes and hinterland of Kozjak are recognised as spatial structures of landscape continuity in the pristine natural landscape. Spatial and linear structures of arable land and communication of the Kaštela field are recognised as landscape continuity in the transformed cultural landscape of Kaštela. Historical castels, gardens and public parks are complex and compact structures recognised as the embodiment of designed landscape continuity.

Landscape representations that carry the identity of Kaštela urbanscape can be found in landscape structures represented by a historic illustration of 16th Century Kaštela and by contemporary photographs (Table 4). Spatial structures of Kozjak mountainscape and hinterland are recognised as identity carriers of the Kaštela pristine natural landscape. Carriers of Kaštela identity in the transformed landscape are recognised in spatial, complex and compact structures of Kaštela arable field and network of sacral architecture along Kozjak ridge and Kaštela field. The complex and compact structure of castel network is recognised as the designed identity carrier of the Kaštela.

Case study of Hvar – Brač Chanel, city of Makarska and Biokovo mountain
Makarska is the seat of the City of Makarska in Split-Dalmatia County. It is situated between the Brač-Hvar Channel of the Adriatic Sea and under cliffs of Biokovo mountain. Makarska developed along with the natural port of horseshoe shaped bay enclosed by the Osejava peninsula and St. Peter peninsula. Natural benefits of the protected harbour, littoral slope fields, Biokovo cliffs as defence and mountain hinterland suited for livestock breeding were recognised from prehistory (Tomasović 2002, 2009; Vidović, 2012).

The natural landscape setting of Makarska defines a unique spatial identity and covers seascape and coastalscape of Brač-Hvar Channel and mountainscape of Biokovo. Different types of landscape can be distinguished: Adriatic seascape and coastalscape with cultural landscape and urbanscape; Makarska with cultural landscape and urbanscape; and Biokovo mountainscape with the natural and cultural landscape.

Landscape transformations are embodied in different types of natures which set the spatial scope of Makarska urbanscape emanation. Pristine nature covers the harsh karst landscape and cliffs of Biokovo, which is the origin of Makarska urbanscape. Transformed nature is represented in parts of the Biokovo mountainscape and Adriatic coastalscape that are easily accessible and convenient for development. The evolution of Makarska urbanscape is embodied in the transformed nature of coast and mountain. Designed nature is recognised in planned urban structures, created open public places and parks, which present zenith of Makarska urbanscape.

Landscape reality as a factor of Makarska urban identity, form and continuity is found in landscape structures which remained constant in the process of urban development and landscape change from 1960s till 2010s (Table 5). Spatial structures of landscape continuity in pristine natural landscape are protected karst landscape of Biokovo Nature Park. Park woods of the Osejava and St. Peter peninsulas and traditional settlements are spatial and complex structures of landscape continuity recognised in the transformed cultural landscape. Makarska urban core, port and seafront are spatial and linear structures recognised as the embodiment of designed landscape continuity.

Landscape representations that carry the identity of Makarska urbanscape can be found in landscape structures represented by historic illustration and by contemporary photographs (Table 5). Carriers of Makarska identity in pristine natural landscape are recognised in spatial structures of Biokovo cliffs. Spatial and linear structures of the agricultural land of Makarska field, bay, and port of Makarska, Osejava, and St. Peter peninsulas are recognised as identity carriers of Makarska transformed the cultural landscape. Thes patial structure of urban core is recognised as the designed identity carrier of Makarska designed urbanscape.

Case study of open Adriatic sea, city of Dubrovnik and Srđ highlands
The city of Dubrovnik is the seat of Dubrovnik - Neretva County. It is situated on the south of the Eastern Adriatic Coast where a stretch of Adriatic islands end and the open sea begins.

The origins of the city are linked to the Antique town of Epidaurum (modern day Cavtat) and settling under the foothills of Srđ highlands, on a small peninsula with natural sea cliffs and natural clove. The strategic position of the city enabled the development of maritime trade, the exchange of culture and retaining liberty as the capital of the Republic of Ragusa (1358-1808). Dubrovnik is best known for Old City urban matrix, walls, and fortresses which were declared UNESCO World Heritage site in 1979.

Urbanscape of Dubrovnik developed between intense natural landscapes of open Adriatic sea and Srđ mountainscape which set unique spatial identity. Different types of landscape can be distinguished: cultural landscape and urbanscape of Adriatic seascape and coastalscape; cultural landscape and urbanscape of Dubrovnik; and natural and cultural landscape of Srđ mountainscape.

Landscape transformations are embodied in different types of natures which set the spatial scope of Dubrovnik urbanscape emanation: pristine nature found in Srđ mountainscape and Petka coastalscape, transformed nature found in coastalscape, urbanscape and mountainscape of Dubrovnik, and designed nature found in Dubrovnik urbanscape. The origin of Dubrovnik urbancape is found in a specific landscape setting where coastalscape and mountainscape meet. The evolution of Dubrovnik urbanscape is embodied in the transformed landscape of coast and mountain, while zenith is represented in the designed landscape.

Landscape reality as a factor of Dubrovnik urban identity, form and continuity is found in landscape structures that remained constant in the process of urban development and landscape change from 1960s till 2010s (Table 6). Slopes of Srđ mountainscape and Petka woods are recognised as spatial structures of landscape continuity in the pristine natural landscape. Spatial and complex structures of landscape continuity in the transformed cultural landscape are suburbs of Dubrovnik Old City and traditional settlements along the seacoast and in mountainscape. The Old City and network of villas with gardens are spatial, complex and compact structures recognised as the embodiment of designed landscape continuity.

Landscape representations that carry the identity of Dubrovnik urbanscape can be found in landscape structures represented by Giovanni Battista Fabri historic illustration of 17th Century Dubrovnik and by contemporary photographs (Table 6). Spatial structures of Srđ hinterland are recognised as identity carriers of Dubrovnik pristine natural landscape. Carriers of Dubrovnik identity in the transformed landscape are recognised in spatial, complex and compact structures of the defensive network of the Srđ, Old City suburbs and settlements of Mokošica Bay. Urban matrix, walls ,and forts of the Old City are recognised as designed identity carriers of Dubrovnik.

Conclusion
Synthesis of research results

Results and contributions of the conducted research are established in systematisation of the landscape as a carrier of urban continuity, identity, scope and form through the concept of three natures, and in setting basic categorisation of urbanscape morphological transformations based on factors, criteria, and models (Table 7).

Three natures of urbanscape emanation are recognised in landscape settings which define unique identity of East Adriatic Coast cases – in seascape with coastalscape, urbanscape, and mountainscape. Landscape setting embodies the topography of strong morphological characteristics that acts as a constant in process of urban development and landscape change.

The factor of urbanscape identity is recognised in nature types covering pristine, transformed and designed nature. The factor of urbanscape emanation scope is recognised in landscape types covering the natural, cultural and urban landscape. The factor of urbanscape form is recognised in structural types of urbanscape morphological transformations covering spatial, linear, complex and compact structures.

Criteria for recognition of urbanscape morphology transformations are set as urbanscape continuity criteria covering urbanscape reality and representation structures that remain constant in the process of urbanisation and landscape evolution. Continuity crite-

ria applied in the spatial planning process reveals urbanscape emanation structures that need to be preserved as carriers of urbanscape continuity, identity, scope, and form. Criteria for selection of case studies indicate spaces of specific landscape settings where the intense natural landscape of seascape and mountainscape sets unique urbanscape identity.

Phenomenon (reality) and representation (perception) models of urbanscape morphology transformations set levels of urbanscape emanation: emergent of urbanscape from the first nature of the pristine natural landscape, evolvement through second nature of transformed cultural landscape and development through third nature of designed urbanscape. Phenomenon models cover the pristine nature of natural landscape, transformed nature of the cultural landscape and designed nature of the created urbanscape. Representation models cover urbanscape origin, evolution, and zenith.

By systematisation of the landscape as a carrier of urban continuity, identity, scope, and form through the concept of three natures and by setting types and models of urbanscape morphology transformations from the urban and spatial planning point of view, urbanscape is established as landscape emanation of the East Adriatic Coast.

Cicero, 45BC Three natures	First nature (wilderness)	Second nature (landscape of agriculture)	Third nature (the landscaping of gardens)
Hunt, 2000 Three natures	First nature (wilderness)	Second nature (man-made countryside and town)	Third nature (gardens)
UNESCO, 2011, 2017 Historical urban landscape and cultural landscape	Associative landscape	Organically evolved landscape	Landscape designed and created intentionally by man
NATURE TYPES AS SPATIAL IDENTITY OF URBANSCAPE	PRISTINE NATURE	TRANSFORMED NATURE	DESIGNED NATURE
LANDSCAPE TYPES AS SPATIAL SCOPE OF URBANSCAPE EMANATION	NATURAL LANDSCAPE	CULTURAL LANDSCAPE	URBANSCAPE

Table 1. Three natures as spatial identity of urbanscape and spatial scope of urbanscape emanation.

Case study of Kvarner Bay, city of Rijeka and Rijeka Hinterland
Synthesis examples of reality and representation of urbanscape morphology transformation
Pristine nature of natural landscape
Rijeka Hinterland
Transformed nature of cultural landscape
Rijeka industrial and port landscape
Designed nature of created urbanscape
Rijeka urban core

Table 2. Synthesis example of reality and representation of urbanscape morphology transformation in Rijeka urbanscape.

Case study of Velebit Chanel, settlement of Starigrad Paklenica and South Velebit mountain
Synthesis example of reality and representation of urbanscape morphology transformation
Pristine nature of natural landscape
Karst landscape of South Velebit
Transformed nature of cultural landscape
Vales surrounded by dry stone walls
Designed nature of created urbanscape
Protourban compact structures (Večka kula - fort)

Table **3.** Synthesis example of reality and representation of urbanscape morphology transformation in Starigrad Paklenica urbanscape.
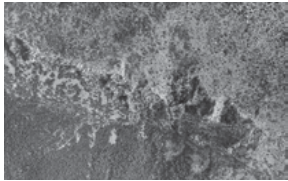
Case study of Kaštela Bay, city of Kaštela and Kozjak Mount
Synthesis example of reality and representation of urbanscape morphology transformation
Pristine nature of natural landscape
Kozjak mount and hinterland
Transformed nature of cultural landscape
Arable land of Kaštela field
Designed nature of created urbanscape
Castels

Table 4. Synthesis example of reality and representation of urbanscape morphology transformation in Kaštela urbanscape.
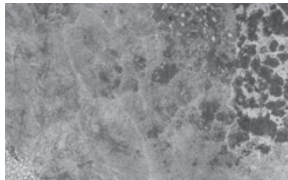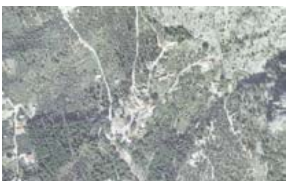
Case study of Hvar – Brač Chanel, city of Makarska and Biokovo mountain
Synthesis example of reality and representation of urbanscape morphology transformation
Pristine nature of natural landscape
Biokovo cliffs and hinterland
Transformed nature of cultural landscape
Network of traditional settlements
Designed nature of created urbanscape
Makarska urban core

Table 5. Synthesis example of reality and representation of urbanscape morphology transformation in Makarska urbanscape.

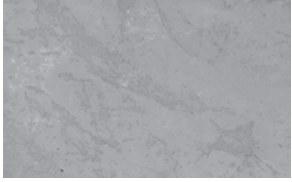| Case study of open Adriatic sea, city of Dubrovnik and Srđ highlands		
Synthesis example of reality and representation of urbanscape morphology transformation		
Pristine nature of natural landscape		
Slopes of the Srđ hill		
Transformed nature of cultural landscape		
Network of traditional settlements		
Designed nature of created urbanscape		
Old City		
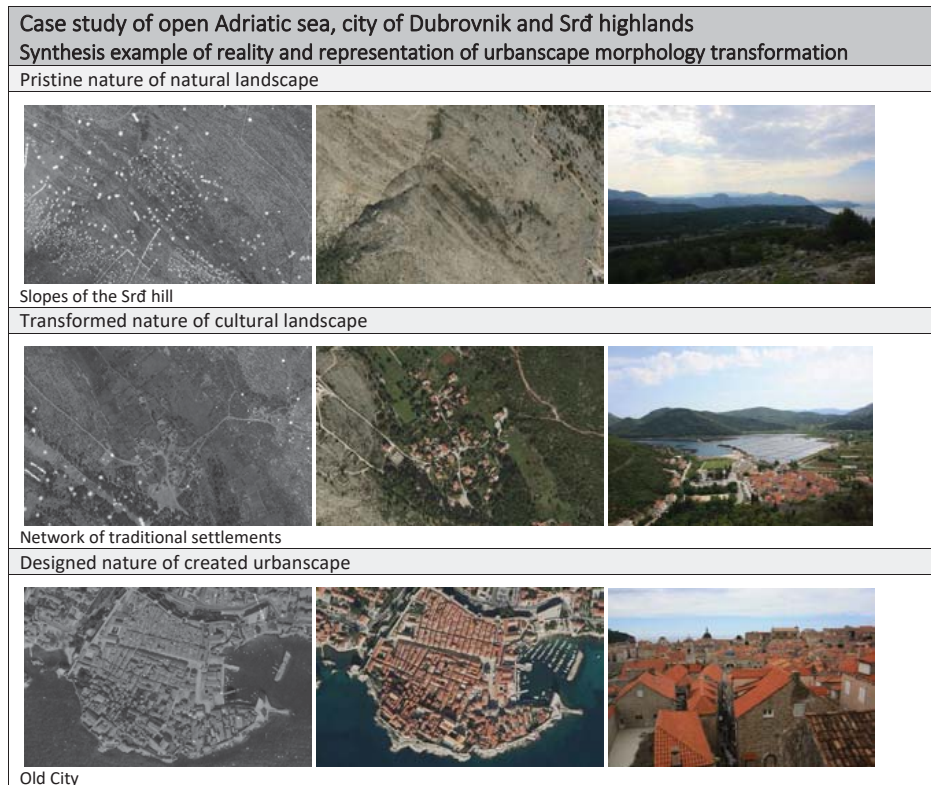
Table 6. Synthesis example of reality and representation of urbanscape morphology transformation in Dubrovnik urbanscape.

Cicero, 45BC: Three natures	First nature (wilderness)	Second nature (landscape of agriculture)	Third nature (the landscaping of gardens)
Recognition in landscape setting	Mountainscape Seascape	Mountainscape Seascape / Coastalscape Urbanscape	Coastalscape Urbanscape
NATURE TYPES AS SPATIAL IDENTITY OF URBANSCAPE	PRISTINE NATURE	TRANSFORMED NATURE	DESIGNED NATURE
LANDSCAPE TYPES AS SPATIAL SCOPE OF URBANSCAPE EMANATION	NATURAL LANDSCAPE	CULTURAL LANDSCAPE	URBANSCAPE
PHENOMENON MODELS OF URBANSCAPE MORPHOLOGY TRANSFORMATION	PRISTINE NATURE OF NATURAL LANDSCAPE	TRANSFORMED NATURE OF CULTURAL LANDSCAPE	DESIGNED NATURE OF CREATED URBANSCAPE
REPRESENTATION MODELS OF URBANSCAPE MORPHOLOGY TRANSFORMATIONS	Urbanscape origin	Urbanscape evolution	Urbanscape zenith
STRUCTURE TYPES OF URBANSCAPE MORPHOLOGY TRANSFORMATIONS	SPATIAL STRUCTURES Vasts; Areas		
	LINEAR STRUCTURES Corridors; Fronts		
	COMPLEX STRUCTURES Infrastructure; Network		
	COMPACT STRUCTURES Clusters; Landmarks		

Table 7. Results and contributions.

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The role of Pulp and Paper mills in the Quebec City's urban development: the first observations.

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Abstract

This paper focuses on the morphological characteristics of Pulp and Paper manufacturers' facilities, a major industrial infrastructure of the 20th century in Quebec, in order to understand their geographic context and privileged location within the urban fabric. The site design and building layout show an evolving production thinking. This research therefore opens discussions on the potential for use of paper manufacturers as industrial churches, as well as their limitations, both in their original function and in a possible conversion. Finally, a set of recommendations is issued at multiple scales for the purpose of assisting stakeholders. The analysis will help improve the use and planning of vacant or to-be vacant sites and thus future urban life quality.

In the 20th century, the cityscape and territorial order of numerous cities in the province of Quebec were built upon industrial heritage. In 2001, we counted 62 operating paper manufacturers in Quebec, and only 43 in 2013. Considering Quebec's eminence in the Pulp and Paper industry, change in the worldwide newsprint consumption threatens this form of export and its production. The location of production-specialized building infrastructure is mostly based on transportation needs (ports, railroads, highroads) to ensure supply of raw materials, shipments of manufactured goods, as well as work force presence.

Once peripheral, these sites are now central locations raising urban design matters toward a vision of sustainable cities. What are Quebec paper manufacturers' potentiality to be requalified? Based upon a typo-morphological analysis framework, the key objective is to delineate in various analytical scales the complex inclination of the plant layout and transformation in Quebec. It is based on three key morphological scales — territorial, urban and architectural — ending with both urban and architectural recommendations. Ultimately, how can we understand and address these lead sites?

Context

Considering that 60% of the worldwide population will live in the city by 2030 (United Nations Development Program [UNDP], 2016) new development strategies are implemented to mitigate the urban sprawl (Dumesnil and Ouellet, 2002) which is perceived to be one of the 21st century's major challenge (Benali, 2012; Dreier, Mollenkopf and Swanstorm, 2013). Can we build cities on the current footprint of declining industrial sites?

Quebec's industrialization begins in the early 20th century with the provision of low-cost hydroelectricity meeting the "growth of new industries based on natural resources exploitation" [free translation] (Linteau, 1996, p. 136). Among these new productions, Pulp and Paper mills became a keystone of regional development across Canada, and notably in Quebec.

The industrialisation process was further fuelled by the two World Wars, especially the second one that resulted in an intensive post-war suburban development, which was stamped by the "American way of life" with the "residential sprawl, the waste and scarcity of buildable land, the landscape sprawl, socio-spatial and environmental segregation, uncontrolled increase in individual motorized mobility, etc." (Merzaghi and Wyss, 2009, p. 1).

Over half a century later, many of these Pulp and Paper mills have become vulnerable because of the mixed conditions of new technologies and the changes in the paper consumption, notably the decline of newspapers printing. Their sites and infrastructures, originally located at the fringe of urban areas, found themselves, in many cases, surrounded by an urban development they supported for decades.

In response to this situation, "brownfields, largely and often right in the heart of cities, constitute […] a major development potential" [free translation] (Benali, 2012). According to Dumesnil and Ouellet (2002), "generally speaking, brownfield is a space historically used for industrial purposes, but which is today abandoned and unused. Land may or may not be contaminated, but in reality, it is often contaminated" [free translation] (p.1). As Whitehand and Morton (2004) explain, redeveloping or requalifying a completely or partially abandoned zone can result in great radius of influence:

> "Because of the large size of the fringe-belt plots relative to other types of site, especially house plots, their redevelopment affected a relatively large number of neighbours commonly at least one boundary bordered, or was on the opposite side of the road from, numerous private householders" (Whitehand and Morton, 2004, p. 287).

A Pulp and Paper Mill, as an industrial heritage, consists primarily of production-specialized buildings. "By special building, we mean all these buildings which stand out in the built environment and constitute the "emergence" […] The specialized building is emerging – both from the point of view of its quality and its dimensions [free translation] (Maffei and Maffei, 2008, p. 15). As opposed to the spontaneous construction of the core urban fabric, these industrial areas, often referred to as brownfields, are developed under a set line of thoughts and principles.

Problematic and Relevance

Brownfields are critical concerns in today's context: once peripheral, the sites are now mostly located in central areas (Benali, 2012). Considering their historical layouts, brownfields have become an issue as the industry evolved. The literature argues that requalifying brownfields is currently a wiser planning option. Numerous recommendations focus on social and economic issues (Dumesnil and Ouellet, 2002; Theys, 2002); however, very few address the morphological and spatial planning.

The Pulp and Paper industry has remained a major economic sector in Quebec over the last decades (Banville & Ministère de l'Industrie, du Commerce et du Tourisme, 1981). In 2001, 62 mills were active, but only 43 remained in 2013 (Ministère de l'Environnement du Québec, 2001; MDDELCC, 2016) (see figure 1). Quebec's Pulp and Paper industry focused on newsprint production (Hébert and Coulombe, 1998). In 2001, Quebec directed 41% of Canadian and 10% of worldwide newsprint production (Gouvernement du Québec, 2019). Today, with the growth of online media, this production is jeopardised, hence the need to consider how to requalify paper manufacturers sites and building.

The initial research confronted the limited documentation on brownfield redevelopment. The literature stresses a description and identification of brownfields by addressing the three main issues: economic capacity, social impact and soil contamination. The spatial requalification is largely ignored except a few case studies have engaged on such a matter (Benali, 2012).

Search Question and Key Objectives

In other words, what is the requalification potential of Pulp and Paper mills, at different design scales? Based upon a typo-morphological analysis framework composed of territorial, urban and architectural scales, as well as land use and construction issues, the research objective is: to document, at different scales, Pulp and Paper sites and buildings formation and evolution.

a) Identify the structural conditions leading to Pulp and Paper industrial development

b) Describe and analyse the Pulp and Paper spatial location and urban impact as well as the typo-morphological rules guiding their transformation

c) Assess the architectural characteristics of Pulp and Paper mills

d) Set recommendations and action procedures regarding these sites' requalification.

Conceptual framework

Urban Morphology

> *"Urban morphology is the study of the physical form of the city and the progressive constitution of its fabric. It constitutes the analysis and decryption of urban landscapes and makes it possible to understand the diversity of forms encountered in an agglomeration and to show that they are the result of a system of complex relationships" [free translation] (Barré, 2004, p. 695).*

The typo-morphological analysis is primarily a means to assess complex development through multiple scales analysis and design issues. No matter how broad the studied factors are, the analytical tread delineates the object's urban, the typological option, the construction methods and development conditions. The typical framework addresses three scales — territory, urban planning and architecture – and four issues — layout, program, construction and both legal and financial factors (see figure 2).

The morphology is essentially a holistic and systemic approach toward urban areas as an intricate urban complex as well as their built components and lands. It offers an evolving process for an objective interpretation of the built environment.

Fringe Belt

"The fringe-belt concept […] has its origins in the recognition by [Herbet] Louis [in Germany] of the long-term significance of physical limitations on urban growth, notably city walls" (Whitehand, 1988, p. 47). Although the fringe-belt concept has been formulated for over 50 years, the first recognition of the fringe belts is a derivation of a concept obviously studied in Europe: fortifications in historic cities (Whitehand and Morton, 2004). The concept is particularly appropriate as it goes beyond the geographic description and addresses spatial development and sociological expectations (Whitehand, 1988). As one of urban morphology pioneers in England, Whitehand defines his concept in its designation of origin. "Fringe belts form boundary zones between historically and morphologically distinct housing area" (Whitehand, 2001, p. 106). His conception of urban development is closely driven by the historic period of growth:

> *"[Fringe belts] provide practical geographical orientation by providing a sense of position within or on the edge of the city, but at a deeper level of appreciation they provide a historico-geographical frame of reference within which the phases of development, and physical forms, of previous societies are related to the physical configurations of present cities" (Whitehand and Morton, 2004, p. 276).*

That being said, every sprawl period of urban area has his fringe belt. Theoretically, "these dynamics, in combination with geographical obstacles to the uninterrupted outward growth of the built-up area, gave rise to an urban area in which residential growth zones alternated with fringe belt" (Whitehand, 2001, p. 105). Applied to the evolution of several cities in Quebec, Whitehand's diagram provides a method to decipher the conditions for growth of peripheral urban fabric. Multiple successive fringe belts therefore offer a concept to comprehend the growth of human settlements on a metropolitan scale.

Methodological approach

The goal of the research is to develop a combined approach, both deductive and inductive (Fortin and Gagnon, 2015), in order to streamline the functional logic generally associated with the urban and architectural characteristics of Pulp and Paper Mills.

This study is part of the action-oriented research paradigm (Creswell, 2014) structured to implement a subject-based logic analysis instead of a traditional rigid protocol method. As Creswell (2014) defines, the case study is the research tradition to prioritize and to provide recommendations on these sites' requalification. The search question is exploratory and relates to "a new situation […] on [which] little data exists" [free translation] (Bourgeois, 2016). With this multiple scale method, the case study is conducted in a funnel logic in accordance with the studied scale.

This research is inspired by the multiscale methodology J.W.R. Whitehand and M.J. Morton apply in accordance with the urban morphology (Whitehand and Morton, 2004). It is based on three key morphological scales — territorial, urban and architectural — ending with both urban and architectural recommendations. The authors built their methodological approach upon two different scales – territorial and urban – in order to understand Birmingham's Edwardian fringe belt.

The first step in the current research, plans, historical and aerial photos, reports, measured drawings, etc., will be analysed as part of a non-proprietary secondary sources assessment, in order to map the studied Pulp and Paper manufacturer morphogenesis and, hence, identify territorial recurrences and singularities for a thorough understanding of the logic behind Quebec Pulp and Paper mills' development (through probabilistic sampling since 62 operating paper manufacturers in 2001 are studied at this point of the research).

Consequently, fifteen to twenty representative cases among all will be analysed for a deeper urban scale research, with the objective of categorising all sites according to their present development conditions as well as identifying their connection with the adjacent built environment. It will be interesting to see if the number of cases is determined before or after the territorial data is all gathered. An odd sample would avoid an absolute median, thus ensuring meaningful results.

On an architectural scale, the sample will be reduced significantly to only fewer representative cases among all Quebec Pulp and Paper mill for consistent and more specific data, in order to assess the buildings' characteristics. This should lead to the delimiting both built and disappeared structures for potential requalification. Finally, recommendations and action procedures regarding these sites' requalification will be suggested as design theoretical considerations. These recommendations will apply to my degree course, both at an urban scale within my urban design final degree project (Projet de fin d'études – PFE) and at an architectural scale within my architecture PFE.

First observations

Multiple scale analysis

The first observations resulting from this research are especially related to the multiple scales of structural permanence for pulp and paper mills implementation (see figure 3). These structural variables define the relationship between the factories and their environment. The structural permanence refers to development to the conditions supporting a Pulp and Paper mill in a territory. At a territorial scale, some variables appear: access to resources such as raw material and water – wood, forests, rivers, waterfalls, streams – and the provision of transportation infrastructure – harbour and railway – directly connected to the territorial export ring.

According to urban scale, sites are usually peripheral to urban development: either close

to an existing neighbourhood or a new urban fabric development – new neighbourhoods or new industrial towns. The sites can initially be isolated – island, peninsula – or segregated with access to transportation infrastructure such as railways and canals. The selected sites are vast to enable facilities expansion. This explains the preference for such locations outside of urbanised areas.

On an architectural scale, the Pulp and Paper Mill morphological structure is directly dictated by the production process. Due to the need for large and open spaces, buildings and facilities structures are mainly built of steel beams allowing large spans. Historically, the skin of the buildings consisted of brick walls but evolved into lightweight metal sheeting. To get the energy to operate, the construction of a power plant or a dam to produce hydroelectricity is required, thus the need for a reservoir to get access to water and create high-enough pressure. The White Birch Mill in Quebec City is part of the city's skyline with its distinctive and noticeable water tower. Such an architectural choice seems to have been driven by the Mill's monumental function as one of Quebec City's major economic components in the 1930s. The industrial cathedral faced the Château Frontenac and the Price building in the upper part of the city.

The Case of Relative Position

With regard to the requalification potential of Pulp and Paper mills in Quebec, it is possible to outline 2 main typologies regarding the relative position of the industry in its urban context

First, the mill propelled urban development and is no longer at its fringe, in fact it is embedded in central position of the urban area. This White Birch Mill in Quebec City is a clear example of such an evolution. At the time of its construction between 1926 and 1928, the mill was built on the north shore of the Saint-Charles river, on the eastern fringe of the urban area. It was, on the other hand, near the resources and directly connected by rail and harbor on the St Lawrence river to the territorial network of exportation. Urban conditions changed over the next 92 years later. The current site relative position is within a 10-minute walking radius (800 m) of Quebec City central districts. This underlined the requalification potential of such a site (see figure 4).

Secondly, the case of an industrial sector having suffered the consequences of a market decline for its production while retaining all the territorial amenities. The peripheral mill is still outside the urban areas, close to resources, a river or any other stream, and kept a direct connection to the territorial export ring. The situation of the Beaupré's Pulp and Paper mill – 30 km east of Quebec City – met those conditions. It was closed in 2009 and demolished in 2010. The structural variables were still active, but the local economy, whether the job opportunities and residential demand were poor for a requalification. While Beaupré is part of Quebec City metropolitan area, inadequate transportation further emphasized the peripheral character of such a site.

Conclusion

These primary observations already suggest that a morphological research of Quebec's Pulp and Paper industry, conducted within a perspective of material knowledge and exploratory planning, could be relevant for planners, architects, stakeholders and policymakers. The results may improve the use and planning of vacant or to-be vacant sites and thus future urban life quality.

This lead-in work is an introduction to a complete research based upon a typo-morphological analysis framework, as part of a graduate student's final project in urban design. The key objective is to delineate in various analytical scales the complex development of the plant layout and transformation in Quebec. The expendability is very low unless all structural variables are met at multiple analytical scales. The most considerable induction is with the multiscale methodology, which could be relevant to other types of sites, buildings and contexts. Above all, this methodology aims for new cohesive requalification projects.
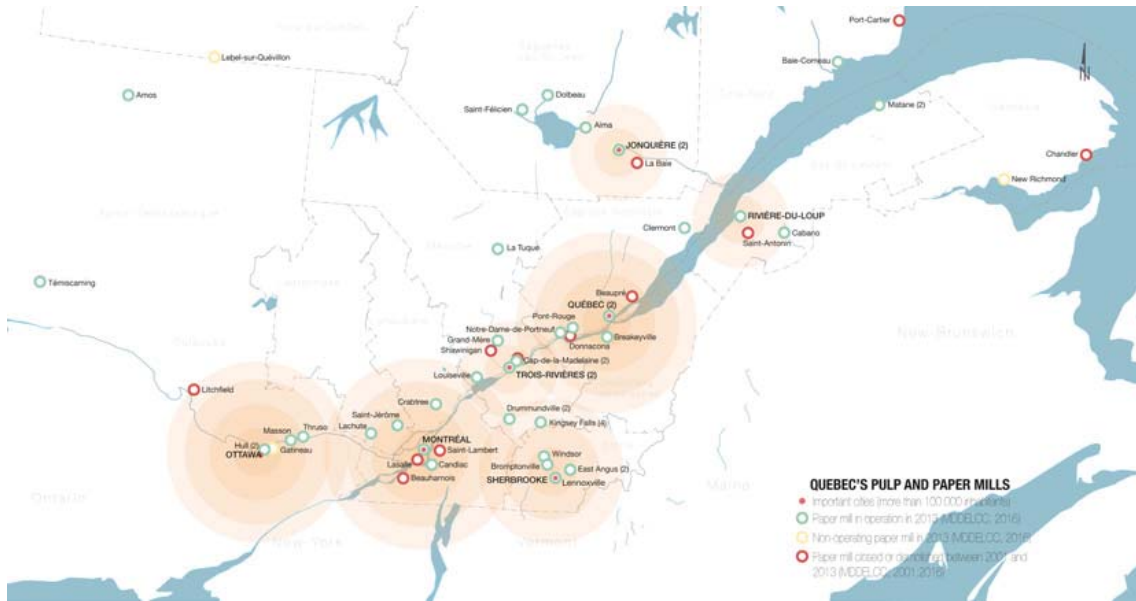
Figure 1. Map of Quebec's Pulp and Paper mills.

	Territory 1:4000 to 1:50000	**Urban** 1:1000 to 1:4000	**Building** 1:100 to 1:500	**Room** 1:25 to 1:50	**Skin** 1:1 to 1:20	**Furniture** 1:1 to 1:10
Layout	Rural cadastre, routes and roads Large assignment and soil treatment	Urban plots, routes and roads Building layout Private and public spaces	Drawings of plans, sections, elevations Suite distribution and aggregation (offices, shops, housing)	Dimensions and proportions (entrance, window(s) and visibility)	Layout and composition of materials (texture, colour, hierarchy)	Furniture form and layout
Program	Economic activities Territory configuration	Permeability of the urban fabric Program and social context	Permeability of suites Access to and control of public, semi-public, semi-private, private, personal spaces	Integrated or isolated space Use of convergence or exclusion	Opacity and transparency Co-presence or isolation Flexibility and privacy (doors) Sharing (open area)	Individual or group layout
Construction	Hydrography topography Energy and transport infrastructure	Walls, gates, fencing Pavement and paths Local infrastructure	Structural system Position, rhythm of supporting elements Mechanical ducts, vertical distribution	Load-bearing elements, partition elements Storage components	Finish installation, assembly and stapling	Assembly and materials
Legal & financial factors	Regulatory framework Agricultural zoning, historical district Population	Cadastre, regulatory framework Population Land use	Parcel Zoning Clients Market	Occupant and use	National Building Code (finishes, lights)	Standards and ergonomics

Figure 2. Morphological framework for analysis.

Figure 3. Multiscale analysis - Structural permenance.
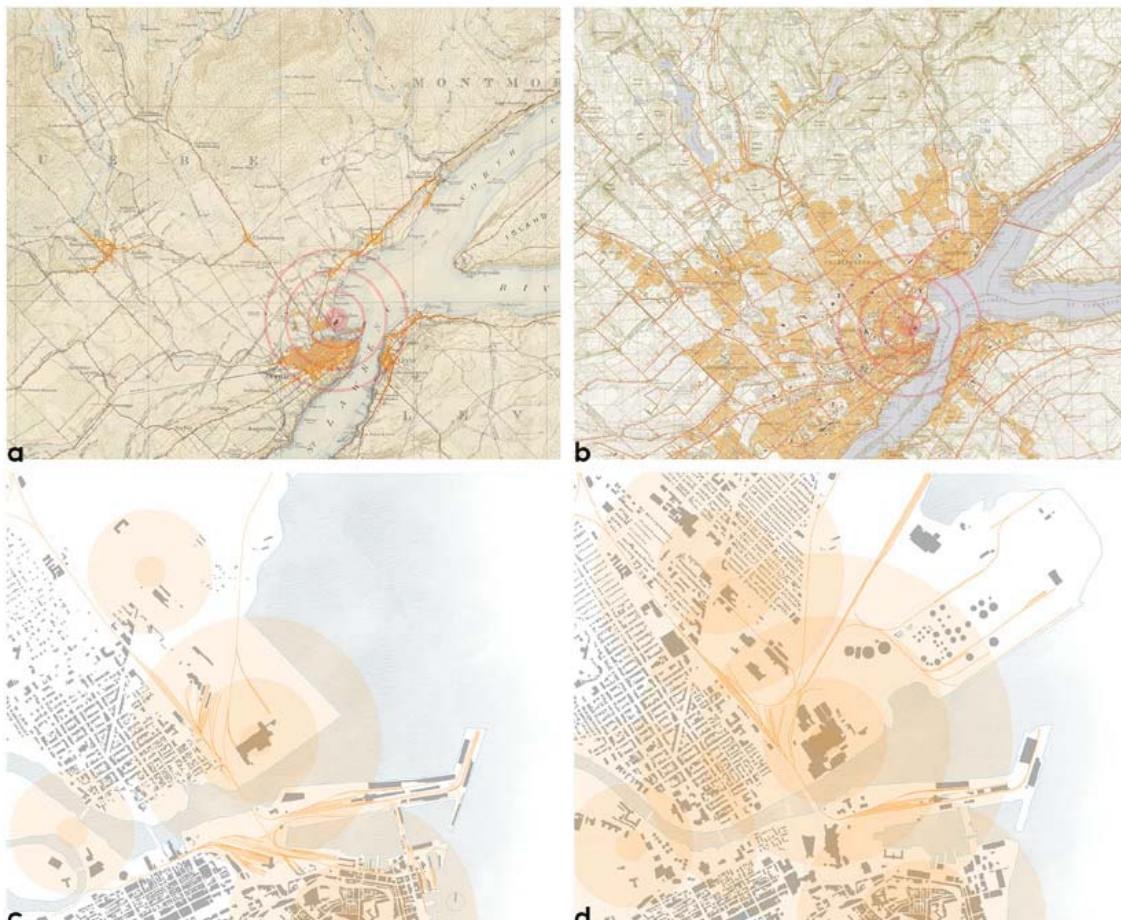
Figure 4. Urban development in Quebec City: the case of relative position of the White Birch Mill.
a. Territorial map of 1929, after edification of the mill (source: BAnQ, SNRC adapted by the author)
b. Territorial map of 2000, illustrating urban sprawl (source: BAnQ, SNRC adapted by the author)
c. Urban scale map of the mill in 1930. (source: Nadon-Roger, 2020)
d. Urban scale map of the mill in 2019. (source: Nadon-Roger, 2020)

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Dyads of an operating thought:
modification & continuity | project & morphology

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Abstract

"The built environment which surrounds us is, we believe, the physical way of being of its history, the way in which it accumulates itself, according to different thicknesses and meanings, to form the specificity of the site not only for what that environment perceptually appears, but for what it is structurally. The place is built from the traces of its own history"   (Gregotti V., 1986).

The Milanese architect's definition seems to allude – implicitly – to conceptual dyads concerning the architecture discipline: *modification-continuity* and *project-morphology*. Reflecting on each dyads' term, the essays intends to "conceptualize" the theme of the project bringing it back to an *eidetic* procedure capable of determining a "modification" – conceived in the manner of a "conscious" act of being part of a pre-existing whole – of the *things* state: both through the recognition of *structural rules* and the identification of *settlement principles* coherent with the *vocation* of the "environment" – or the settlement – hosting the project itself. The theoretical speculation will find concrete relapse in two projectual experiences facing with current issues of urban project: the fragmentation of urban periphery and the *re-signification* of a disused area inside urban fabric.

"The built environment which surrounds us is, we believe, the physical way of being of its history, the way in which it accumulates itself, according to different thicknesses and meanings, to form the specificity of the site not only for what that environment perceptually appears, but for what it is structurally. The place is built from the traces of its own history" (Gregotti V., 1986).

Such Milanese architect's consideration invites us to reflect on the architectural discipline throught a dual *conceptual dyad* – that is, dyads of terms related to a form of though *operating* in the furrow of *essential* conditions: *modification-continuity* and *project-morphology*. Modification is a way through which we define the quality of an *action* that by acting in a pre-existing condition mesures itself with the world of finished *things*. Particularly – in the case of an architectural, urban or territorial organism – with that *morphological-material* condition from which we deduce the *grammatical structure* of architecture and, whose *becoming,* derives from the relationship between two notions which, of the *morphé*, explain the condition of *opposition-complementarity* which takes place to its inside – in the *longue durée* –, and therefore in relation to time. These notions are: modification – precisely –, corresponding to the *other becoming*, and continuity, unfolding of the other becoming. In short, a pair of terms that although – from a logical point of view – might appear contrasting to each other, in reality it seems they acting on a common fund, containing to each other in a latent form.

In fact let's think how it is the modification to ensure the *duration*: that is, the *continuity* which, through a *differentiating*, allows to the process not to be blocked. In other words, what survives, through the process itself, is no longer the "same", but that *becoming other*. Not therefore the inconsistent *sign* of what, being ephemeral, is deficient of reality; but rather what which, considering the *resistance* attitude of reality, of this latter retains its *consistency*.

It is not by chance Vittorio Gregotti, by associating the notion of modification to that of "belonging", alludes to the construction of a real "language of modification" i.e. to a place's "language of knowledge". This aspect refers to an *operativity* of the dyad modification-continuity to feed to the will to sediment the creative process on a structured context and substantially qualified by a threefold character: *organicity*, *transformation* and *recognisability*. Let's try to dwell on each of these terms that qualify a structure. About the character of organicity we intend to refer to the definition provided by Severino – to which, often, Matteo Ieva refers to within his teaching at the Polytechnic of Bari: "*The difference between an organism and a simple aggregate of elements (for example a "heap") consists in the coessentiality of the organism's parts and in the mutual inessentiality of parts of the simple aggregate. If one is removed from a heap of stones, this, separated from the heap, remains what it was before – and the same can be said of the stones that continue to form a heap. If, on the other hand, a part is separated from the other parts of an organism (for example, a limb is cut from a living organism), only in the form of words the separate part is still what it was before, and this separation determines an alteration in all the other parts. (Aristotle observed that an arm detached from the body is only a "painted" arm, that is, it no longer performs the functions for which it is an arm; and the separation of the arm causes a physiological alteration of the whole living organism, which can also succumb)*" (Severino E., 2011).

Beyond a clear distinction between the concept of organism and that of aggregate, this definition, especially by referring to Aristotle, invites us to conceive *organicity* as a character that alludes to a condition that is anything but static and figurative ended in itself. In fact, it is a concept that attributes "meaning" to architecture itself as an inexorable expression of a *transformative principle* underlying it. Muratori for example, by considering the organism as a "moral fact", says that "architecture cannot be made without a sense of the organism" (Muratori S., 1985). He, in particular, by associating the *organism structure* to a category that determines the process – both in its natural and human-civil aspects – he essentially clarifies the presuppositions at the basis of its double reading: spatial-distributive and temporal-evolutionary. In other words: he defines the premise at the basis of a *typological reading,* and thus structural, from which *essential* aspects rela-

ting to the aggregative-evolutionary processes it is possible to derive.

About the concept of transformation, it represents the *conditio sine qua non* a structuring activity – and therefore a structure – through its composition laws, it exists. In fact, if the l*aws of composition* are by nature structuring, such a constant duality or, to be more precise, bipolarity of property, which consists in being, always and simultaneously, *structure* and *structuring*, explains the success of the transformation concept itself which is intelligible in the *misure* in which it is put into practice. Therefore, the quality of a structure of be *transformable* introduces a third character – of the structure itself: that of *recognizability*, and in particular the recognition of an *order* conceived as the *form's constitution law* – with the "form" intended as as the *visible* manifestation of an order –, precisely structured. So a concept, that of order, absolutely significant for the architecture and without which we could not talk about *form* as a way of being of order, but rather only of cumuls of elements – of "heaps" of things, by referring to Severino.

Now, in architecture, the concept of order refers to a dimension that we could define, at the same time, *synthetic-scalar* and *projective* of architectural "facts". In fact, we recognize a first type of *internal order*, that is inherent to the architecture and therefore oriented to identify the *law of selection* and *organization* of the elements that make up the architectural organism. A second type of *relational order* between architecture and the context (urban or territorial) attributable to a *narrative arrangement* not coinciding with the mere description of the facts but rather with the narration of a critical-transformative condition of reality through the search for an operational dialectic between contingencies and latencies inherent to the natural and anthropic context within which we act. And a third type of order corresponding, instead, to that condition contained, *in power,* in the two previous types of orders and with respect to which we would be able to *re-signify* the *architectural thing*.

The latter type of order is defined by Vittorio Gregotti as the "other order". That is, a *new order*, generated by a *creative-projectual act* through which the Gadamerian experience of *truth* is revealed by means the modification of the things *status*. It is essentially the *project order*; that is, the order determined by the *creative act* generated by the complicated dialectic between two categories of factors: those relating to what Agamben defines as the "impersonal sphere", the "power of" (contained in two types of previously mentioned order, that is: the internal order of architecture and the relational order between architecture and context), which bypasses and precede the individual subject; and the intentional ones, the "power of not" (corresponding to the other order, precisely to the project), resistant to the previous ones and with which man – the designer – measures himself. In other words, we could say that creation derives from the relationship between that "genius", the *true creative force* that pushes towards the *opera* and its expression, and the "resistant" character – the critical instance – of the one who tries to curb such a force-impulse in order to mark it with his own imprint (Agamben G., 2017).

The fact of substantially associate the creation act to a "resistant" condition corresponds to identifying the project's idea connected to the own intentionality, in a dialectic between *autonomy* and *heteronomy* in the relationship with what is inherited. This is the reason leads Vittorio Gregotti to brings back the creative act to aspects that are fundamental in order to make concrete and, in some ways tangible, that acting with resistance – for the purpose of recognizing itself as *singular* – of the designer. These aspects concern: "the recognition of father, brothers, children values, or of the story value on which it is necessary to open a dialogue, for each project, alternative to the present"; and "the constitution of a critical distance from the things state, as condition for constructing a truth's fragment of present" (Augè M., Gregotti V., 2016). In other words, it is like the *thought-project*, while setting itself on a *physical-metaphysical* substrate, was able to give to the *opera* that autonomy and that image of *truth* – according to Guattari corresponding to the "ethical-aesthetic autonomization" regime as only "criterion of truth imposed to the architect" (Guattari F., 2013) – which, in the present, makes it comparable to a *monad,* independent and equidistant from the world in which it represents itself – the place of architecture (the architectural organism, the city, the territory) – as much as by the maker, the architect, the designer. That is, by the one

who plays the role of *inter-press* and who, therefore, according to the Severinian meaning of *interpretation*, acts "in the middle of two": *"the visible form of the document or of the historical rest and the 'historical meaning' that is attributed to the visible form"*. For example, the philosopher says by referring to the architecture of ancient world: *"... the interpretation of an ancient Greek temple is placed between the remains of the temple and the representation of the characters of a certain Greek temple in a certain historical period, and states that the visible forms in a certain situation (stones, columns, steps) are the remains of the Greek temple which has those characteristics. The interpretation unifies these visible forms with their historical meaning. And it combines two different dimensions, because other are the ruins of an ancient temple, other is the temple (or the representation of the temple) of which, in the interpretation, only the ruins are left. The interpretation activates the two dimensions, in the sense that it transforms them into two expectations, it satisfies these expectations: the stones are transformed into the remains of a temple, waiting to be told of what temple they are the remains of; knowledge of ancient Greek architecture is oriented towards certain visible forms and put on hold to become properties of these forms. The interpretation takes place when these two expectations are fulfilled ... "* (Severino E., 1989).

The cognitive tool through which to interpret the *constructed matter* is the *morphology*. The designer, by studying it, is able to bring the visible back to a more extensive *meaning* – i.e. the *sensitive form* to a *process* –, activating that level of "projectual reading" – of which Giuseppe Strappa talks about – acting on a dimensional scale and complexity of relationships higher than the single building element and of its *form* as an object. Through the morphological investigation it is possible to provide to the experience of the project the opportunity to recognize and enhance the *tensional relationship* internal at the first of the two dyads: *modification-continuity*. In fact, by promoting knowledge and interpretation of the constitutive signs, this tool – whether it corresponds to an architectural organism or to an urban-territorial fabric made of paths, aggregates, building types – can become a constitutive principle of the design act, because aimed to identify: both the relationship between "signifier" and "meaning" and therefore to substantiate, by attributing to it a concrete form, the otherwise indistinct and chaotic aspects of a pure vision; and to recognize – simultaneously – in the totality and individuality of the *ethical-operational* programmatic processes, the degree of adequacy of a *creative-transformative* act. From here we can see how the second project-morphology dyad basis on the idea that the design act, as a critical experience of "in becoming formal intentionality", must dialogue with the "becoming", that is, with what Aristotle considers as "permanent" and which has the value of "substratum": the structure of the existing.

Now, the brief theoretical speculation on conceptual dyads is reflected in two projectual experiences that have faced current issues of urban planning. Particularly: with the theme of the periphery fragmentation of the contemporary city, the project for the transformation of the Milan Expo area - by G. Strappa (team leader), P. Carlotti, I. Taci, C. Tartaglia, D Nencini, V. Buongiorno, G. Ciotoli, M. Falsetti, I. Del Monaco, V. Mattei, P. Posocco, M. Raitano, P. Marziano, G. Valeri; and with the theme of the re-signification of a disused area internal to the city (project for International Competition concerning Tallin city), by M. Ieva (team leader), N. Scardigno, A. Caporale, A. Camporeale, F.D. De Rosa, G. Volpe.

About the project for Milan periphery, the analysis of the forming phases of the territory has allowed to return a "new order" to the area by transforming and re-organizing the routes intersections into "knotting": a term which indicated a "consolidation process" between routes and urban fabric and which corresponds to an accentuated building density. Particularly the project consists of a "restructuring route" which, by declaring itself extraneous to the geometry of the nearby centuriations, is configured as a new matrix of a "vertical fabric" which connects two new poles: Baranzate and Pero. It is clear – says the project team leader – that "the intention of the proposal to metabolize the modern tradition of public building, often operating as abstraction (Le Corbusier, Mayekawa, Reidy, Fiorentino), within a framework of "territorial realism", but also that of resuming the utopian lesson of the "great extension", using it in the renewed sense of tool

for reading and planning interpretation of the processual discontinuities occurring in the territory" (Strappa G., 2016).

In the competition project concerning the city of Tallinn, the reading of urban fabric's characters has allowed to identify the role of "linear nodality" of the abandoned area between the districts of *Pelgulinn* and *Kalamaja*. Therefore a "nodality" internal to the urban fabric to which the project has attributed the function of a multifunctional urban park. This took place by providing for a new "structuring" of the area through the intersection of existing routes and the subsequent identification of new "nodal places" of the city corresponding to a hierarchical system of "urban courtyards" defined by building volumes differently hierarchized – in height – according to the degree of specialization and position within the park. Among the urban courtyards, the "large square": the center of gravity of the entire park as well as the place where turn out to be "knotted": routes deriving from closed neighborhoods and a dense "built" characterized by an architectural language clearly projected towards what Matteo Ieva defines a new "international rationalism".

Table 1. Project of Milan's Expo area. Collage of the first postunitarian cadastral map showing the roman *centuriatio* aligments (to left); formative phases of the territorial structure (to right). Design team: G. Strappa (team leader), P. Carlotti, I. Taci, C. Tartaglia, D Nencini, V. Buongiorno, G. Ciotoli, M. Falsetti, I. Del Monaco, V. Mattei, P. Posocco, M. Raitano, P. Marziano, G. Valeri.
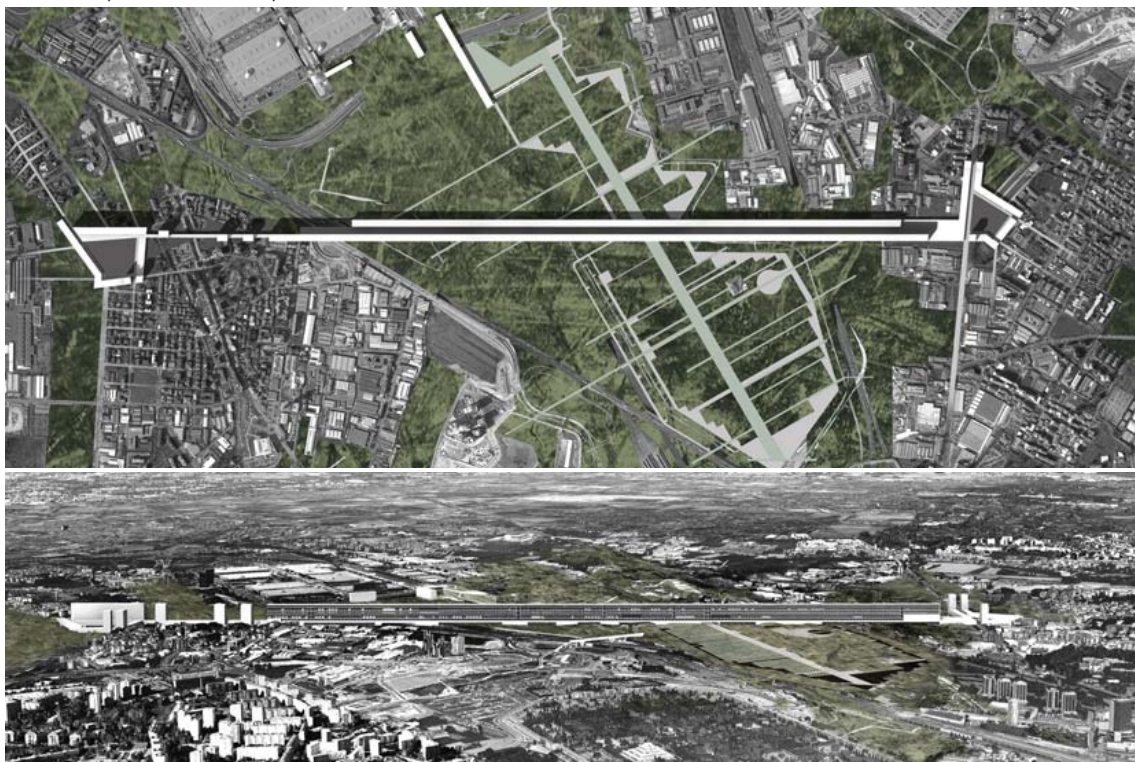
Table 2-3. Project of Milan's Expo area. Masterplan and territorial section showing the "new matrix" of a vertical fabric connecting Baranzate e Pero poles.

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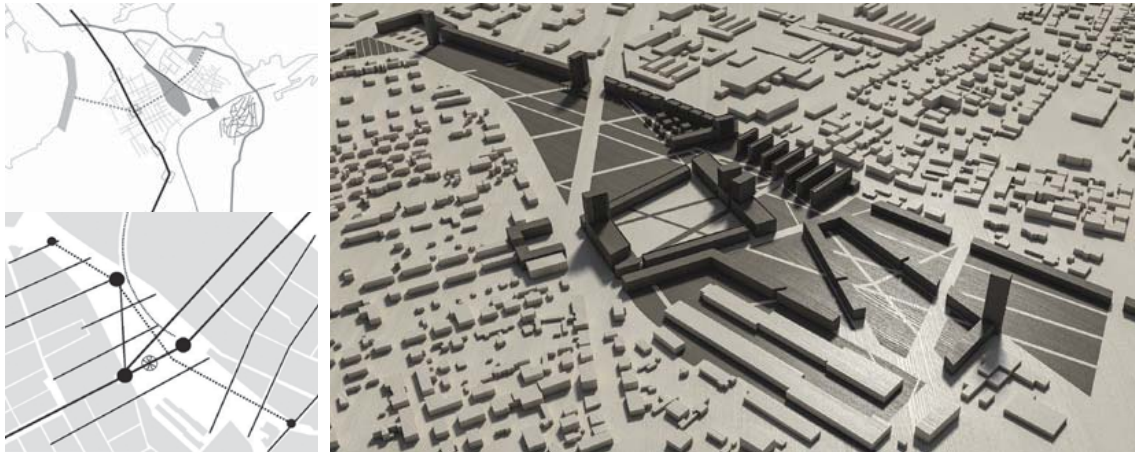
Table 4. Project for international competition: "New habitats, new beauties. Speculation for Tallin 2019". (to left) Reading of Tallin's paths hierarchies and ideogram indicating new area's structuring and project's nodality. (to right) project model. Project team: M. Ieva (team leader), N. Scardigno, A. Caporale, A. Camporeale, F.D. De Rosa, G. Volpe.
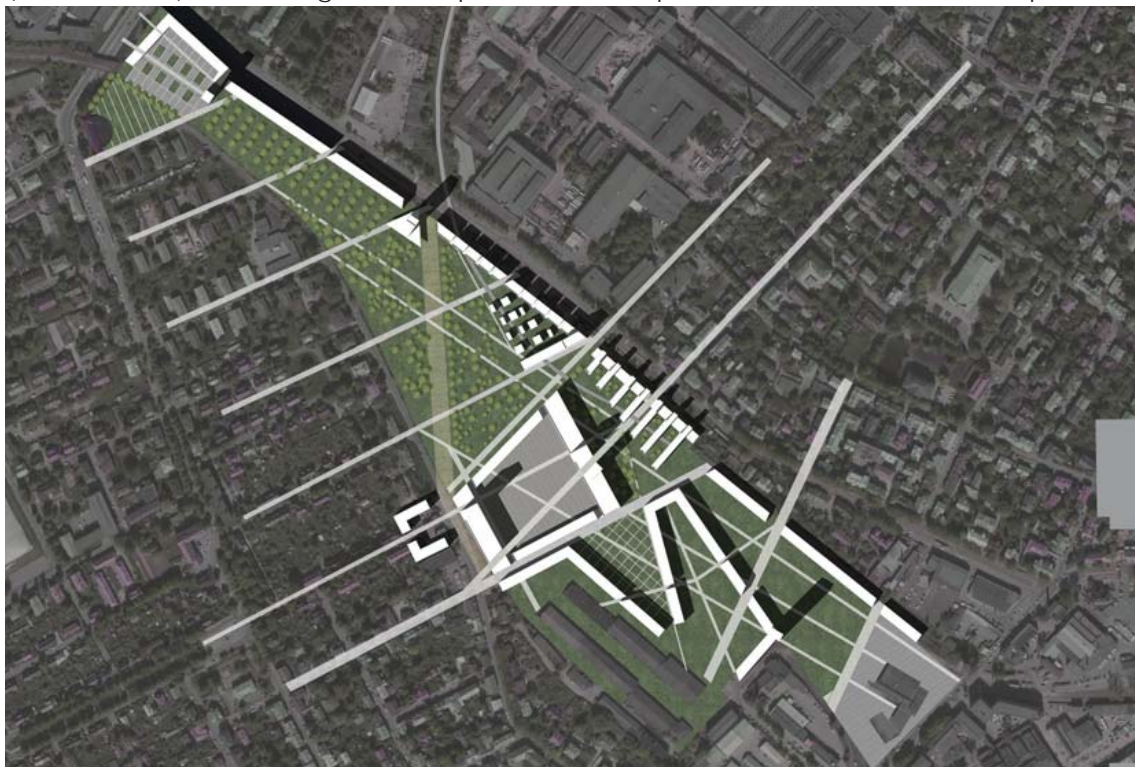
Table 5. Project for international competition: "New habitats, new beauties. Speculation for Tallin 2019". Masterplan of the multifunctional park.

Table 6. Project for international competition: "New habitats, new beauties. Speculation for Tallin 2019". Examples of special building (to left) and residential builgings (to right).

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The Spatial Logic of the Arabian Coastal City
The Case of Doha, State of Qatar and Muscat, Sultanate of Oman

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Keywords: *development, metropolitan, space syntax, topography, urban*

Abstract

The paper presents a comparison between two metropolitan regions located within the Arabian Peninsula: Doha in the State of Qatar, and Muscat in the Sultanate of Oman. Doha and Muscat share many similarities regarding their climate (arid, subtropical desert with low rainfall and hot, humid summers), contemporary population (1.7-1.9 million), metric size (650-720 km²), and historical/cultural origins as coastal settlements. However, the two regions exhibit a sharp contrast between their topography. Doha is characterized by its flatlands with an emergent coast , while Muscate has a rugged coastline and mountainous terrain. The research in this paper controls for axial size (i.e., number of streets represented as lines of sight) in the modeling of the two metropolitan regions for the sake of comparability. In the literature, space syntax research controlling for axial size in this manner revealed clear morphological distinctions in the urban spatial network of different European and American city centers (Major, 2015, Major, 2018). For our case, the paper argues that differences in topographical conditions between the two regions can lead to the adoption of distinct strategies for tailoring spatial structure with urban growth over time. During urban expansion, this was necessary to resolve Hillier's paradox of centrality and linearity with increased physical size (Hillier, 1996, Major, 2018). Furthermore, quantifying the morphological characteristics of Doha and Muscat using space syntax helps to strengthen our understanding of the two cities, and perhaps other cities within the Arabian Peninsula.

Introduction

Over the past few decades, space syntax has extensively been utilized to better understand the urban morphology of cities around the world, particularly in Europe, the United States, and China[1] (Hillier, 1996, Carvalho and Penn, 2004, Chen, 2017). Many researchers have documented the theoretical and methodological strengths/weaknesses of space syntax by both people inside and outside the research community (Ratti, 2004, Hillier and Penn, 2004, Hillier and Vaughan, 2007, Major, 2018). Simultaneously, many morphological studies have used space syntax to demonstrate the growth and development of individual neighborhoods, settlements, and specific parts of the Middle East North Africa (MENA) region. MENA is an acronym for a wide region stretching east-to-west from Iran to Morocco across the Greater Middle East, which is commonly known as the Arab World. The MENA region hosts approximately 381 million people across nearly 8.9 million square kilometers, which represent 6% of the total world population and land area (Source: World Bank). The region also contains approximately 60% of the world reserves for petroleum and natural gas; therefore, it has been a vital source of global stability as well as rapid urbanization and globalization over the past half-century (Source: US Department of Energy).

Some past morphological studies of the MENA region using space syntax includes, but is not necessarily limited to: the academic studies of Istanbul and Izmir (Turkey), Cairo (Egypt), and Doha District of Dammam (Saudi Arabia); heritage studies of Sharjah neighborhoods in Dubai(United Arab Emirates), and Sur Lawatyia in the Mutrah area of Muscat (Oman); walkability measurement in the urban form of central Tripoli (Libya); historical/modern neighborhoods and parks in Doha in (Qatar) as well asseveral settlements in Iran; and commercial studies of settlements like in Jeddah (Saudi Arabia) (Karimi, 1998, Carvalho and Penn, 2004, Abubakar and Aina, 2006, Ferwati, 2010, Ferwati, 2012, Kubat et al., 2012, Mohamed et al., 2014, Can and Heath, 2016, Remali and Porta, 2017, Major et al., 2019, Tannous et al., 2020). Despite this wealthy material, there is still a lack of a comprehensive and consistent attempt to conduct a systematic and methodologically comparison between urban morphology in the MENA region, particularly settlement form within the Arabian Peninsula. There appear to be a few reasons for this lack of knowledge. Namely, most of the space syntax studies concerning these settlements tend to focus on research questions limited to individual case studies. This limitation results in a lack of methodological consistency across the literature. For example, the research questions will help to determine the modeling context; and thus the axial size of each case study. They are not modeled for the purposes of morphological comparison, but most usuallyfor the evaluation and possible intervention in design and planning terms. Finally, large-scale urbanisation is a relatively recent phenomenon within the Arabian Peninsula compared to the rest of the MENA region and the world in general, even though the arabian Peninsula has a long record of settlements dating back some 7,000 years (see **Tables 2** and **3** in **Appendix A**). The continuous changes and growth in the urban fabric of the Arabian cities have made it difficult to accurately capture the rate of the morphological evolution (Scholz, 2014, Salama and Wiedmann, 2013). More general study tend to focus on the morphological classification of types at the local scale, which lacks a metropolitan perspective using network science tools as space syntax (Ünlü and Baş, 2016, Ünlü and Baş, 2017).

The main objective of this paper is to address a gap in our knowledge by conducting a morphological comparison of two major Arabian metropolitan regions (i.e., Doha in Qatar and Muscat in Oman), which share the merits of similar historical origins as coastal settlements. The research in this paper also controls for axial size in the space syntax model of both metropolitan regions based on previous methodology for the purposes of comparability. Major (2015 and 2018) illustrated how controlling for axial size in space syntax modeling can play a profound role in highlighting striking morphological and metric differences in cities across culture and time. Specifically, in comparing the morphology of American and European urban centers that are strongly characterised by either deformed or geometric grids, and different types of American urban centers that are characterised by either orthogonal or offset grids (Major, 2015, Major, 2018).

Doha and Muscat have a clear difference in topography that is primarily characterised

1. Source: www.spacesyntax.com

by flat and mountainous terrain, respectively. Given these differences, we argue that general conditions on the ground can lead each city to pursue entirely different strategies during urban growth in resolving the paradox of Hillier's principles of centrality and linearity (Hillier, 1996, Major, 2018). Space syntax helps to clearly illustrate, quantify, and understand these morphological similarities/differences arising from the topographical conditions in these metropolitan regions within the Arabian Peninsula.

About Doha, Qatar and Muscat, Oman

With the rapid economic growth of the Middle East and the Arabian Peninsula, Gulf Cooperation Council (GCC) countries have recently drawn the attention of popular media and environmental research due to the seemingly 'instant' nature of their urban development. In the 1950s, much of the northwestern coast of the Arabian Peninsula was barren land. However, a different landscape has emerged over the past half-century with rapidly growing cities driven by the production of oil and natural gas. This has led to significant infrastructure- and mega-project investments by national governments (Scholz, 2014, Salama and Wiedmann, 2013). The cities of Qatar and Oman are repectively situated within the east and south-eastern coastline of the Arabian Peninsula along the Arabian/ Persian Gulf and the Gulf of Oman. Qatar is a peninsular nation sharing a single border with Saudi Arabia, while Oman is located on the southwest corner of the Arabian Peninsula and shares borders with the U.A.E., Saudi Arabia, and Yemen (**Figure 1**). They are both known for long summer periods with dry and humid climate.

Mountainous geographical features are more found in the eastern older area of Muscat than the western part of the city, which is mostly flat and bounded by mountains toward the east and southwest. This flat portion provides a more extensive and buildable land area for settlement in the contemporary areas of Muscat (**Figure 2**). The city of Doha is considered rocky and flat with its coastline stretching in a north-south direction along the Arabian Gulf. Large sections of the coastline in Doha have artificial modifications including reclaimed land and islands, as the original shoreline is further inland (**Figure 3**). For referencing, the subsequent sections of the paper discuss key features, roads, and places available in diagrammatic maps of Doha and Muscat.

Since the 1967, revenues from oil exports triggered governmental efforts for settlement growth in Oman with most of the economic development and demographic growth focused on the capital city of Muscat(Scholz, 2014). This growth resulted in a surging demand for housing, commercial storage sites, industry, and public buildings. Within four decades, Muscat developed from a collection of small port towns and agricultural villages into a metropolis housing more than 1.7 million people (Source: United Nations). The municipal (e.g., political) boundaries of the City of Muscat are 246 square kilometers (km^2) whereas the metropolitan region includes 720 km^2 of land area as defined by the bounds of the space syntax model in this paper. The population density in Metropolitan Muscat is approximately 2,400 people per km^2.[2] In comparison, Qatar's rapid growth started in the late 1980s due to technological innovations in the natural gas industry. Like Muscat, revenues from natural gas exports fed urban expansion in Doha over the last 20-30 years (**Figure 4**). Doha is the capital and largest city in Qatar with one of the fastest-growing populations in the Arab World with its population increasing from ~500,000 people to more than 2.3 million in just 20 years (Source: Qatar Ministry of Statistics and Development Planning). Governmental initiatives such as Qatar National Vision of 2030 and investments have embraced and manage this rapid growth. The municipal boundaries of the City of Doha encompass ~132 km^2 of land area whereas the metropolitan region includes ~610 km^2. The population density in Metropolitan Doha is ~3,700 people per km^2. At first glance, these statistics would suggest that Doha is over 50% denser than Muscat. However, this is not the exact case as we will explain later due to the role of topography.

Aggregation and Precedence in Middle Eastern Settlements

The early development of settlements in Doha and Muscat followed the restricted random process based on simple rules for aggregating dwelling units that are previously described

2. Population estimates are rounded off for simplicity's sake.

by Hillier and Hanson (1984). The simplest rule is not to block the access of neighbours to their dwelling unit when constructing your own. This organic process of restricted random aggregation are caused by the actions of local actors to shape the initial morphology of the settlement in concert with generic function (Hillier and Hanson, 1984, Hillier, 1996). Generic function refers to the movement and basic human requirements for occupation such as food, water, and shelter (Major, 2018). This function attributes to the founding of Doha and Muscat in coastal locations adjacent to a bay, namely, for the purposes of economy including pearling, fishing, and water transportation.

In comparison to the European model described by Hillier and Hanson (1984), the process governing restricted random aggregation in Middle Eastern settlements comes with additional rules. The rules include a 'right of precedence' conveying some rights for preceding over successive properties to abide the adjacent physical relationships between neighbours. These additional rules in the Middle East emerge from Islamic religious practice, which is recognized in the physical fabric of settlements where "the environment should be seen as a series of constraints… (which) produce(d) a network of relationships between each owner and his neighbors" (Akbar, 1998; 110-111). Overall, the most important rule is preventing the front doors of new dwelling units from directly facing each another nor placing a window that violates the private life of a neighbor's yard. Although these rules might seem labyrinthine to the casual observer today, they appear to have a well-defined – even sophisticated – spatial and social logic (Major et al., 2019) (**Figure 5**).

As these settlements become physically huge, the spatial logic requires adaptation to resolve Hillier's (1996) paradox of the principles of centrality and linearity in urban form (Major, 2018, Major et al., 2018). This requirement becomes necessary to maintain the center of the settlement accessible to its ever-expanding edges, and successfully mediate between different parts of the urban grid within the collective whole. It is apparent in the diagrammatic representation of continuous urban fabric in both cities over time, which demonstrates the Hillierian concepts in terms of concentric and sector growth theory per Park and Burgess (1925), and Hoyt (1939). (**Figure 6** and **7**).

As described by Hanson, (1989) and Hillier (1996), this process tends to result in blocks becoming more rectangular and streets extending wider/longer which causes the distinctive ortho-radial urban grid that is found in all cities around the world to one or another (Major, 2018). This process is apparent in the emergent superblock structure seen in the figure-ground representation of one/two square kilometers of Old Doha (**Figure 8**, top). It includes the hierarchal differentiation of street widths within the restored Souq Waqif (at the center), particularly in comparison to the wide Al Corniche Road toward the immediate north, and the more rectangular blocks in the surrounding areas. There is less evidence of this process in the figure-ground representation of the Mutrah area in Old Muscat, but it is still apparent along the wide Al-Bahri Road of the Mutrah Corniche and Mutrah High Street that runs in a north-south direction to the center of the area (**Figure 8**, bottom). As we shall see in the space syntax modeling of the metropolitan regions, the resolution of this paradox during rapid urban expansion as well as the topographical differences between the two cities combined with having a profound effect on their emergent spatial structure.

The Spatial Logic of Doha and Muscat

The space syntax model of Metropolitan Doha includes the continuous urban fabric stretching east-to-west from the Arabian/Persian Gulf to inside of the G-Ring/Orbital Highway (excluding this orbital road itself), and north-to-south from Lusail City to Al-Wakrah.[3] It contains <22,000 streets represented by axial lines over a metric area of 650 km[2] (**Table 1**).[4] The space syntax model of Metropolitan Muscat stretches east-to-west from Al-Bustan to Al-Mawaleh, and north-south from the Gulf of Oman to Murayat (Al-Amarat) and Al-Hajar mountains. It

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3. The G-Ring/Orbital Highway was not utilised as a map bound due to large stretches of vacant land between this orbital road and the continuous urban fabric of Doha. Construction of the axial maps is detailed in Appendix B.
4. Named streets and axial lines are not always consistent especially in settlements of the Old World. However, we will refer to axial lines as streets and use rounded-off numbers from this point forward in the paper for the simplicity's sake.

contains <21,000 streets encompassing a metric area of 720 km². The axial size of Metropolitan Doha and Muscat serves as the initial control variable in this comparative analysis based on literature methodology (Major, 2015, Major, 2018). The difference in axial size is ~5%, which sheds the light on some key metric and morphological differences between Doha and Muscat using space syntax.

Table 1: Summary table of metric area (km²), mean depth from the most integrated street and its radius measure, number of axial lines, number of 1-connected lines, and the line density/km² in Metropolitan Doha and Muscat.

City	Area (km²)	Mean Depth	Axial lines (streets)	1-Connections (%)	Population (Million)	Population density (perkm²)	Density (street/km²)
Metropolitan Doha	**650**	**7.5**	**22,478**		**2,382,000**	**3,665**	**35**
Less one connection		6.4	20,638	8.2%	-	-	32
Metropolitan Doha (w/o airport)	**610**	**-**	**22,246**	**1.0%**	**-**	**3,905**	**36**
Less one connection (w/o airport)	-	-	20,473	8.0%	-	-	34
Metropolitan Muscat	**720**	**20.52**	**21,376**	**-**	**1,720,000**	**2,389**	**30**
Less one connection	-	12.8	15,869	25.8%	-	-	22
Metropolitan Muscat (w/o airport and mountains)	**300**	**-**	**19,445**	**9.0%**	**-**	**5,733**	**65**
Less one connected (w/o airport and mountains)	-	-	14,662	24.6%	-	-	49

[1] Mean depth rounded off to the nearest whole number, which is indicated in parenthesis.

According to the Qatari and Omani municipalities, the population of the metropolitan regions is ~2.4 million in Doha and <1.7 million in Muscat.[5] These statistics interpert into a population density of <3,600 people/km² in Doha and ~2,400 people/km² in Muscat. Initially, these numbers suggests that Doha is <50% more dense in population than Muscat. However, this appears to be an artifact of the inclusion of the mountainous areas of Muscat, which accounts for nearly 60% of the metric area with 420 km² of the current unbuildable land. The street density in Doha is~35 streets/km² whether with or without the airport lands. The street density in Muscat is more comparable to Doha at ~30 streets/km², representing a difference of ~15% between the two cities. However, street density in Muscat dramatically rises to 65 streets/km² in the absence of the mountains and airport lands. This suggests that Muscat is <81% denser than Doha in terms of a buildable area based on street density. This seems to be confirmed since this approximately interpert into a population density of ~5,700 people/km² for the buildable area. This street density is even more remarkable considering the number of one-connected streets in Muscat without the mountain and airport lands(i.e., ~4,800 streets). Even with the removal of these one-connected streets, the street density remains 49 streets/km² (<44% compared to Doha). In contrast, the number of one-connected streets in Doha (8%) is similar to the previously found for 10 European city centers (Major, 2015). In Doha, this artificat is primarily due to the influence of development patterns (i.e., suburban layouts). In Muscat, it appears to be an effect of both suburban development patterns and edge conditions throughout the metropolitan region due to elevation changes in the topography. Collectively, this has widespread implications for the urban functioning of both cities in terms of spatial structure.

Despite constructing several models, only the most relevant are presented in this paper. The space syntax model of global choice with all streets highlights the major road network of through-routes in each city. Global choice is measured based on all streets receiving a value of 1, proportionally sharing that value amongst all streets immediately connected to it, and then totaling the amount of reciprocally-shared values for all streets. Choice tends

5. Doha and Muscat refer to the metropolitan regions from this point forward in the paper for the simplicity's sake.

to represent the pattern of through-movement in an urban spatial network. In Doha, this representation includes the core of Salwa Road and the D-Ring Road/Doha Expressway as well as the other successive series of ring roads (A-E) radiating outward from Doha Bay to the metropolitan edges. In Muscat, the representation highlights the major east-west routes parallel to the coastline and heading north-to-south through and around the mountains (**Figure 9**). Global choice also highlights the entire Mutrah Corniche ring sequence connecting around Old Muscat (Mutrah and Al-Alam Palace) to the contemporary resort area of Al-Bustan in eastern Muscat.

An axial map without one-connected streets was also examined at varies radii for a more straightforward representation of the fully-distributed urban spatial network in both cities. This representation provides a pure network view of the urban morphology in the citysince cul-de-sacs have little contribute to the systematic functioning of the urban spatial network in terms of configuration other than providing access to individual lots and drawing segregation to the most isolated streets (Major, 2015, Major, 2018). We acknowledege these streets are segregated, so there is nothing additional to be gained by retaining them within the model. Our purpose is to understand the network, not the edges of that network. Because Doha is relatively flat, it utilizes a similar number of cul-de-sacs as European Cities and American cities (8% and 5% being the average, respectively) primarily due to suburban-type layouts (Major, 2015 and 2018). However, because Muscat has hilly topography that is unbuildable without major earth-moving interventions, it has a full quarter (26%) of all axial lines at the metropolitan level with only one connection due to a combination of suburban-type layouts, mountainous access roads, and cul-de-sacs at the edge of steep changes in elevation.

When we run integration analysis, it can be seen that the removal of one-connection roads has no change on the predominant pattern of choice in regards to Doha's predominant structure, while Muscat exhibit a strong linear pattern (**Figure 10**). The ortho-radial spatial structure of the urban grid in Doha remains consistent in the space syntax model of integration based on the mean depth. The radius is set using the mean depth from the most integrated street in the city, i.e., the longest length of Salwa Road (6.4) (**Figure 11**).[6] However, Muscat's polycentric structure becomes highlighted because of the predominantly linear structure based on the mean depth of the most integrated street.[7] It highlights four distinct areas in the pattern of integration at this radius: Old Muscat (northeast), Al-Amarat (southeast in the mountains), modern Muscat (center), and the Al-Mawaleh region (northwest) between the Sultan Qaboos University and Muscat International Airport. This demonstratation reveals the polycentric nature of the spatial structure in the urban grid caused by the topographical constraints on buildable area in the city.

Discussion of Findings

The analysis demonstrates that both cities have to pursue subtlety different spatial strategies for design and planning decisions due to topographical conditions. Theoretically, the flat topography of Doha allows urban growth in all directions from the coast. However, this abundant land is mostly barren and desert-like except along the coast. Therefore, the urban form of Doha has to remain relatively compact and dense during urban growth due to the local climatic conditions. The political boundaries of its metropolitan area (132 km²) are only a little larger than the political boundaries of San Francisco, California USA (121 km²).[8][9] Collectively, this gives rise to a relatively coherent and easy-to-understand emergent spatial structure in the city. Doha resolves Hillier's (1996) paradox of the principles of centrality and linearity by balancing these formal characteristics at both the macro- and micro-scale of the ortho-radial grid, in a similar manner detected using space syntax in other cities of the

6. In this case, rounded down to the near whole number.

7. The radius is set using the mean depth from the most integrated street in the city, i.e., a relatively long, straight portion of Sultan Qaboos Street (12.8) at the center of the urban spatial network in modern Muscat.

8. Source: Qatar Municipality of Development Planning and Statistics/US Census. The political boundary of metropolitan Doha as set by the Qatar Ministry of Municipality and Environment is much smaller (about 5 times less) than the bounds of the space syntax model of Metropolitan Doha in this paper.

world (Major, 2018). This detection is most obvious in the clear layout of ring roads (A-E) and highly integrated radial routes such as Salwa Road and Al Rayyan Road in the city radiating outward from the coast and Old Doha.

In contrast, the urban expansion of Muscat accounts for the stark differences between total land area and real buildable area in the city due to its mountainous terrain. The emergent spatial structure of the city reflects these topographical conditions and morphological realities, which leads to stark differences in the spatial structure at the macro- and micro-scale of the metropolitan region. The planning of Muscat privileges linearity (specifically for vehicular movement) at the macro-scale to overcome the local topographical conditions. This is most obvious in the layout of linear road sequences in an east-to-west direction and the shorter streets making cross-connections in the narrower north-south direction of the metropolitan region. Simultaneously, Muscat privileges an intense form of centrality (specifically for walkability) at the micro-scale of the spatial structure in different areas such as Mutrah, Modern Muscat, Al Amarat, and Al Mawaleh. We could describe the spatial structure of Muscat as a kind of morphological polycentrism that is physical and topographical in nature. This conclusion is different from previous research about a kind of functional polycentrism based on the privileging of street segments via integration and angular choice in distinguishing the pattern of land uses arising in the spatial structure of some cities (Mirincheva, 2015). In any case, the emergent spatial structure of Metropolitan Doha and Muscat offer an interesting contrast despite their similar origins as coastal settlements for a better understanding of the modern Arabian metropolis. Muscat is compact and dense in its parts whereas Doha as a whole.

Conclusion

The paper presented a morphological comparison using space syntax of two metropolitan regions on the Arabian Peninsula: Doha (Qatar), and Muscat (Oman). Rapid urbanisation and globalisation characterised both cities over the last twenty years. Doha and Muscat possessed strong similarities in terms of historical origin as coastal settlements. A distinct contrast between the two cities was topography. The paper argues that this topographical difference leads to distinct strategies for spatial structure in resolving the paradox of Hillier's principles of centrality and linearity during urbanisation. The planning of metropolitan Doha prioritized compactness and density for balancing centrality and linearity in spatial structure at the macro- and micro-scale of its ortho-radial grid. This compactness occurs despite the availability of abundant land in all directions due to the relative barrenness of that land. The planning of metropolitan Muscat prioritized linearity in its spatial structure at the macro-scale to overcome topographical conditions in the area. To compensate, Muscat privileged centrality and density at a more localized micro-scale level based on a buildable area in generating a distinctive spatial structure based on morphological polycentrism. Space syntax helped to better understand these morphological differences and address an important gap in our knowledge about cities within the Arabian Peninsula.

Appendix A

Table 2: A table of the oldest, continually-inhabited settlements and largest cities today on the Arabian peninsula with an estimated population based on various sources (compiled by Authors).

Settlement	Location	Founded (approximate)	Population (estimated)	Age (approximate in years)
Jubail	Saudi Arabia	c. 5000 BCE[1]	+/- 800,000[2]	+7000
Ras Al Khaimah	U.A.E.	c. 5000 BCE[1] (c. 3000 BCE)	+/- 345,000[3]	+7000 (+5000)[1]
Tārūt Island	Saudi Arabia	c. 5000 BCE[1]	+/- 78,000[4]	+7000
Manama	Bahrain	c. 3000 BCE[1]	+/- 0.5 million[5]	+5000
Ma'rib	Yemen	c. 1500 BCE[6]	+/- 300,00[7]	+3500
Medina	Saudi Arabia	c. 622 BCE[8]	+/- 2.2 million[9]	+2500
Al-`Ula	Saudi Arabia	c. 500 BCE[10]	+/- 32,000[4]	+2500
Dibba Al-Hisn	U.A.E.	c. 100 BCE[11]	+/- 12,000[12]	+2000
City	**Location**	**Founded** (approximate)	**Population**[1] (estimated in millions)	**Age** (approximate in years)
Jeddah	Saudi Arabia	c. 550 BCE[2]	+/- 4.3	+2500
Muscat	Oman	c. 550 BCE[3]	+/- 1.5	+2500
Mecca	Saudi Arabia	c. 100 CE[4]	+/- 1.7	+1900
Sana'a	Yemen	c. 530 CE[5]	+/- 1.7[6]	+1480
Doha	Qatar	1681 CE[7]	+/- 2.4	+335
Abu Dhabi	U.A.E	1793 CE[8]	+/- 2.8	+250
Dubai	U.A.E	1787 CE[9]	+/- 2.8	+230
Riyadh	Saudi Arabia	1737 CE[10]	+/- 6.9	+270

Ancient Arabian Settlements

[1] There is not any reference to these founding dates for Al Jubail in Saudi Arabia, Ras Al Khaimah in the U.A.E., or Tārūt Island in Saudi Arabia. The common reference date appears derived from archaeological evidence in the region of the Dilmun or Telmun people – an ancient Semitic-speaking polity in Arabia recorded from the 3rd millennium BC onwards – who settled along the coast of the Arabian/Persian Gulf specifically with regards to founding of Manama, Bahrain referenced in Al-Nabi, M.N. (2012) *The History of Land Use and Development in Bahrain* Information Affairs Authority; see also see *Smith, S (2013) "Bahrain digs unveil one of oldest civilizations". BBC News, 21 May 2013. The Government of* Ras Al Khaimah references the age of 5,000 years, https://www.rak.ae/wps/portal/rak/about/ras-al-khaimah/facts, retrieved 21 September 2019.

[2] 2011, General Statistics Authority, Kingdom of Saudi Arabia.

[3] 2015, *The Government of* Ras Al Khaimah, https://www.rak.ae/wps/portal/rak/about/ras-al-khaimah/facts.

[4] 2010, General Statistics Authority, Kingdom of Saudi Arabia.

[5] 2010 Bahrain Census referenced in Ben Hamouche, M. (2008) *Manama: The Metamorphosis of an Arab Gulf City*. New York/London: Routledge.

[6] The approximate founding date of Ma'rib, Yemen, in 1500 BCE derived from www.historyfiles.co.uk.

[7] 2012, Central Statistical Organization, Republic of Yemen.

[8] The approximate founding date of Medina, Saudi Arabia in 622 BCE, appears derived from Arabian Peninsula, 1000 B.C.–1 A.D." In *Heilbrunn Timeline of Art History*. New York: The Metropolitan Museum of Art, 2000; http://www.metmuseum.org/toah/ht/?period=04&region=wap (October 2000) and Makki, M.S. (1982) *Medina, Saudi Arabia: a geographic analysis of the city and region*. Amersham, Bucks: Avebury.

[9] 2016, General Statistics Authority, Kingdom of Saudi Arabia.

[10] "Al 'Ula: Within the Saudi Arabian desert lies a 2,000year-old ghost town made of stone and mud," *Atlas Obscura*, https://www.atlasobscura.com/places/al-ula, retrieved,

21 September 2019. This founding date of Al 'Ula may be derived from the *UNESCO World Heritage* Al-Hijr Archaeological Site (Madâin Sâlih), https://whc.unesco.org/en/list/1293; retrieved 21 September 2019.

[11] The approximate founding date for Dibba Al-Hisn derived from Abed, I., Hellyer, P. (2001) *United Arab Emirates: A New Perspective. Cape Town, South Africa:* Trident Press.

[12] 2015, Statistical Offices of the Emirates, United Arab Emirates.

Arabian Cities Today

[1] Estimated population extracted from various sources circa 2015-2018 unless otherwise noted including General Statistics Authority, Kingdom of Saudi Arabia; Ministry of Economy, United Arab Emirates; Qatar Planning and Statistics Authority; Sultanate of Oman, National Centre for Statistics and Information.

[2] Ministry of Hajj and Umrah, Kingdom of Saudi Arabia.

[3] The approximate founding of Muscat, Oman, in 550 BCE derived from *Rice, M. (1994) The Archeology of the Arabian Gulf. New York/London: Routledge.*

[4] The founding date of Mecca, Saudi Arabia, derived from the Roman occupation of Hejaz in 106 CE though there are many scholarly disputes about the true origins of the settlement.

[5] The founding date for Sana'a, Yemen derived from a Syriac account of the settlement as *Auzalites* per Chisholm, H, Ed. (1911) "Sana," *Encyclopædia Britannica.* 24 (11th ed.), Cambridge University Press. pp. 125–126.

[6] 2004, Central Statistical Organisation, Republic of Yemen. Online estimates are indicating the population of Sana'a, Yemen, is 3.9 million people today without an indication of a reliable source.

[7] Founding date of 1681 CE derived from Carmelite Convent records refer to the village of Al Bidda (Doha was a village offshoot of nearby Al Bidda) in Billecocq, X.B. (2010) *Le Qatar Et Les Francais*. Paris: Collections Relations Internationales & Culture.

[8] Estimated date of *Al Bu Falah* subsection (including Al Nahyan family) of *Bani Yas* Bedouin confederation migration to the island of Abu Dhabi.

[9] Approximate date of construction for the Al Fahidi Fort (Today, the Dubai Museum).

[10] Cybriwsky, R.A. (2013) *Capital Cities around the World: An Encyclopedia of Geography, History, and Culture.* Santa Barbara: CA, USA: ABC-CLIO.

Table 3. A table of twenty of the oldest, continually-inhabited cities around the world with an estimated 2015 population greater than 1 million people (Major and Al-Nabet, 2018).

Settlement	Location	Occupation Since (approximate)[1]	Founded (approximate)	Population (estimated 2015 in millions)	Age
Athens	Greece	c. 10-6th Millennium BCE	5-4th Millennium BCE	+/- 3.7	+6000
Gaziantep[1]	Turkey	c. 3650 BCE	c. 3650 BCE	+/- 1.5	+5600
Aleppo[2]	Syria	c. 3650 BCE	3650 BCE	+/- 1.8	+5600
Beirut	Lebanon	c. 3000 BCE	3000 BCE	+/- 2.0	+5000
Damascus	Syria	c. 6300 BCE	3000 BCE	+/- 1.7	+5000
Jerusalem	Palestine	c. 5000 BCE	2800 BCE	+/- 1.5	+4800
Varanasi	India	1800 BCE	1800 BCE	+/- 1.2	+3,800
Luoyang	China	c. 1600 BCE	c. 1600 BCE	+/- 1.7	+3,600
Lisbon	Portugal	4500-2000 BCE	c. 1200 BCE	+/- 2.8	+3,200
Beijing	China	23rd Millennium BCE	1045 BCE	+/- 21.5	+3,000
Xi'an	China	c. 4700 - 3,600 BCE	1100 BCE	+/- 12.9	+3,000
Tripoli	Libya	c. 700 BCE	700 BCE	+/- 1.1	+2,700
Rome	Italy	c. 12-8th Millennium BCE	753 BCE	+/- 4.3	+2,700
Istanbul	Turkey	c. 6th Millennium BCE	685 BCE	+/- 14.6	+2,700
Benghazi	Libya	c. 525 BCE	525 BCE	+/- 1.1	+2,500
Peshawar	Pakistan	c. 400 BCE	c. 400 BCE	+/- 4.2	+2,400

Alexandria	Egypt	332 BCE	332 BCE	+/- 4.5	+2,300
Seville	Spain	c. 700 BCE	c. 700 BCE	+/- 1.5	+2,200
Paris	France	c. 4200 BCE	52 BCE	+/- 12.4	+2,000
London	UK	c. 4500 BCE	43 CE	+/- 14	2,000

[1] Not necessarily continuous inhabitation.

[2] There is some debate in the literature about the site of the ancient city (Antiochia ad Taurum) associated with these two settlements.

Appendix B

About Space Syntax Measures

To describe and analyze spatial configuration using space syntax, an axial map of the open space structure of the urban space is necessary. Firstly, the open spaces are divided into the fewest number of the largest 'convex spaces.' A convex space is a space through which no tangent to the boundary can be drawn, which crosses any part of the space. These convex spaces will consist of the least set of fattest ones that cover the whole system of open spaces. For large urban systems such as cities with well-defined streets spaces, it is usually not necessary to draw the convex map before drawing the axial map. You can directly proceed to drawing the axial map based on the open space structure in a plan for the minimum set of lines necessary to cover all the convex spaces as defined by building facades. The procedure for the (a) open space structure, (b) convex space map, and (c) the corresponding axial map is shown graphically in **Figure B1**.
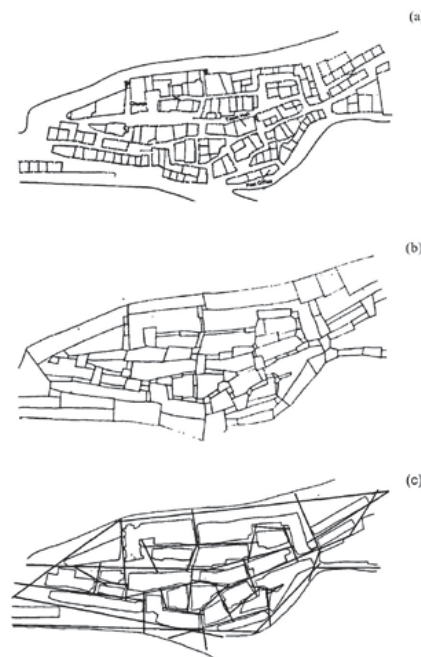
Figure B1. The procedure for modeling an axial map (Hillier and Hanson, 1984).

An axial map represents the least set of the longest and fewest straight lines of sight and access that pass through all convex spaces. Once an axial map is obtained, it can be analyzed as a system of relations. Hillier and Hanson (1984) define the relation of all axial lines in the system as measured by two basic properties of "symmetry-asymmetry" and "distributedness-nondistributedness." What this means is the degree by which urban space is composed of rings of circulation or sequences that form trees. Today's software can auto-generate axial maps using shapefiles, but there is still great value in researchers drawing the axial map themselves in the computer to learn more about the urban morphology of the settlement or city.

Connectivity: Connectivity is a simple measure of how many other streets does a single

street immediately connect to within the network.

Global Integration: Global integration is the relativized mean depth of a space in relation to all other spaces in a network based on changes of direction. It represents how integrated/shallow or segregated/deep is a space within the urban network. In this sense, global integration represents where you are in relation to everywhere else in that network. According to the theory of natural movement, spaces with higher levels of integration tend to carry higher levels of movement; and hence, a greater potential to access different varieties of land use (Hillier, 1996, Hillier et al., 1993). Globally integrated spaces tend to play a larger role in the urbanity of a city. These spaces are not only more frequently visited as destinations but also more intelligible for carrying through movement where people are on their way daily from somewhere to somewhere else in the city. It is often useful to limit the radius measurement of integration based on the relativized mean depth from the most globally integrated street in the urban spatial network because it reduces – though not necessarily eliminates completely - the 'edge effect' of global integration, i.e., spaces at the edges of the urban spatial network tend towards segregation because of their location on the edge. Integration shows the pattern of 'to-movement' in the sense of those streets that are most likely to be utilized for segments of journeys from anywhere to almost everywhere else in the urban network.

Local Integration: Local integration measures relativized mean depth up to three (3) changes of direction away from an origin space. It is a more immediate measurement of the local catchment area of a single space within the network. The simplest way to understand local integration is if a person imagines themselves standing in the middle of an intersection of two or more spaces and look down the streets in all directions to see all other streets immediately connected to those streets defining that intersection. In this sense, local integration is a measure of locality similarly to connectivity.

Global Choice: Global choice is a measurement of 'through-movement' based on giving every street in the urban spatial network represented as an axial line a value of 1, then proportionally sharing that value amongst all its immediate connections. The shared values for every street are then added up to provide a measurement for the degree of importance of that street within the urban spatial network. Global choice tends to highlight the primary routes within the entire urban spatial network.

Figure 1. Map of the Middle East region highlighting Qatar and Oman (Images: Perry-Castaneda Library, University of Texas).
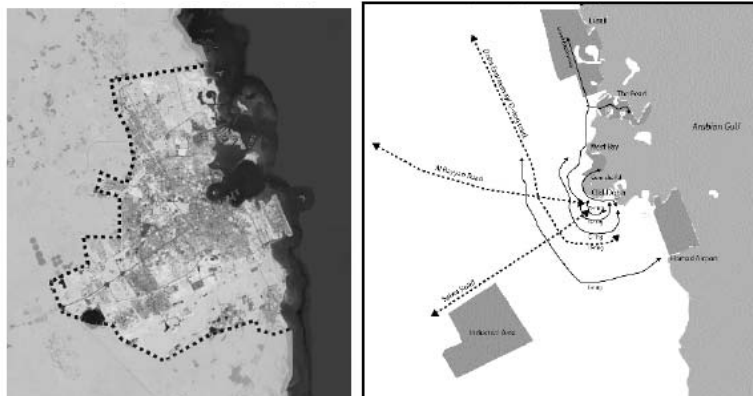
Figure 2. (Left) Satellite views of Doha from with the metropolitan bounds of the space syntax model outlined and (right) diagrammatic map of key features, roads, and places (Source: Google Earth/Authors).
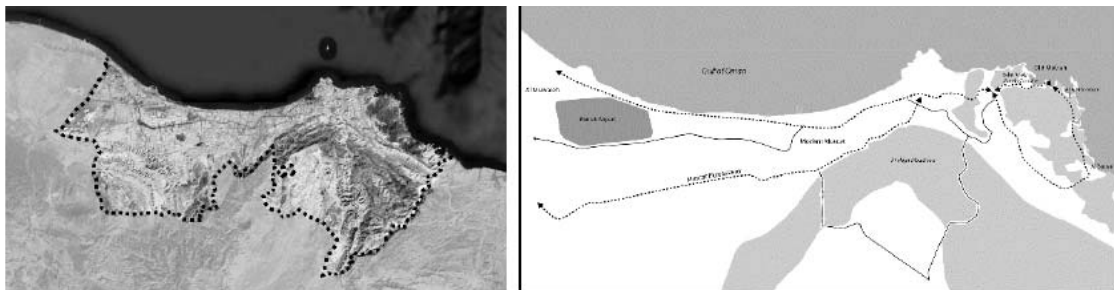
Figure 3. (Top) Satellite views of Doha from with the metropolitan bounds of the space syntax model outlined and (bottom) diagrammatic map of key features, roads, and places (Source: Google Earth/Authors).

Figure 4. Bird's eye views of the urban fabric in (left) Old Doha circa 2010 with Doha Bay and the modern skyscrapers of West Bay in the background and (right) Old Muscat in Al-Ariana, Jebel, and Mutrah in 2005 (Images: Qatar Museums/Muscat Municipality).
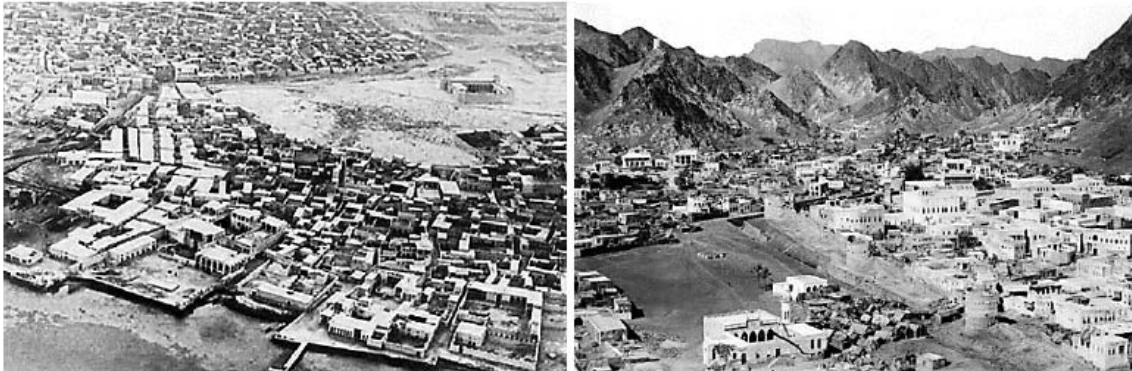
Figure 5. Aerial historical photographs of (left) Old Doha showing the Souq Waqif and Msheireb areas in the 1940s and (right) Old Muscat showing the Mutrah area circa 1900 (Images: Qatar Museums/(Zmewer, 1900).
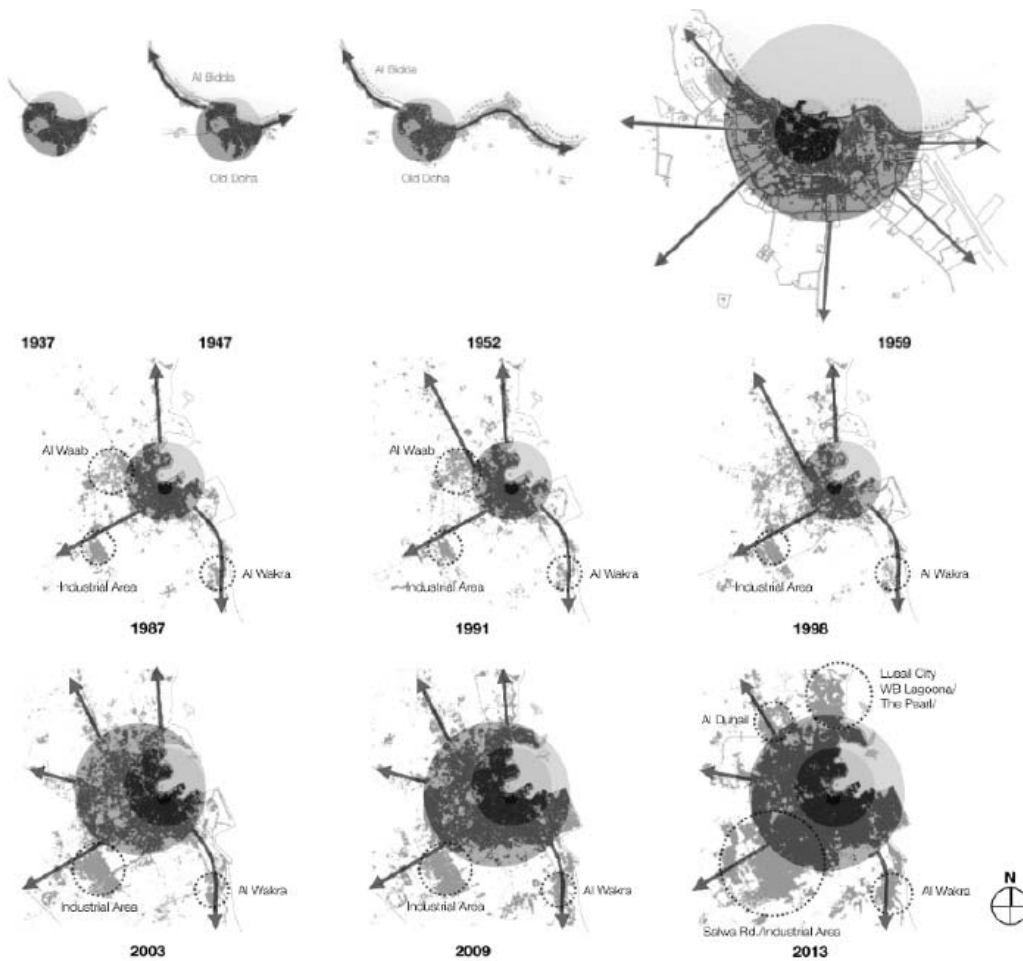
Figure 6. The growth of Doha, 1987-2013 (base from (Salama and Wiedmann, 2013) – centrality and linearity growth diagram overlay by Authors) .

The base images for the top row illustrations from 1937-1959 are from Jaidah and at a different scale compared to the base images for the bottom two rows of 1987-2013 from Jaidah, I. & Bourennane, M. (2010). *The History of Qatari Architecture 1800-1950*, Italy, Skira, Salama, A. & Wiedmann, F. (2013). *Demystifying Doha: On Architecture and Urbanism in an Emerging City*, London and New York, Routledge.. Also Figure 6 and Figure 7 are not set to the same metric scale.
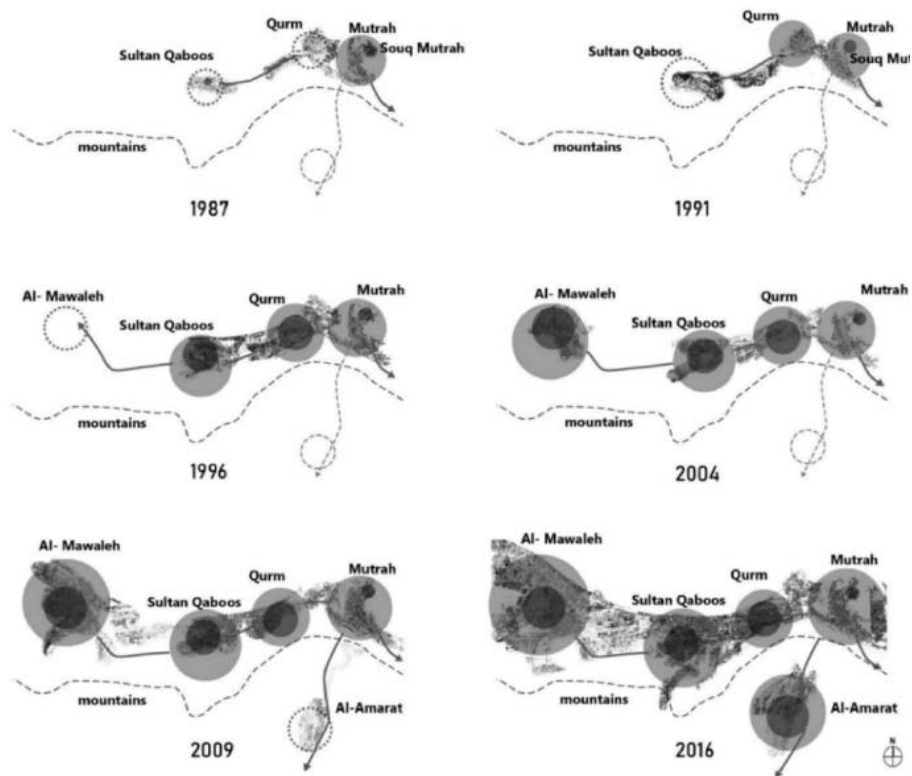
Figure 7. The growth of Muscat, 1987-2013, with a diagrammatic representation of centrality and linearity during urban growth.
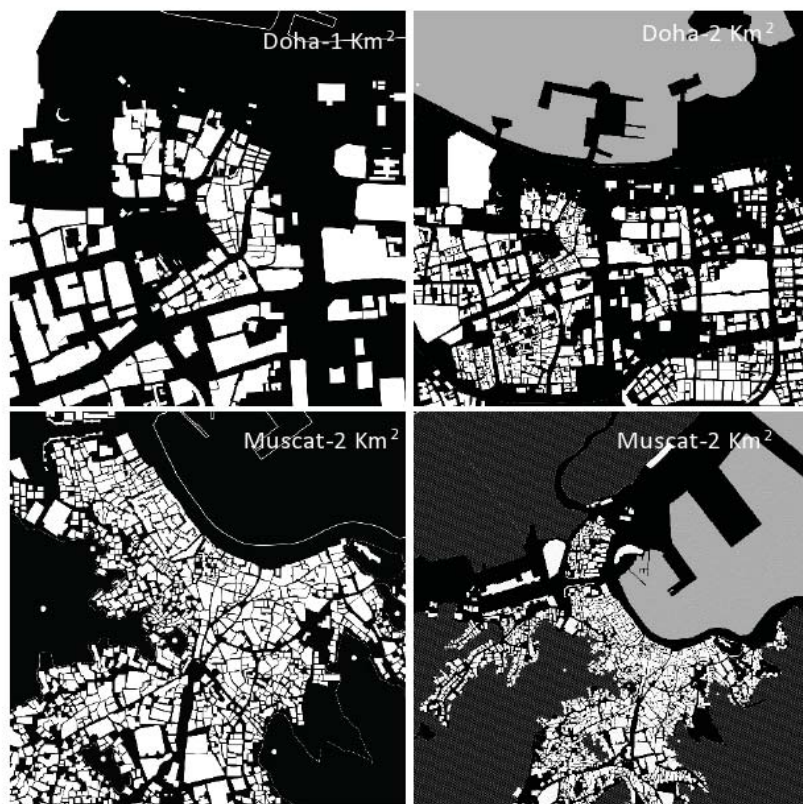
Figure 8. Figure-ground one/two square kilometer area in the urban fabric of the older neighborhoods in (top) Doha and (bottom) Muscat.

Figure 9. Space syntax model of global choice in metropolitan (top) Doha and (below) Muscat.
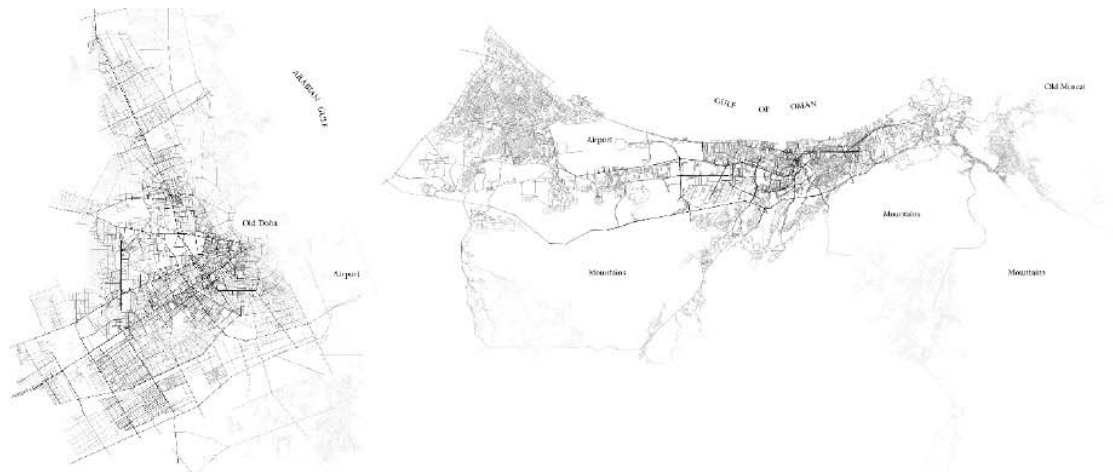
Figure 10. Space syntax model of global integration (radius=n) in metropolitan (top) Doha and (bottom) Muscat.

Figure 11. Space syntax model of integration based on mean depth from the most integrated street in metropolitan (top) Doha (radius=6) and (bottom) Muscat (radius=13).

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Borgo Taccone. From the fragment to the weave

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Abstract

The water reclamation of the twentieth century, especially between the two world wars, was characterized by the national debate around the projects of the new towns and their symbolic value as an expression of the Country's rural identity. A "town-centric" vision that the Agrarian Reform of the Fifties partially modified, directing the programs on a greater balance between the towns and the "poderi", gathered in the new "agrarian companies". In the Basilicata Region it was above all the second phase that left indelible marks in the territorial structure, having as barycenter the well-known case of Matera, which was in reality a unique experience.

The new town of Taccone, the subject of this study, was built about forty kilometers from Matera, to the northwest. Plinio Marconi's original project, concerned a territorial fulcrum and an urban-rural core of 4000 inhabitants as a support of the poderi, that was only partially realized, causing a fragmentary tissue currently abandoned. His recovery project has involved a Degree final thesis of the Architectural School of the University of Basilicata, followed by the author as a co-supervisor.[1] A didactic experience aimed of developing a recovery project starting from the pre-existences, within a general morphological rearrangement consistent both with the current needs of reviving the new town as a new polycentric rural nucleus, and with the actual international debate on the theme.

The purpose of this study is to provide a general contribution, starting from the application case, on the recovery of the abandoned New Towns, based on an interscalar strategy attempting to critically summarize the problematic link between Pre-existence and New.

Introduction

Among the issues concerning the Integral reclamation between the two world wars, the problematic intersection between the drainage of the marshes and the rational planning of "new" lands, culminating in the symbols of the podere[2] and the New Town, has always prompted an architectural debate focused above all on the iconic value of the town, the fulcrum of the "rural population". Subsequently,

the post-war Agrarian Reform updated its principles, subtracting the town-centric propaganda of the first phase, to searching a dialogical strategy in which new towns were considered as a variation of the planned structure of podere.

These are two distinct but related phases, overlapped in the span of about twenty years in a not linear way: Integral reclamation of the thirties, made by the National Opera for Combatants and by Consortia for reclamation and the land transformation, and the second, concerning the Agrarian Reform of the fifties. Born within different social, economic and above all political scenarios, they are united by the imposing program of land subdivision focused on the "rural urbanization". The first is a summary of the post-unification State dispositions,[3] not realized largely, especially concerning the spread of sparse rural houses,[4] while the second recovers the design syncretism of the Integral reclamation connecting the different scales of the agricultural space, from the podere to the new town,[5] however updating it with the introduction of a new conception of rural settlement unit, the "agrarian company", which brings together all the anthropic elements, providing them with a hierarchical and spatial fulcrum. Two different programs that profoundly changed the Italian agricultural landscape.[6]

In Lucania it is above all the Agrarian Reform to have traced the "settlement coordinates" of the contemporary rural landscape. Matera, in this sense, is the most important case affected by the works of the "Reclamation District" of Puglia, Lucania and Molise, becoming a theoretical laboratory under the well-known political and cultural events that led to Ludovico Quaroni's La Martella village and to the new districts of the "Sassi Recovery Plan". Even the countryside of Irsina became a special place of agricultural colonization in the early fifties, mostly represented by the project of the Taccone new town, which was not only the State response for gather the agricultural population, but also the attempt to compose an urban-agrarian weave rationally summarized by the routes, both historical and planned, and the railway, that is the real matrix axes of the modern reclamations. Therefore, paths and routes were consubstantial to the urban-agrarian tissue that, with different functional variations, could made the close relationship between Living and Working legible and spatially perceptible.

Plinio Marconi's project of Taccone new town, only partially realized, survives today as an unfinished fragment, abandoned for several years. The project presented pursues the aim of reconciling the rebirth program promoted by the local administration with the primary need to provide the current unfinished urban form with a possible morphological significance to give an overall sense to the exsisting fragments, both as a settlement and as a structure that critically specifies its relations with the countryside, symbiotic but at the same time dichotomous. The general aim was not to solve all the complexities, but to contribute to update the intervention strategies for abandoned New Towns of water reclamation, as an opportunity to reflect on the immense settlement heritage inherited from the urban-rural policies of the twentieth century.

The "ruralist" strategies of "Integral reclamation" in Agrarian Reform

The link between reclamation and project in the first half of the twentieth century unfolded within a national vision in which the drying up of the marshes had to combine ruralization with demographic redistribution, through two different phases overlapped: the well-known "Integral reclamation" and the post-war Agrarian Reform. These are phases with multiple points of contact, especially in the South of Italy.

The "Integral reclamation", as is known, promoted agricultural and maritime development as an antidote against "destructive" industrial urbanism, then codified in the Royal Decree of 1933, who prompted the debate on updating rural architecture, focused on the practical reasons as an aesthetic-constructive principle.[7]

It is important to underline that the projects for the New Towns of the early twentieth century generally don't express a specific urban-rural morphology nor do they show the search for special relationships with the spaces of nature along their edges, despite their're focal points of the land subdivisions. Perhaps among the reasons there was both the need to avoid the disorientation of the settlers, who in the New Towns had to find the "memory" of the cities who came from, and the importance to reduce the variants of the replicable models, adapted to different geographical contexts without expensive variations. There was probably a (desired?) lack of interest in updating the design approach and language, with respect to the novel challenges introduced by the relationship between the New Towns and the landscape.[8] An occasion exploited by the Anglo-Saxon cultural areas through the "garden city" conception, affirmed in the Italian reclamation projects only after the Second World War. Instead in Italy attention was focused on defining a combinatorial method in which the reclamation embankments -at the same time agrarian paths or urban roads- interacted simultaneously with the series of lots adapted as poderi or building areas, and finally with the overall strategy uniting the podere tissue and the built tissue of the new agrarian settlements. It's a list of possible variations of a constant principle founded on the serial repetition of models, on which are based what Piccinato stated as "not cities but agricultural municipal centers at the service of reclamation". On them converged the research of Italian Modernity and the metaphysical suggestions of public spaces and squares.

The Agrarian Reform searched more emphasis on the relationship between New Town, podere and farmhouse, no longer as distinct entities, but a structure of widespread housing-agrarian nucleous combining the planned rural landscape with domestic architecture. In fact, the Program of the New Town and rural Service Centers foreseen in the "Reform district" of 1953, has several variants of the combination countryside - inhabited area, classifying the types of settlement and buildings according to the size of the podere and the number of family members recipiented. Three models of Service Centers are described in the official documents, differentiated by size and included functions, designed by the Authority as "satellites of New Towns or existing cities".

In the Fifties, the settlement development of the "new lands" is distinguished by a syncretic and inter-scalar method, through models and variants that in a few decades definitively changed the morphological structure and perception of many rural areas of Italy, shifting the focal point of the design, compared to the previous experience of the Thirties, from the New Town as a "centripetal node" of the territory, to the agrarian-settlement as an inter-scalar weave comprising the town and the podere, critically combining models and formal references of the Integral reclamation with the international debate on post-war reconstruction, in an attempt to find a new relationship with history within the changed international cultural scenario.

In this context, Neorealism represents the "physical and spiritual measure"[9] expressed by mean a synthesis in which coexist different cultural contributions: the themes of the APAO of Bruno Zevi, the northern European rural villages that rework the principles of the Garden city, and the linguistic simplification as a reflection of popular roots with a renewed attention to spontaneous architecture.[10]

The projects of the Agrarian Reform born in this complex cultural context, with two distinct attitudes: the first is linked to a sort of "continuist" line, which updates the typological and linguistic principles applied to the villages of the Thirties; the other is inspired by the rich post-war debate mentioned above, experimenting with new spatial, typological and linguistic solutions.[11] In this second case, the attempt was to redefine the relationship between the urban tissue and the podere, abandoning the rigid serialism of many New Towns of the Thirties, to experiment with spaces of relationship in which the countryside "intersects" squares, parvises, gardens of the farmhouses, through misalignments and angular divergences that penetrate the building tissue and the agricultural lands. As far typological innovations, the intent was to update the division by functional areas of the farmhouses with the introduction of the "rural annexes", detached from them as new perceptive references, as intermediate elements between the house and the podere which added a further rhythm in series to the Cartesian sequence of cultivated lots. Fi-

nally there is the question of language, poised between monumental forcing, vernacular temptations[12] and the "dogmatic functionalism of the machine house"[13]. In between, the disciplinary broadening during the post-war reconstruction, which had a significant influence on the design of the new rural centers and on the increasingly widespread use of prefabrication.

Borgata Taccone. From "Agrarian Reform" to abandonment

Designed in 1952 by Plinio Marconi,[14] Borgata Taccone is a New Town for 4000 inhabitants, 15 kilometers away from Irsina and Genzano di Lucania, and with a radius of influence of 5 kilometers in the countryside. It was founded in an area that satisfied three preliminary conditions: the proximity of the railway, a consolidated road network and a soil morphology suitable for being divided into a regular series of cultivated lots. The New Town, in this sense, represented another node in the thousand-year-old network of paths that crosses Lucania transversely, connecting the Tyrrhenian coast to the Ionian and the Adriatic coast, and equidistant between the Regio tratturo and the Via Appia, along one of the transhumance paths that reaches Bari from Appennine. A structure completed by the pre-existing sheep tracks, introjected by Plinio Marconi as a "nervous" system connecting the different "poderi clods"[15] with the lots and the relative paths, oriented and arranged according to the slopes of the ground. The design references are related to the dominant research themes of those years, such as the settlement schemes characterized by fabrics of terraced "residential poderi ", with farmhouses located on the paths borders and converging towards the Civic Center, or the sinuous profile of the roads, only partially justified by the orography, often adopted as a formal strategy for the "ruralization" of the New Town, showing affinities with the famous case of the La Martella new town at Matera designed two years later.

These themes characterize Borgata Taccone, whose layout is divided into four areas: the farmhouses with gardens; the Social Center with the church, the square, the school and other public buildings; the area of agricultural facilities; the station.[16] Parts linked together by the paths, which make visible the connection between the urban tissue and the agrarian context. The station is an urban gate that links the railway and the territorial route with the agrarian facilities area and the Social Center. The latter is the centripetal nucleus of the settlement, located following the slopes of the ground.

The models chosen for dwellings have variable dimensions according to the number of people, to the different spatial organization, to the more or less close relationship with the podere determined by a specific setting of the volumes. The A type semi-detached house, for two people, includes a rectangular module mirrored on the long side, recalling the quadripartite modularity of the typical Apennine rural farmhouse. B Type, for four people, has a double surface in comparison to the previous one and, also in this case, the module is mirrored along the path. The "subtracting" of the facade angle marks the access and the common external space between the two lodgings. In the C Type, also semi-detached for four people, inclined entrances interrupt the orthogonal geometry of the system and mark the semi-private space in front of the roads. Two other models, D and E, completed the original project, adapting and reassembling the several spatial modules described above.

The farmhouses are united togheter by the farmyards in front, that separate but at the same time link the path with the living space, combining the two social areas of the town, the collective one of the public space and the private one of the cultivated land. A kind of extension of the podere with a specific urban vocation, delimited by the building, the porch for agricultural tools and the "annexes" (stables, ovens, fountains, pigsties). A combinatorial system composes the different volumes and is completed, in the rear part towards the countryside, by small storages for fertilizers and silos which, despite their scarce architectural importance, dialogue with the double rhythm that visually connotes the podere tissue and its subdivisions.

The residential tissue is therefore founded on the repetition of the elementary settlement module of farmyard-house-podere, doubled in depth in relation to the central path of the new town. In this sense, the "periurban" border represents the gradual transition

from the house to the agricultural lots of the "podere clods". A tissue having the Social Center as a compositional center of gravity, organized mainly by the school, the church, the shop-post building and the garage. Their nodal position generates open spaces connecting with the countryside, bordered by the path that connects the village to the station, read as the urban-rural gate of the town. The bell tower is located in the middle of the parvis, toward the countryside. A symbolic element and an inter-scalar landmark.

The building technic reflects the "rational economy" as a general concept of the Agrarian Reform, which re-elaborates the "aesthetics of needs" stated by Pagano through the use of mixed structures in limestone and tuff for the walls and brick-concrete for floors, roofs and stairs, as well as for the load-bearing structure of the main public buildings. Purposely rudimentary choices that in those years combined economic sustainability with the possibility of using unskilled labor. The architectural language synthesizes the local building culture, the Neo-realist themes and the Rudofskyan spontaneity, in the case under consideration translated in primary solids with pitched roofs, completed by the smooth plaster painted white and by the tectonic knots covered by limestone slabs. Doors and windows are differentiated according to the purpose of the rooms and the need to make the urban gates and main entrances of public buildings legible. As in other similar projects, the porticoes are the structure of connection and hierarchical emphasis of the public space, visually focusing the several buildings towards the church.

In this sense, Marconi states in the report to the project, that the "expressive means are therefore based on simple masses combination and on plastic elements strictly modelled about the organic function of the buildings and their individual parts".[17]

The project described so far, which found morphological and expressive fulfillment in the mutual hierarchical balance among the parts, the residential one, the collective one and the productive one, was scaled down by the State company "Cassa per il Mezzogiorno", reducing the residential part, building only the lots on the "central spine" path. Furthermore, changes were made to public buildings and houses in particular, removing the models A, D and E, and reviewing the spatial organization to ensure greater relation with the countryside. But the revision of the urban layout compromised the syntactic structure of the project and the visual landmarks. In reality, the realized part was the initial one of a program to be increased in successive stages, providing for extensions that, as in many other cases of the Agrarian Reform, never occurred due to the overall oversizing of the programs.

From the fragment to the urban-agrarian weave. A re-design experience

The effects of the progressive abandonment of the town are amplified by the incompleteness of its structure. An "unfinished" piece of new town with disarticulations, gaps, lack of perceptual counterpoints with landscape. This is the initial framework of the Final degree project, which sought to respond to the requests of the community of Irsina, aimed at the rebirth of the "borgata" and its strengthening as an agricultural pole, interpreting those needs within the current architectural debate on the theme.

The first aim was to tie the fragments in a weave that, by incorporating the existing tissue, provided it with a never-reached unity as a whole, through some preliminary objectives: the clarification of the forma urbis and its relationship with the poderi, by underlining the agrarian-settlement border; the updating of collective and productive spaces; finally, a greater clarity of the relations among the paths and the spatial articulation of the town. The three objectives have in common the re-design of the settlement structure, a "re-founding" exercise that introjects the pre-existences and reorganizes them, emphasizing the different geometric orientation of the fabric in correspondence of the Social Center. A discontinuity that divides the town in two parts, summarized by two urban "clods" perfectly coherent with the podere "clods" of the Agrarian Reform composing the rural context. "Clods" represent variations of the same agrarian-settlement design strategy going through the entire experience of the New Towns, from the podere to the house. In this way, the presented project has tried to define a new dialogue with the agricultural landscape, not as a mimesis, but designing a clear architectural distinction between town and poderi, starting from the same morphogenetic principles.

First of all, a special role for the main existing routes has been recognized: the matrix one of the inhabited area, broken at the intersection with the Social Center, and the border road village-countryside, whose position has been strengthened by prolonging it as an axis that cuts the building tissue diagonally, converging towards the matrix path. These paths join the two agrarian-settlement "clods". The northern "clod", consisting of an urban fence centrally crossed by the "backbone" path, articulates the existing and new houses[18] and reaches the collective garden with the large water tank, that is the visual node of the village and a landmark counterbalancing the religious landmark of the bell tower. Instead the southern "clod" encloses the main public buildings and collective spaces, modified to tie the current episodic fragments within a new enclosure composed of the shop-houses and the retail market, which together with the existing tissue forms a kind of agro-urban "forum", open on the countryside with a cultivated park lying on the hillside. The market has a dual function, because its opposite facade faces the church, balancing its volume with respect to the churchyard open to the poderi. Finally, the Production district, an appendage to the town, redeveloped through the redesign of its perimeter with a hypostyle enclosure that holds the fruit and vegetable market, therefore linking up with one of the most important architectural and cultural archetypes in the region.

Conclusions

The project for Borgata Taccone was the occasion to explore the theme of urban regeneration as a critical exercise of re-writing, based on the search for "morphological significance" at different scales, through the reinterpretation of the Existing. In this sense, the recovery did not concern the restoration of a previous form or the urban completion never achieved, but the reaffirmation of some essential elements of its weave, reworked in the light of a design hypothesis that reinterprets the existing rural town leading it to a novel alternative unity, based on "re-founding" tools. The first one is the architectural clarification of the dichotomy city-nature, by signs-traces that explain the agricultural land morphology. The second is the updating of some typical settlement characters of the rural New Towns, such as the serial rhythm of the houses and annexes, the perceptive conflict between visual horizons and the landmarks of the silos and bell towers, the physical and spatial inter-scalar relationship among the house, village and farm, summarized in the elementary archetype of the enclosure.

The linguage of the project follows the "tectonics of the necessary", by means a synthesis through which characters of permanences are reinterpreted starting from the direct expressiveness of the rudimentary materials, combined to critically unify New and Existing, to narrate contemporarly the present condition and the language archetypes of the region.

This project, provisional in its outcomes, wants to represent only one stage of a research aimed at rethinking the Existing by recognizing in some of its archetypal principles the possibility of revealing unexpressed potentialities capable of recomposing, in the present time, the synthesis of a place and the architectural-cultural area to which it belongs. Perhaps, these are principles still necessary to express permanences in a novel way, not as an act of adherence to the past, but as a critical structure connecting the uncertainty of contemporary processes with the complexity of the stratified reality, with which they have to deal in any case.
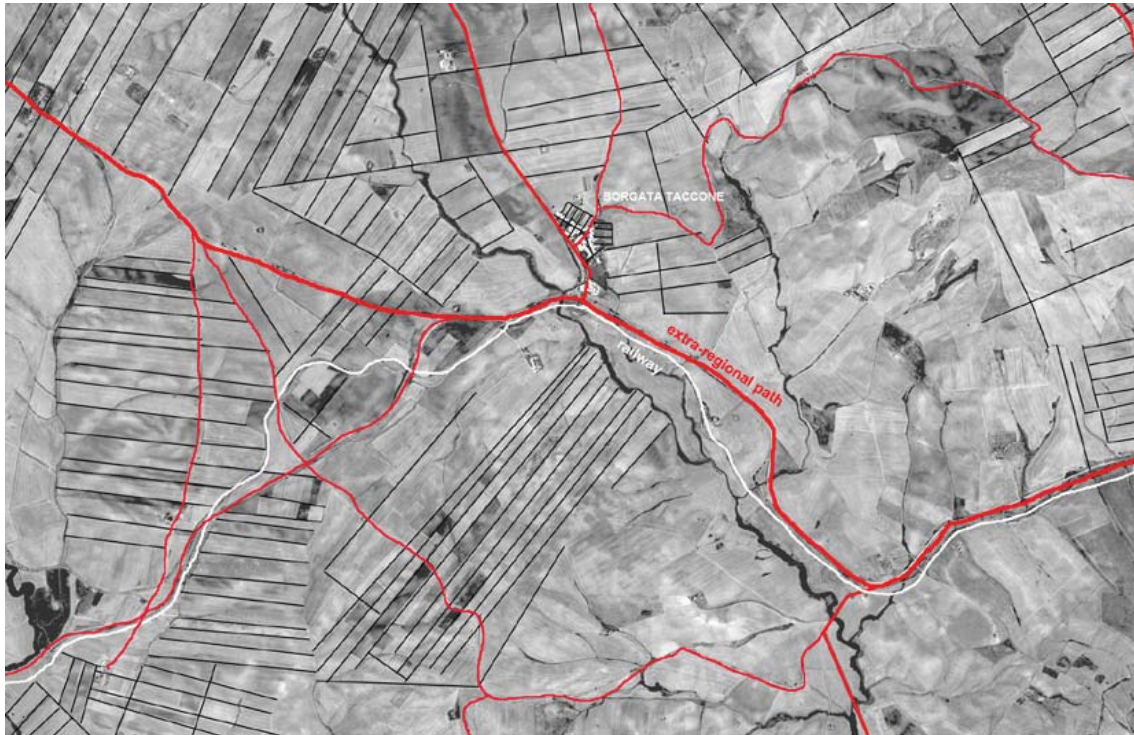
Figure 1. The agrarian-settlement weave of Borgata Taccone, in comparison with the system of Poderi.
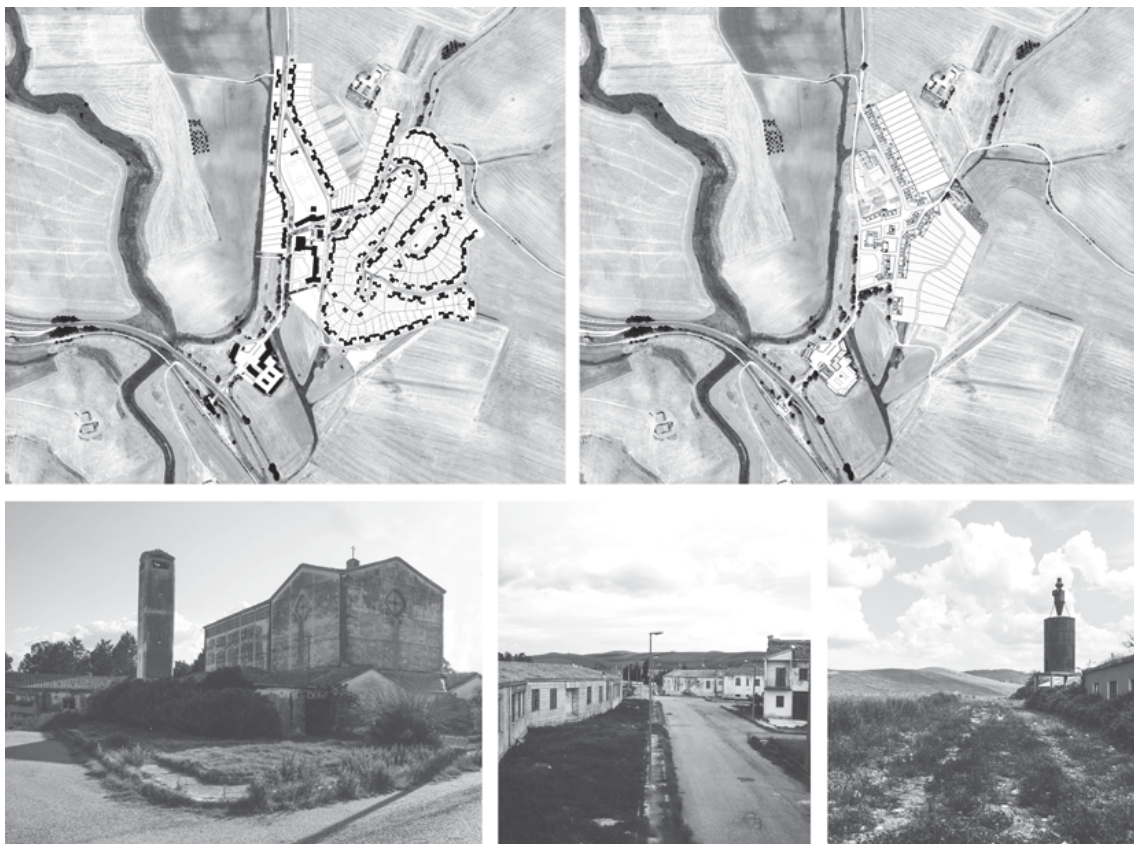
Figure 2. The final project by Plinio Marconi (on the left) and the built project (on the right). Below, starting from the left: the church in the Civic centre; the space between the school and the farmhouses; the border of contact town-countryside.
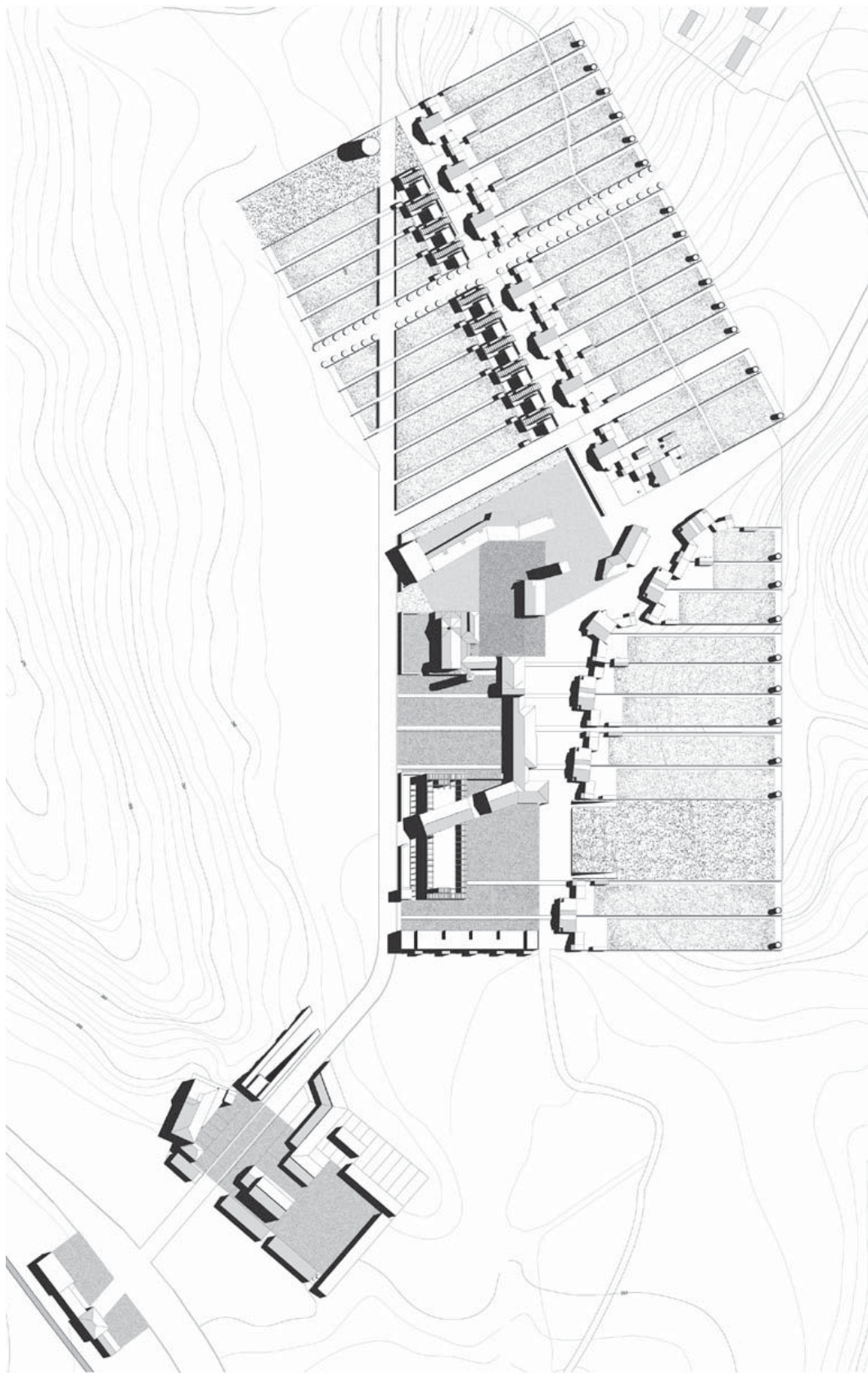
Figure 3. The re-design of Borgata Taccone, from the abandoned fragment to the new urban-agrarian weave.

ISUFitaly_2020 **URBAN SUBSTRATA** | Morphological legacies
& | and
CITY REGENERATION | design tools
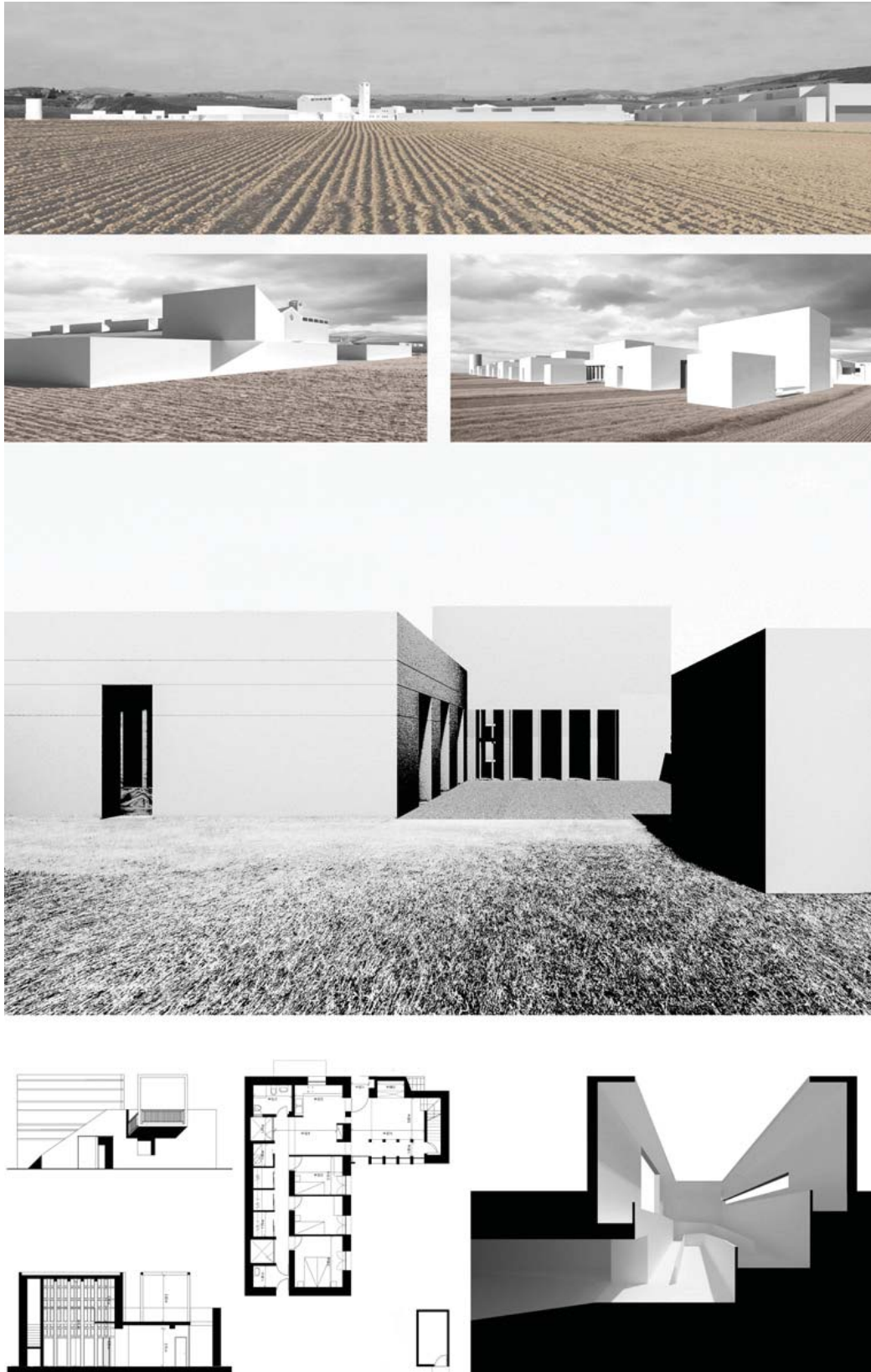
Figure 4. From above: general perspective of the re-designed borgata; the completion of the parish center with the enclosure and the new auditorium; the new border of contact town-countryside; the rear garden of a new farmhouse, directly connected with the podere; drawings of a new farmhouse; the ramp connecting the station with the Production center.

Footnotes

1Degree thesis in "Architecture and Heritage", entitled: "The rural new towns of the twentieth century. The re-design of Borgo Taccone". Supervisors: Prof. Antonella Guida (ICAR/10), Prof. Antonello Pagliuca (ICAR/10).

Co-supervisor: prof. Giuseppe Rociola (ICAR/14).

Students: Jacopo Lorusso, Giulio Pacente, Francesco Nardulli.

2With respect to the specific field of investigation, the podere (plural: poderi) is a typical portion of agricultural land at the center of the reclamation programs, obtained by a territorial subdivision after drainage and expropriation. The result is a geometrical tissue generally characterized by rectangular poderi matched in series and singlularly assigned to a family.

[3] They are: the "Baccarini Law" of 1882, the Law on Water Reclamation of 1899, the Laws of Giolitti for Calabria and Basilicata, the Plans of the Water Catchment Areas of 1917 and the Royal Decree-Law n. 753 of 1924. These dispositions, addressed to ensure the hydraulic order of the lands, prelude the settlement development clearly explained in the Royal Decree of 1933.

[4] The reason was both because the "population" was almost entirely focused on the symbolic value of the centralized new town, and because of the oversized general design compared to the workforce that could realistically satisfy the previsions of demographic and production increase. Furthermore, there was no effective operational and economic management of the reclamation.

See: E. Sereni, 1975, pp. 116-117.

[5] The rules on which the Agrarian Reform is based were all enacted in 1950. They are: the "Sila Law" n. 230, the "Legge Stralcio" n. 841 and the "Law of the Sicilian Region". The main aim was to make more effective, after unsuccessful attempts, a rural colonization capable of supporting the agricultural modernization prevented in the South by the landowners inertia organized around the farm-nuclei and a commuter and seasonal peasant population. To remedy this age-old condition, the expropriations on the one hand, and the settlement re-organization of the workers on the other, became the reforming cornerstones that transformed many rural landscapes in Italy. See: Sezione Speciale per la Riforma Fondiaria in Puglia, Lucania e Molise, 1952, pp. 21-22.

[6] A landscape that in the South, due to the age-old tradition of the latifundium and pastoral activity, was characterized by vast free areas, interrupted only by a few scattered settlement areas consisting of farms, farmhouses and agricultural storages, or polarized by some pre-existing villages, often developed starting from ancient farms or monastic complexes, as well as sanctuaries.

See: F. Mercurio, S. Russo, 1990, p. 106.

[7] It was a discussion in which the Italian Rural Architecture exhibition by Giuseppe Pagano and Guarniero Daniel of 1936 stands out, dedicated to the aesthetics of necessity as venustas of the new farmhouse. A cultural position that was confronted with Gedion's hypotheses within the CIAM and the movement born around the Rooseveltian Greenbelt Towns. The latter experience filtered in Italy also thanks to the contribution of Gustavo Giovannoni. In this sense, differences between the updating of traditional rural building in an anti-urban vision and the Corbusierian and German positions on the standardized prefabricated city was even much clearer.

Two visions reflected in the national competitions for the new agricultural towns of Agro Pontino and Sardinia, characterized by a combination of the popular approach permeated by Romanity and the "primacy of the arch" asserted by Giovannoni, and a morphology often in balance between the rereading of the classic space of the squares and the standardized seriality of the housing. In a certain way, It is the garden city that meets siedlung, without however adopting the prefabrication on a large scale, impossible in the peripheral rural areas, strongly linked to a traditional building know-how. An ambiguity present in many projects of that period.

For the detailed critical examination of those phenomena, see the notable literature.

[8] In this regard, it is interesting to compare the projects of Pontine marshes and those of Tavoliere plain with the drawings carried out by Le Corbusier in 1934 during his trip to

Rome. Of particular interest is the drawing including the comparison and observations of three different hypotheses for Littoria, Sabaudia and Pontinia. A common element among these hypotheses is the application of the concepts of La Ville Radieuse, expressed with an open composition of isolated buildings, but at the same time linked paratactically with the two orthogonal territorial axes intersecting both in the spatial center of gravity of the square. See: F. Tentori, 2006, p. 73.

[9] Evoked by Rogers, Gregotti and Stoppino, in the exhibition edited for the IX Triennale di Milano in 1951.

[10] It is also important to mention the remarkable contribution of scholars such as Sert, Coderch and Tàvora. Moreover, in those years Saverio Muratori was studying the city understood as a part of the territorial organism, whose structural processes involving simultaneously the anthropic reality in its different scales. A conception through which the building tissue in relation to the paths becomes the privileged research field to recognize and verify its "a priori" typology, up to consider the project as a phase in continuity with the process themselves.

[11] Without prejudice to the general principles on the location and classification of settlement models (centralized, semi-centralized, scattered) almost analogous to those developed in the fascist period. See: R. F. Medici, 1956, p. 29.

[12] In a sociological attempt to induce colonists in an environmental harmony capable of recalling their respective places of origin.

[13] R. F. Medici, 1956, pp. 44-45.

[14] Plinio Marconi (1893-1974) graduated in Civil Engineering in 1919 under supervision of Gustavo Giovannoni, of which he was assistant to the Application School for Engineers of Rome from 1920 to 1924. From 1921 to 1943 he was chief editor of the magazine "Architettura e arti decorative", directed by Gustavo Giovannoni and then by Marcello Piacentini. In those years he worked for the "Istituto per le case popolari" (ICP) in Rome, collaborating in the construction of the Garbatella district and the Portuense district of Rome (designers Giovannoni and Piacentini). From 1933 to 1938 he was assistant to Marcello Piacentini in the course of Urbanistic Applications of the School of Improvement in Urban Planning. From 1938 to 1950 he was appointed professor and later holder of the first chair of urban planning - after Piacentini - at the Faculty of Architecture of Rome, of which he was also headmaster from 1963 to 1968. Between the two wars Plinio Marconi participated in numerous competitions for urban plans. From 1952 he was director of the Institute of urban planning and then of Urbanological and Technical Research of the University of Rome. After the Second World War, among the projects carried out, there were several rural villages in Puglia, Lucania and Molise. Morevover he designed public housing districts for INA-Casa, such as Torre Spaccata in Rome, in 1958. He was a prominent member of the INU. See: P. Gabellini, 1992, pp. 97-152.

[15] The concept of "farm clod" reinterprets the "urban clod" theorized by Franco Purini, extending its meaning to adapt its principles at a part of agricultural land, morphologically delimited and functionally autonomous, in which the residential and production structures are intimately interrelated, representing the everything in a little part of it. In the projects of the Agrarian Reform, the result of this morpho-functional syncretism is an agrarian-settlement system (at the base of the different models developed for the "Comprensori" -regional areas- of the reclamation) recognizable and relatively autonomous with respect to the surrounding territory, also characterized by the organic correspondence between podere, home, paths and drains. The "farm clod", in this sense, is the critical intersection between preexistence and project, expressed by the weave as a synthetic structure of the rural populating. See: G. Rociola, 2016, pp. 63-64.

[16] The residential area comprises four models of farmhouse, A, B, C, D. The Social Center instead included school, garage, church, film theater, shop, post office and clinic. Finally, the production support area was composed of a large outdoor area divided by the carpentry shop, the market, the colonization offices and the silos.

[17] Source: State Archive of Bari. Inventario 104/29 ERSAP - Servizio Lavori, Ufficio Progettazione Edile: Borgate.

[18] The new farmhouses complete the building tissue along the "backbone" road.

They are designed to temporarily host small groups of agronomic researchers and are related directly to the workers' farmhouses. The rear garden continues ideally within the double-height room that represents the heart of the house, with a small library-office and the staircase leading to the roof with pergola, which can be used for drying seeds and crops.

Caption*
* All drawings are based on the work of the degree thesis, modified by the author.

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Servizio piani e progetti.

Programma delle borgate e centri di servizio rurali previsti nel Comprensorio della Riforma.

(State Archive of Bari - Sezione speciale Riforma Fondiaria, Servizio lavori, b. 121, f. 3)

The curvilinear substrate.
From the phenomenon of dequantification to deformation of the type.

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Keywords: *Substrate, urban morphology, deformation*

Abstract

What is the "deformation of the form" (Borie et al. 2008)? And what is the role of deformation in the relationship between the new building and the context in which it fits? The study of the city is the study of the urban form through the reading of the hierarchy of the paths, the fabrics and the characters of the buildings, which make up the grammar of the form, in a process intended as a succession of successive systems of structures over time (Caniggia 1963). At each stage of the training process, these structures are themselves systems of lying "urban forms" that influence the subsequent ones, deforming the building through a resilient substrate (Strappa 2016). The theme of deformation and adaptation to the previous one are analyzed in this study through the urban action of the dequantification of the special building: the stadiums, theaters and Roman amphitheatres have become the resistant sediment that influenced the formation of the new fabric. The deformation of the type and the variants that are formed on - and inside - these curvilinear buildings over time find in Kandinsky and Klee's studies on circular form and its relationship with the linear one a new term for comparison and confirmation of morphological studies on form urban and on the role of the substratum as an element not only of "resistance" but of interpretation and transmission of form.

Introduzione
De Substratis
The contribution presented takes its cue from the doctoral thesis I discussed in the same days of this conference, and which has as its object of research the substrate in its theoretical and design meanings necessary for the formation of the city. Any research on the city cannot escape from being a research on form and specifically on urban morphology. Goethe in 1796 used the term morphology not only to indicate the discipline of form but also as an analysis of the process of formation of organisms; stating that morphological studies describe complex organisms without presenting the various parts broken down analytically but always grasping the whole as a real being and a unit in constant evolution (Goethe 1842). The study of the physical form of the city always preserves the sense of a dynamic of processuality that through an "organic hierarchy of forms" (Muratori 1963) it is possible to identify in an operating history. The history of the city is the history of the form and the processes of transformation that involve its parts without ever losing the general vision, the role of urban organism to which the city tends both spontaneously and intentionally.

The object of the research is the urban forms of substratum which, influenced by "what was underneath", welcomed the transformations of constructed reality, becoming not only a container of material and immaterial memories but catalytic forms of urban processes. The forms of the building in question are those of the ancient Roman ludic-scenic buildings and their role in the training process of the city: from special building to ruin through a de-quantification, a consumption of their shape, up to becoming an active part of the urban fabric maintaining a recognizability deriving from the formal and material characteristics of the substrate on which they were "formed". These formal characteristics are identified in the geometric figure of the curve whose study allows to combine morphological studies with those of the figurative arts of the twentieth century.

De-quantification and deformation in substrate architecture
On the question of "what it is" and "where it comes from" the form has debated so long not only in architecture but in all knowledge that it has a representation in reality - and not - that could only lead to confusion even a simple hint to the theme and this research does not try to suggest a new interpretation or definition, but the adhesion to the concept of the Muratorian school - dealing with morphology - of form as transmission in the physical reality of the characters of a structure (Strappa 1995) is transparently enunciated. assuming that "the term" structure "is used in its general meaning of law of relationship which includes both the sense of structure of elements, as of system of structures and of organism" (Strappa 1963). The shape is the object of research in its permanent character but not as a static and imperishable sign but in its changing and influencing subsequent forms while maintaining recognizable some of its characteristics that are inherited and interpreted by the new building.

By systematizing the issues set out and identifying the common denominator that underlies the theoretical research exposed, the operating concept of form of Sub-stratum obsessively recurs.

In the philosophical sphere, the term substratum appears for the first time in Greece in Aristotelian metaphysics, sometimes with reference to matter with respect to form, sometimes with substance - sub-stale - with respect to accidents, sometimes with logical subject - sub-iectum - with respect to predicates .

It is Matter because it is a sub-stratum of the potential of reality, that is pure possibility: matter / substrate is not a static element, but has a creative potential linked to its shape and its characteristics as Signed Matter. To mark it is the time to which it is platonically subject; it changes continuously referring to forms other than those of origin, in which the sign, the initial trace emerges more or less explicitly. The substratum is thus "what lies underneath" - sub-under and stratum-stratum - and which collects the legacy of a topos and a cultural area in every sense, from philosophy to linguistics, from geology to urban morphology.

It welcomes and stimulates the transformations of reality, matter and form in this field

of research, through a processuality addressed by its characteristics, the product of a historical stratification, which catalyze the phenomena by re-emerging through them.

Starting from the concept that urban forms can be grouped into two large inter-dependent systems (basic construction or residential construction and special construction such as monuments and non-residential but "service" construction) it is clear that the concept the de-quantification closes the circle of the city's training process: if it is normally associated in the Italian typological-procedural school that from the housing unit comes by recasting to the special building that inherits and welcomes its characters, the de-quantify is the inverse and complementary process.

The special ancient building for shows, in particular the amphitheater, is the last product of the Roman construction typology and it is not possible, as for many ancient structures, to start from a "process of intentionality", specific to special construction, but with typological characteristics of these special organisms, by their relationship with the urban fabric and with the routes. The theater, the odeon, amphitheatres and stadiums presented in themselves the characteristics of the architectural unity defined by the Vitruvian ratio: the ratio utilitas, the firmitas and the venustatis. These in Roman constructions are inseparable and interpenetrated and the excessive strengthening of one component compared to the others is always indicative of a crisis situation. Therefore if we analyze these organisms through the reconstruction of the pre-operational concepts that underlie the anthropic construction of the different special buildings over time; concepts that are unitary and synthetic of all the essential components to structure in an exhaustive way the object implemented by man, then it will be possible to recognize the characteristics of minor, serial and rhythmic building, which formed and then allowed the de-specialization, or the de-quantification of the special structure transforming it into a substrate for subsequent fabric developments. Referring to the Vitruvian triad it is therefore possible to clarify the formal and educational characteristics of these special buildings object of the study:

Utilitas

The intended use, functional utility, is the primary factor that determines and justifies the shape of the buildings for recreational-scenic purposes. The theater and the odeon intended for representative and musical performances always present the element of the large auditorium, identifiable with the geometric figure of the curve, opposed to the linearity of the scene. The difference between the two elementary geometric matrices depends on the two distinct functions they welcome: that of the spectator and that of the actor-musician - important is the space of the orchestra which will be the subject of interesting urban phenomena of occupation and not of consumption of the material-forma -– "The geometry of the Roman theaters consisted of four triangles or three squares inscribed in a circumference which give rise to twelve vertices from which the stairs of the auditorium, the margins of the orchestra, the stage and the accesses relevant to the scenic building. The upper vertices define the stairs of the cavea which enclose the wedges into which the steps are divided. When you get to the diazoma, the stairs and the wedges formed by them double because of the widening of the cavea "(Vitruvius cf.). The function of the theatrical performance gives way to equestrian and gymnastic competitions in the stadium that determine a substantial change in shape and size: the sides that connect the curved element to the scene stretch to follow the internal track traveled by athletes or animals. The scene gives way as in the case of the Circus Maximus to the prisoners, that is, today's boxes for the stopping and the departure of the racing horses. This typology presents one of the closest and most evident relationships between function and form which materializes when the theater "comes out" of its plastic envelope to contribute to the shape of the city.

Firmitas

"The materials and the related construction techniques are the specific culture that a civil area applies in the construction of buildings: both are typical elements - variable in a diachronic and diatopic manner - and, together, they represent the concept

of building or the synthesis of prior to all the characteristics of the concept itself as a mental prefiguration prior to the production of the organism "(Maffei 2011) furthermore" material, matrix, matter, motherhood are articulations of the Sanskrit root "mat" which means measuring with the hand, building, that is in the case of architecture, material and construction are not the means for each other but an inseparable unity and the dissolution of the stability of the material is the dissolution of the constructiveness of architecture "(Gregotti 1985).

Venustas

Leaving aside the decorative theme of the surface and of the orders which has no morphological repercussions in the de-quantification and reuse of the artefact, it is necessary to dwell on the shape of the organism and its hierarchization. The aesthetic beauty of an artistic work and architecture was recognizable by Vitruvius in its proportions, in that harmonious relationship between the parts. Parts that in mature theaters and amphitheatres are characterized by seriality, modularity and rhythmicity. The same elements recognizable in minor or basic construction. Taking the amphitheater as an example, the characteristics of a basic building fabric are immediately recognizable both in terms of plan and facade: the monumental staircase allows you to compare only one of these buildings with an entire block. It is evident that the element of repetition is among the cardinal themes of the fortune of these urban forms over time and allows to systematise the characteristics expressed above: "architecture is the art of repetition" Purini stated in Composing architecture arguing that the use of serial elements transforms the "expressive factor" of the architectural work. The repeating and repeated element thus constitutes a part of a unitary system and does not present an autonomous character and therefore "the individuality of a component part must subordinate itself to the whole, that is, to the individuality of the whole" (Purini 2011).

In the case of the Arles amphitheater, it is clear how these structures are potentially predisposed to transformation and functional variation over time. Their venustas lies precisely in this seriality of the wall structures, then explained on the façade, which over time will welcome and measure new constructions that will consume and sediment the shape that will become substratum.

By de-quantification is therefore meant bringing back to a situation of plurality a unit quantity derived from a formative or compositional process that started precisely from this plurality.

But these de-quantified urban forms do not always have the same shape even though they start from the same substratum, that is, the type: deformations are present in the sedimentation of the forms. In Forma y Deformaciòn Borie, Micheloni, Pinon introduce the theme of through two large families of architectural and urban forms starting from the thought of P. J. Grillo and L. Hilberseimer: geometric shapes and organic shapes. In both there is a substrate. In the former, the form derives from a system of imposed relationships defined by relationships, in the latter from an adaptation to the natural context. Deformed forms are therefore transitional forms between these two categories. In fact, the terraced houses that rise between and on the ruins of Roman curvilinear structures differ not in their being partly organic forms but in that system of relationships belonging to the cultural area in which they are found: the material the construction techniques and the typology. Deformation is also dealt with in the same book through the theme of "deviation" and "derivation" following an obstacle. The issue of the obstacle is also addressed by Gianfranco Caniggia in his research on medieval fabrics, stating that in order to read the medieval city and our historic centers, it is therefore necessary to dwell on the peculiarity of the non-straight paths and the act of traveling. Man by nature conforms his path through two needs: brevity and continuity, which are peculiar characteristics of the straight path. Whenever we come across a path that does not have a rectilinear dimension, we are faced with an obstacle that man has overcome, while maintaining the continuity factor. In fact, Caniggia states that "a path therefore tends to take place according to the straight segment joining the start and finish, provided that there are no obstacles interposed" (Caniggia 1974) since by nature we do not change

the straightness with a broken line of straight segments but through a trend curvilinear in which the position of the obstacle is normally recognizable by a flex. We must not think that every obstacle is an architectural pre-existence but as is obvious also the natural reliefs represent obstacles to overcome and evolutionary factors of the form such as the placement of an angular defensive tower or the growth of a church contribute to the formation of inflections and therefore deformation.

Type and Curve

There is an inseparable relationship between type and shape: the type depends on the shape and the shape depends on the type. If the type is deformed there is a deformation of the shape. In the case of curvilinear structures the type assumes an adaptive character without losing its characteristics of Firmitas, Venustas and Utilitas. These characterize not only its structure but also its phenomenological aspect in reality. To understand the relationship between type and curve it is necessary to start from the elementary form: the line. The line in its rectilinearity is infinite and the elements that stick to it are rhythmic and repetitive. The curve is a deformed line but has a strength in the shape / type relationship when it closes on itself: while the linear segment closing in a polygon loses the perfect repeatability of the elements that stick to it (or that form it) having to solve the problem of the "corner solution". The curve closing in the perfect shape of the circle, or even the deformed one of the ellipse, perfectly retains its type and the dimensional module of its structure: the Roman amphitheatres with their radial structure present identical modules for spatial characteristics and construction elements. So the curve is more resistant as a geometric shape because it has a parent force of no change, of assiduous rhythmic repeatability: the curve is deformation but does not deform the characteristics of the elements that give life to its limit, as opposed to the straight line.

Conclusions

The curve is therefore a geometric form of substrate very strong compared to others. It manages to be a catalyst for urban transformations and a hinge between other geometric forms that is less resistant for organizing building fabrics. In architecture and urban morphology nobody emphasized the role of the curve until the twentieth century. There was always talk of type in a distributive and non-formal sense. The German Bauhaus school inaugurated a very happy season on the study of geometric shapes through the figures of Paul Klee and Kandinsky. From their works, attention is paid to the geometry that underlies and generates the forms. The curve, and the circle in particular, are the subject of unpublished considerations that can be applied to urban morphology. The urban fabric insists on a surface, on a zero plane, which for Kandinsky is the circle, and therefore by primitive analogy, also the curve: comparing the straight line and the curve it states that "the internal difference with the straight line is given by the number and type of tensions: the straight line has two clear primitive tensions, which in the curve represent a secondary part - the main tension of the curve is in the arc [...]. The penetrating element of the corner disappears, but in the curve there is an even greater force which, although being less aggressive, conceals in itself a greater resistance. In the corner there is something thoughtlessly youthful, in the curve a mature energy, rightly aware of itself "(Kandinsky 2017). Thus it emerges that the substrate has an infinite variety of shapes but that the curvilinear ones have a greater resistance, they become enclosures for city events. Their limit is often the limit of the city itself. The curve follows the pace of man.
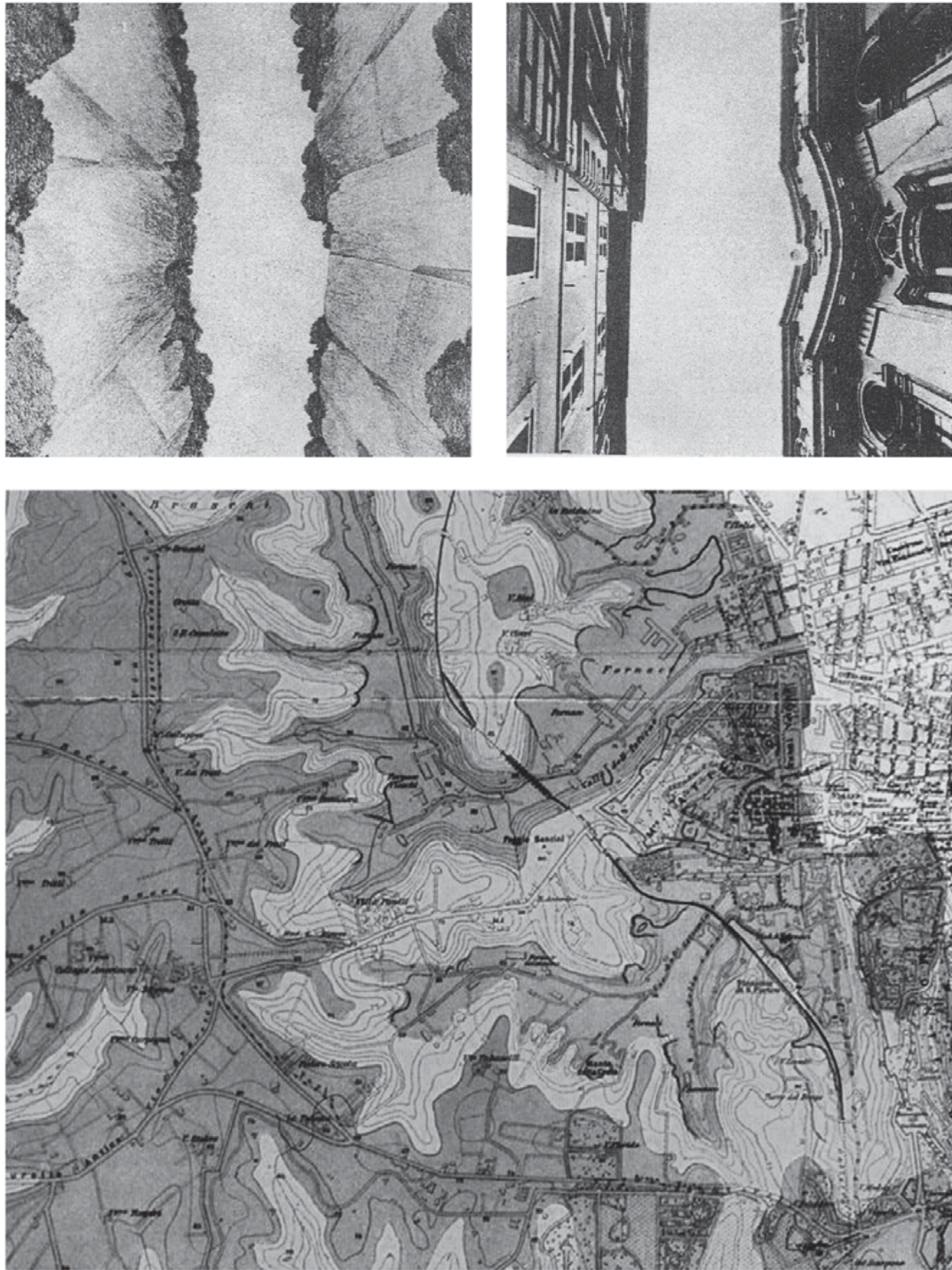
Figure 1. The natural and geological Roman substratum that defined the shape of the city (Paolo Portoghesi in Rome Interrupted 1971).
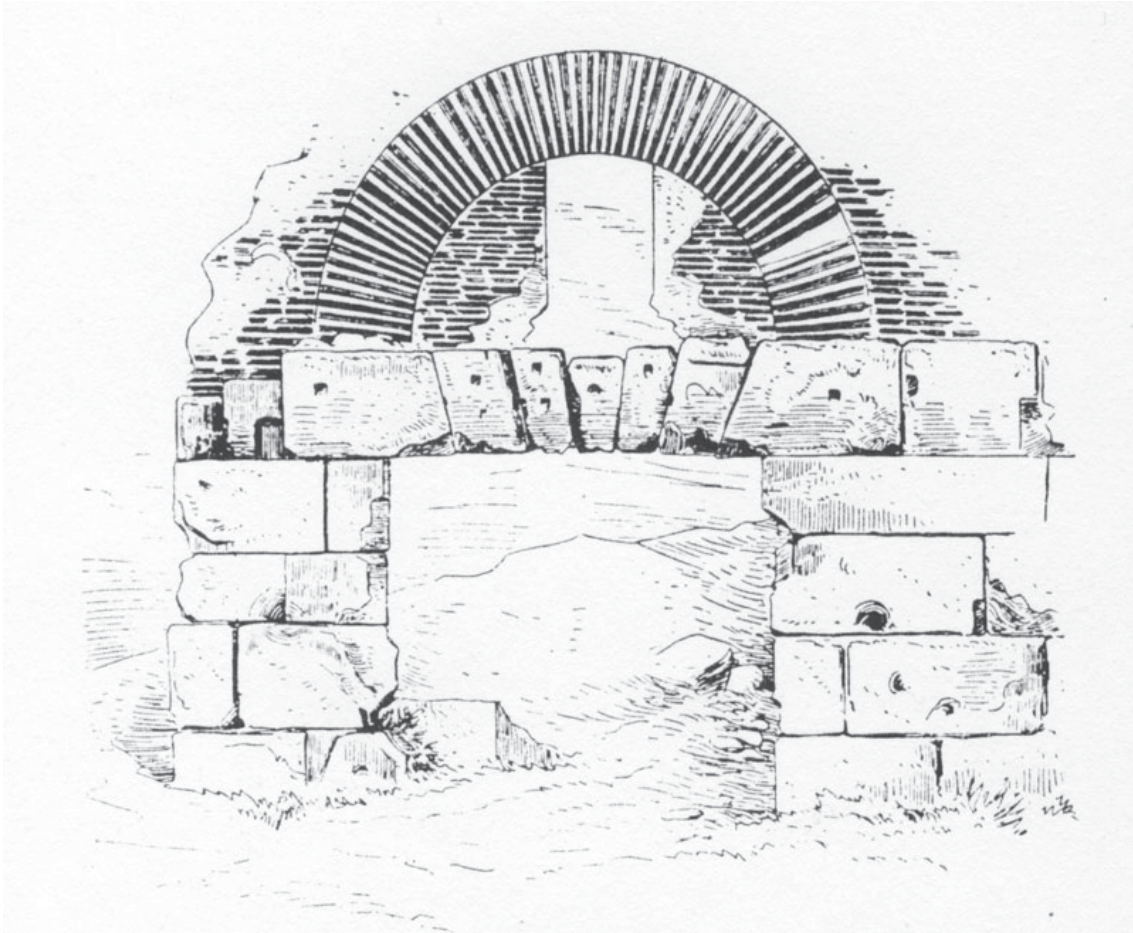
Figure 2. The arch, the curve, as an element resistant to any scale of the construction and shape of the city.

La città di Arles contenuta ne Les Arènes nel medioevo

Figure 3. Drawing by Carlo Aymonino for the cover of the "Meaning of the cities".
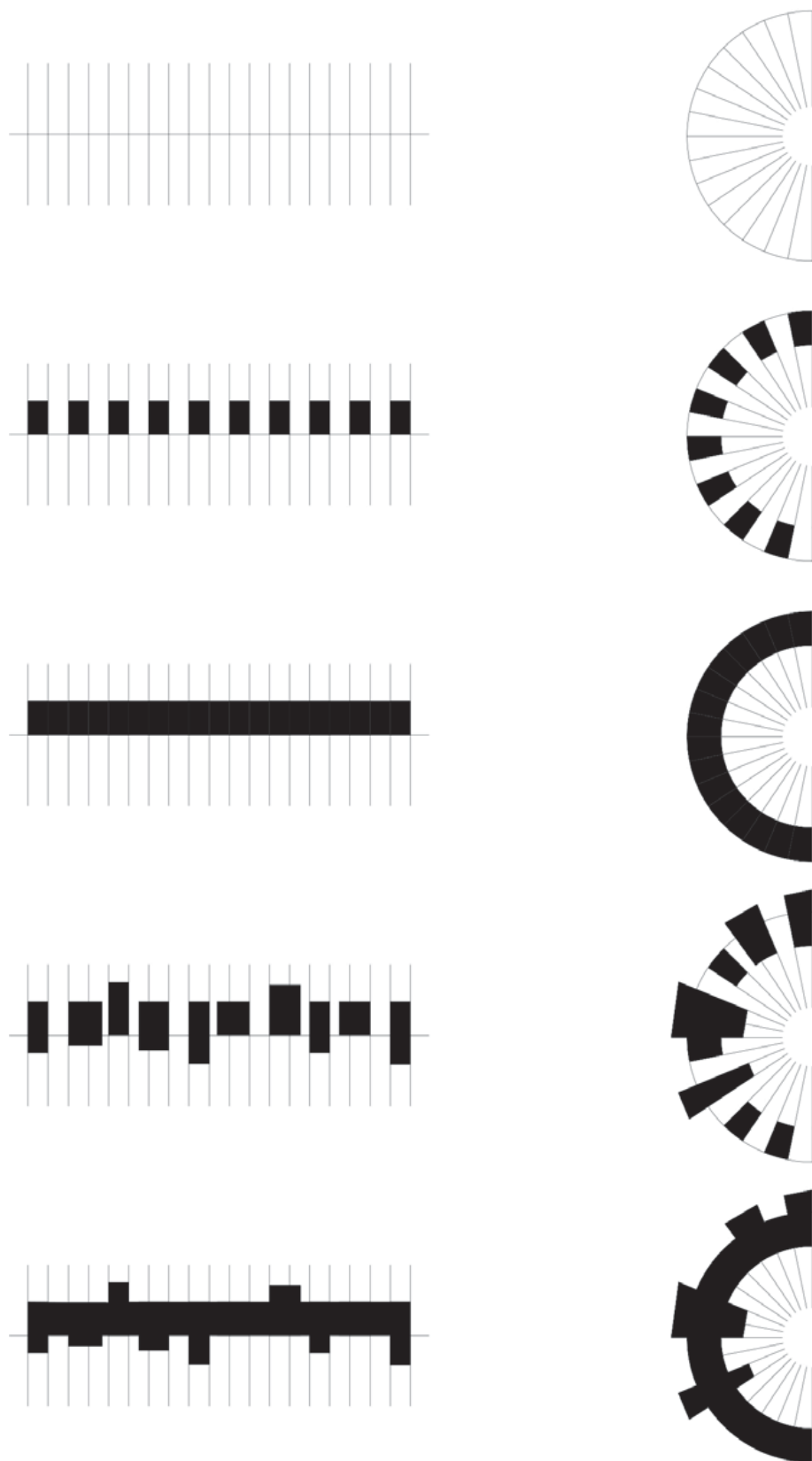
Figure 4. Interpretation by the author of the morphological relationship between line and curve.

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Ancient planned structures in Lake Bracciano area

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Keywords: *Lake Bracciano, Roman planned system, Forma quadrata Italiae theory*

Abstract

The contribution presents the first results of some topographical studies conducted on the territory of Lake Bracciano, located north of Rome and historically linked to the fate of the City. The typological reading method created by Muratorian school has been applied in order to reconstruct the salient phases of the anthropization process of the region. The territorial planned system designed by the Romans will be read, for the first time, through the application of the Forma quadrata Italiae theory developed by Giancarlo Cataldi. During the Roman period, the area was administered by the city of Forum Clodii and connected to Rome through the Clodia road; unfortunately, we do not have comprehensive archaeological and topographical information on the disappeared city of Forum Clodii, or on the actual route of the Roman road. The study demonstrates the presence of a specifically planned territorial project, which determined the settlement choices and the articulation of the road network that even today constitutes the substratum of the Agro Braccianese. The study suggests a different and innovative reading of the urban and territorial history of the region of reference.

Introduction

Tracing a framework of Etruscan settlements and roads in a simple and coherent way is a difficult operation. What we know is that, originally, they set on ridge paths which were structured on geological lines traced by the River Tiber and the Tyrrhenian Sea. If we could hypothetically reconstruct the territorial system of the Etruscans, we could be more certain about the territorial planning system used by the Romans.

Through the application of the *Forma quadrata Italiae* theory, performed by Giancarlo Cataldi, we can today reconstruct the ancient planned structures of the Romans (Cataldi, Iacono and Merlo, 2000; Cataldi, 2003; Cataldi, 2004). The architectural theory[1] is placed among the pre-Roman phases of the territory (ridge theory of Saverio Muratori) and the so-called "medievalization" phases theorized by Gianfranco Caniggia (Caniggia, 1976).

Cataldi's theory is based on the recognition of two main systems used for the territorial project. The first is oriented according to the cardinal axes called *Secundum coelum* (SC); the second is oriented according to the morphology of the places, called *Secundum naturam* (SN). The land organization and division is based on squares with sides of 12 Roman miles, called *Ager*.

Finally, the starting point of this system was recognized in Rome, on the Campidoglio hill[2] (Rodriguez Almeida, 2000), called *umbilicus Urbis*. The paper experimentally applies this theory to the case study of the lake Bracciano, reconstructing the structure of the *Ager Foroclodiense* and the layout of the via Clodia (Magazzù, 2019).

Field of application

The reference cartographic base is made up of IGM 1:25.000 drawings relating to the territories of Anguillara Sabazia, Bracciano, Castel Giuliano, Manziana; these were integrated with the IGMI tables with a survey base dated 1879.

Aerial photographs taken for military purposes during the Second World War were also used (Shepherd, Cantoro and Ramondino, 2017).

This case study is singular because of the morphological conditions of the area. Lake Bracciano is located within a large volcanic and tectonic depression that has shaped a geomorphologically impervious territory; as in the north-west quadrant of the lake, between Vicarello and Oriolo Romano, the flat areas are very rare and these are alternated with hilly reliefs that ripple over 500 meters above sea level.

Only the Bracciano and Martignano lakes are preserved today, but up to the nineteenth, there were six lakes; these depressions in the ground have encouraged the development of routes set on the ridges around the lakes, creating typical radial territorial systems.

The geometric mesh oriented on the cardinal points *Secundum Coelum* (SC) is composed of large multiple squares of the *saltus* (sides of 12 Roman miles) of which the second north-west of Rome incorporates the territory under consideration.

From the point of view of the project, the north-west south-east diagonal is an important distribution axis linked with the *umbilicus urbis*; this axis should ideally coincide with the Roman roads Clodia-Cassia (Hemphill, 1975).

By tracing both diagonals of the Braccianese "*ager*", a first element of correspondence is immediately identified with the overall design of the square shape: the center of the square (*ager*) coincides with the city of *Forum Clodii* in the current area of S. Liberato, a place which we archaeologically know little about and which became one of the most important cities of southern Etruria[3] and which was responsible for the administrative-territorial control of the whole district (fig.1).

Once established a first fundamental point for the project reconstruction, it is necessary to relate to the large lake of Bracciano (*Sabatinus* for the Romans). The lake required detailed surveys aimed at the correct continuation of the territorial design, due to its impressive presence (about a quarter of the "*ager*").

By observing the lake from a satellite view or from one of the heights that surround it, one notices how this can be assimilated to a circumference: this fortunate circumstance inspired the cartographic survey of surveyors. They gave a careful representation of the main natural obstacles using the same geometrizing logic used for spatial planning.

To correctly represent the lake and to establish the planning cornerstones, it can be assumed that the Roman designers resorted to a fairly simple method based on two privileged observation points.

These are two places located respectively south and north of the lake, in line with the *SC* orientation.

The first point, the southern one, can be found in the locality of *I Monti* (IM), the most prominent hill south of the lake. This is a strategically fundamental place to observe the "plain" in Rome direction, or to examine the surroundings of the lake towards the opposite side. The site is located exactly on the main diagonal of the "*ager*", the same on which the center of *Forum Clodii* (FC) was determined.

The second place consists of the highest elevation of the Sabatini mountains corresponding to the Rocca Romana mountain. The typical pyramidal mountain's skyline is still used today by the locals as a reference point for determining the north.

The observation point used for the design phase can be identified a little further east, near Rinaccetto mountain (MR), a place which is similar in altitude to the observation point of *I Monti* and perfectly aligned to it on the north-south axis.

Geometrically and projectually, it will be enough to trace the perpendicular axes passing through the midpoints of the segments described; doing so, it is possible to find an intersection point coinciding with the center of the circumference, which can be represented with a compass (fig. 1).

Using *pertica*, *groma* and wooden poles, the FC-IM segment can be reproduced, in particular using the heights as natural reference points towards which to direct the *groma*. The measurement of the distance of *Forum Clodii* and *I Monti* from the coastline allows to identify the two points P1-P2 (the chord) which determine the circumference passing through three points; together with the median one of the FC-MR segment (P3).

The importance of the *I Monti* location is confirmed by RAF flights (fig. 1). It is possible to distinguish with precision the remains of an ancient road system set on the ridge on the photographic strips. The road system has (at the IM point) the shape of a rectangle. Probably, the road surrounded a built place which must have had an important role since the time of the Etruscans, subsequently reused by the Romans in a first phase of territorial control and planning and in probably a subsequent residential use (Quilici and Quilici Gigli, 1975; Hemphill, 1975) .

We recognize a long stretch of via Clodia which remains perfectly straight for three kilometers in the direction of S. Maria of Galeria, referring to the information coming from the critical reading of the aerial photographs created for war purposes (below the locality *I Monti*, near via Mainella). The stretch is still recognizable in the satellite views, as well as on the IGM tablets and on the map of the Comarca of Rome (Catasto Gregoriano), in which it constitutes the geographical border with the Agro Romano. For the *Forma quadrata*'s purpose, it will be useful to observe how the axis designed (the via Clodia) goes roughly towards the southeast corner of the "*ager*" *Foroclodiense* and, from that point, you turn sharply to the left.

There seem to be two explanations. First, the road section has an unequivocal trend in the *I Monti* locality of which was to constitute an almost "sacred" observation place (*spectio*?) in an initial phase of territorial planning. This is once again demonstrated by the (less evident) presence of a road section that from Mainella continues towards the walls of S. Stefano, recognizable by RAF photographs. The second explanation is of a design nature. Once the planning cornerstones were established, the main road axis (Clodia), in its mature phase, was rotated 45 degrees in order to follow the trend of the *SC* oriented grid. In addition, the straight section of the previous structure has been maintained. This inevitably led to the formation of an angle which also served the function of connecting joint with *Angularia* = Anguillara[4] (Cordiano, 2011).

A large grid composed of *saltus* oriented *Secundum Naturam* (SN) is superimposed on the large "*ager*" oriented with respect *SC*. (fig.2)

The morphology of the territory does not allow for an internal re-division of the *saltus* into canonical centurias (sides of 710 meters) whose presence was not found in the course of the investigation. The hilly and mountain reliefs must have oriented towards

flexible design choices, constantly adapted to the places in order to facilitate the flow of water. For these reasons, the *SN* mesh is composed of three variously rotated groupings of *saltus* (2 by 5); these are arranged parallelly to the trend of the secondary ridges that develop like a comb around Lake Sabatino.

The first of these meshes (2 by 5 saltus) is perfectly oriented *SC* and slightly shifted to the west. The southern border coincides with the city of *Forum Clodii* which is located on the same horizontal axis as Monterano.

The second mesh is rotated 55 degrees with respect to the first, in the direction of the northeastern corner of the "*ager*". The analysis of this grid is particularly interesting because it could be a direct derivation of the initial FC-MR segment used for the lake design[5].

Forum Clodii is located exactly at the central vertices of four *saltus*. This confirms the previous topographical reading which places the city at the center of the planned territorial system (figg. 1,2). The third mesh is rotated 5 degrees compared to the first, in the direction of the southeastern corner of the "*ager*" in line with the trend of the ridges.

Topographical checks

Once the *saltus* mesh designed for the *Ager Foroclodiense* has been identified, we intend to start a series of topographical checks in order to demonstrate the validity of the reading made.

An initial verification consists in recognizing and redesigning the agricultural subdivisions detectable by the territory.

The method used is based on the use of overlapping and geo-referable cartographic and photographic sources.

The map of the Catasto Pio-Gregoriano was superimposed on the IGM surveys with which the aerial photographs were integrated (taken between the 1940s and 1950s and the satellite images distributed by Google Earth referring to the periods 2002-2018).

With a critical reading of the sources, the main land divisions that are still visible have been reported, attributing a line to those whose course was consistent with the reference *saltus*. The three meshes are recognizable by the use of three different colours (fig. 2).

The elaborated data show a better conservation of the agricultural subdivisions in two main areas. The first can be found in the west, between the *Aquae Apollinares* and *Monterano* (1). The second, however, north of Oriolo Romano (2); in the latter case, there is an additional mesh graphically shown in dashed lines.

Among the sources, aerial photographs taken for military purposes provide the most conspicuous information potential on which a thematic study aimed at redesigning all recognizable divisions should be performed. For this reason, a second check was chosen by isolating points 1 and 2 mentioned above. The photographs were oriented on the north-south axis and the centurial mesh was redesigned on them through a critical reinterpretation of the visible agricultural subdivisions.

The presence of the *diverticulum* which, detaching from via Clodia just north of the locality of Vigna di Valle, led to the Terme di Stigliano (*Aquae Apollinares*) was highlighted.

The resulting centurial shirt reveals full compliance with the reading of the *Ager Foroclodiense*. Beyond the Devil's Bridge, it is noted that the *diverticulum* for Stigliano perfectly responds to the orientations of the two meshes of *saltus* (by tracing the structures or crossing them diagonally). The centurial grid seems to be composed of square modules divided into sides of nine *actus* each. (fig. 3)

The situation is similar also in point 2, north of Oriolo Romano. The main mesh is crossed by the long straight road of via Clodia which is arranged consistently with it and is composed of a rectangular modulation referable to sides of 6 by 8 *actus*. It is interesting to note how the agricultural subdivisions rotate by ninety degrees accompanying the trend of the soils to facilitate the outflow of the waters (to east). In the north-eastern part, the photograph highlights at least two other centurial systems corresponding to as many grids.

The analysis of the urban layout of the historic villages of the Bracciainese area is the fourth verification which was carried out. All the main urban places have been

deliberately shown on the project image, even though they cannot be traced back to Roman settlements. This is because the territorial structure impressed by the land fabrics remains incisive and still recognizable.

Bracciano presents two distinct developments of the village. The medieval nucleus is recognized and a phase of building expansion that surrounds the ancient nucleus is distinguished. Two road straights indicate a Renaissance reorganization of the access to the village: the first one is the continuation of via Umberto I towards via Braccianese, the second coincides with the current via Salvatore Negretti.

Both ways seem to follow the reconstructive structure of the *Forma quadrata*. In particular, the first street looks like a rearrangement of a previous connection route between the village of Bracciano and the area occupied by the Capuchin monastery; that is the limit beyond which the centurial cadence (still visible) rotates in response to the southern *saltus* system. The second straight is vastly affected by the presence of Renaissance-style building fabric[6] which developed on the fastest and most practiced connection route of connection to the Braccianese in the direction of Rome. A little further east, at a lower altitude of about ten meters compared to the just described road, there is a road layout whose course is almost parallel to via Negretti, the via Cupetta del Mattatoio. Its "sinuous" course on the hilly coast is clearly visible on the Catasto Gregoriano; on the contrary, via Claudia (the straight road opened during the second half of the nineteenth century) is not reported.

The foundation of Oriolo, which took place in the second half of the 1500s by Giorgio Santacroce, is an interesting example of a Mannerist city (Bruschi, 1966). The village, protected by walls, stands on a slight hill on the left of via Clodia. As in the example of Bracciano, the road directives converge in the main square of the village, the prospective fulcrum of the Renaissance scheme. The choice of the site could not have been accidental. The organization of a huge urban construction site, which included huge deforestation and construction works, had to necessarily take place in an area which was at least at the centre of a defined road layout.

Even Anguillara, located at the limit of the hypothetical "*ager*" of design, responds to the orientations of the *Forma quadrata* with a central matrix path, slightly rotated to north-east in order to place the generating axis of the plant exactly in the centre of the promontory.

Conclusions

In conclusion, the route of via Clodia on the three identified meshes of saltus was highlighted. The road was first rebuilt through archaeological findings (Ward Perkins, 1955) and subsequently designed as a series of segments adapted to the *saltus* meshes.

Once again, the path of Clodia seems to perfectly respond to the meshes of *saltus* reconstructed in a procedural and re-design way (fig. 4).

This opens up to original and innovative research fields (together with the previous checks) that lead to reviewing the history of the formation and transformation of the Agro Braccianese. Having always been recognized by scholars as a road axis deriving from adaptations of Etruscan routes, the Via Clodia is now identified as a fully designed axis at least up to Oriolo Romano.
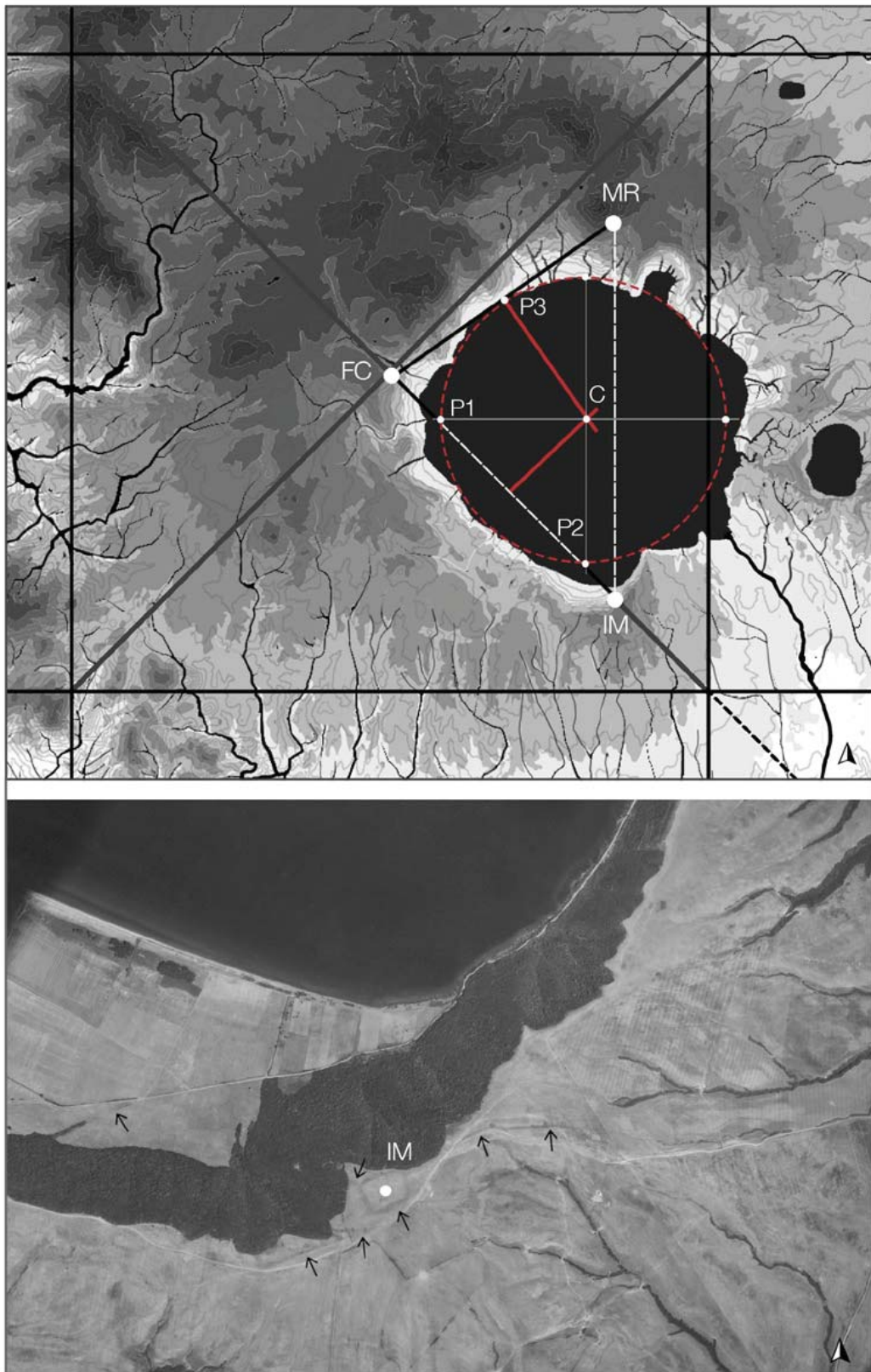
Figiure 1. The territory of the Agro Bracciano. Geometric construction of the lake Sabatino (drawing made on IGM basis scale 1: 25.000 by the author) and the identified point in the locality I Monti (IM) in an aerial photograph from 1944. Presence of the ancient road system. Flight RAF 143, 420, 4040 (Aerofototeca Nazionale of Rome).
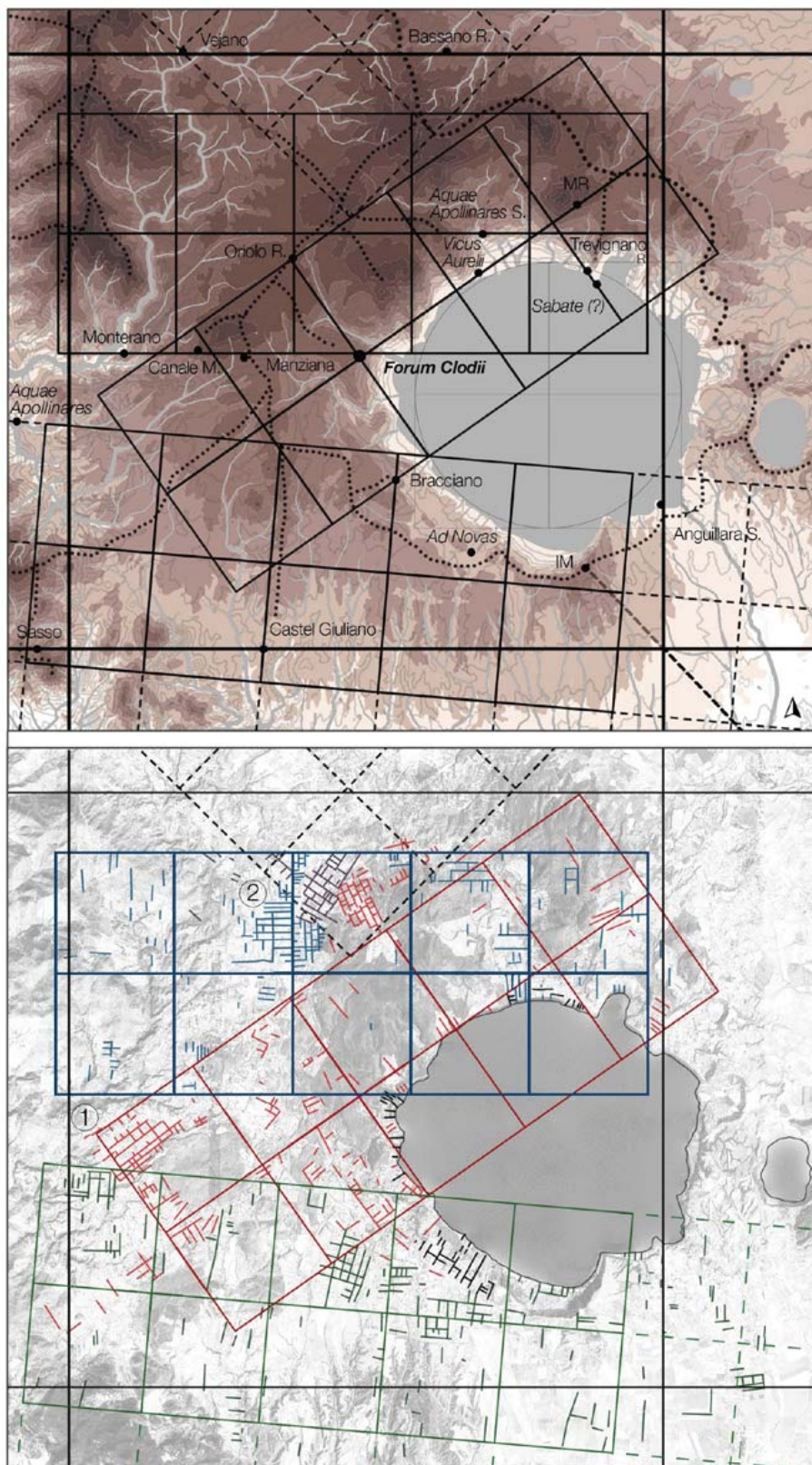
Figure 2. Hypothesis of a reconstructive reading of the Roman project of the territory of the Agro Braccianese (*Ager Foroclodiense*). Continuously, the mesh of *saltus* identified (drawing realized on IGM basis scale 1: 25.000 by the author). In the figure below, land divisions that are still visible.
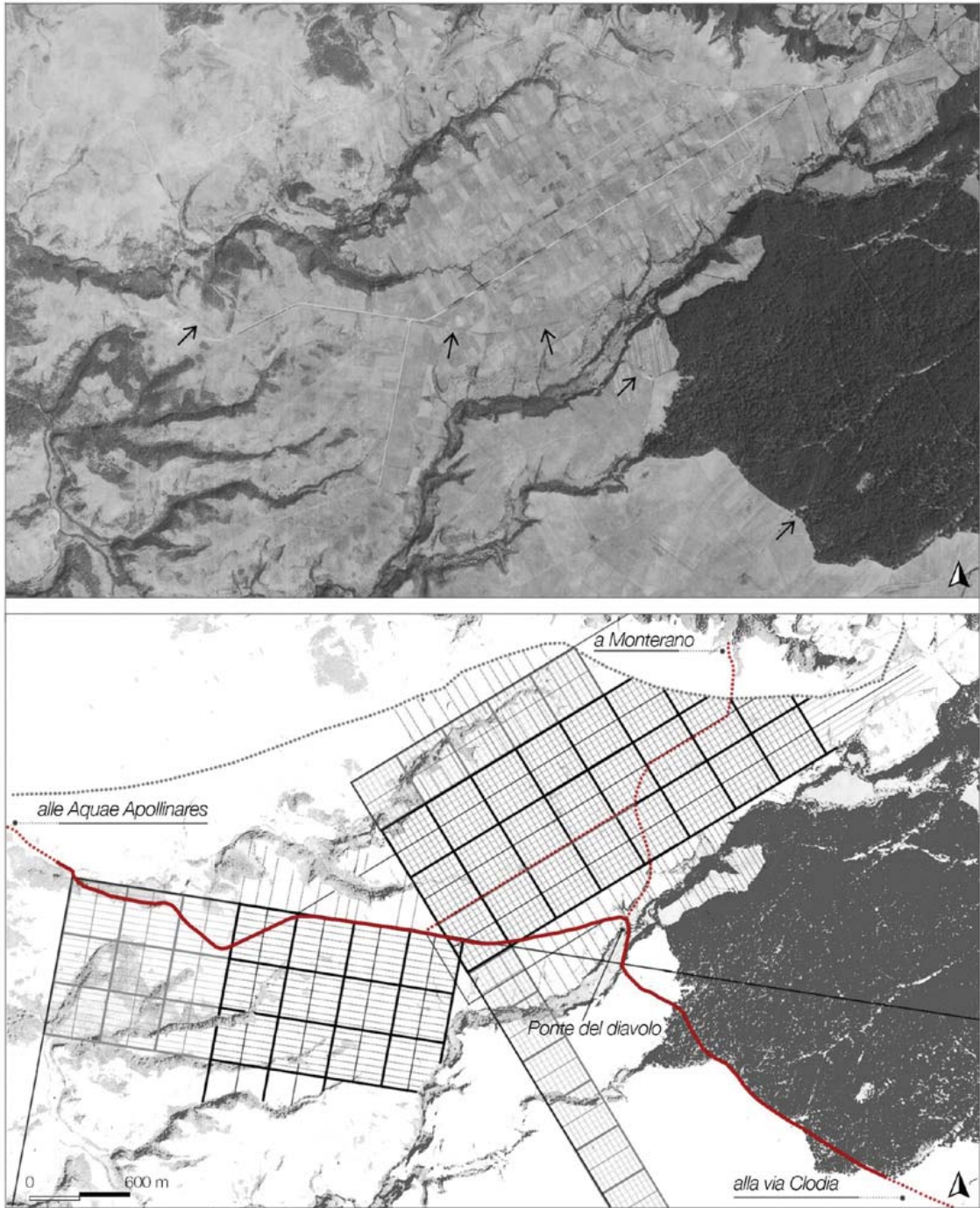
Figure 3. Reconstructive reading of Roman planning close to the diverticulum for the *Aquae Apollinares* of Stigliano. Above, photograph RAF (1943), 143, 68, 5008 (Aerofototeca Nazionale of Rome). Below, drawing based on RAF flight, by the author.

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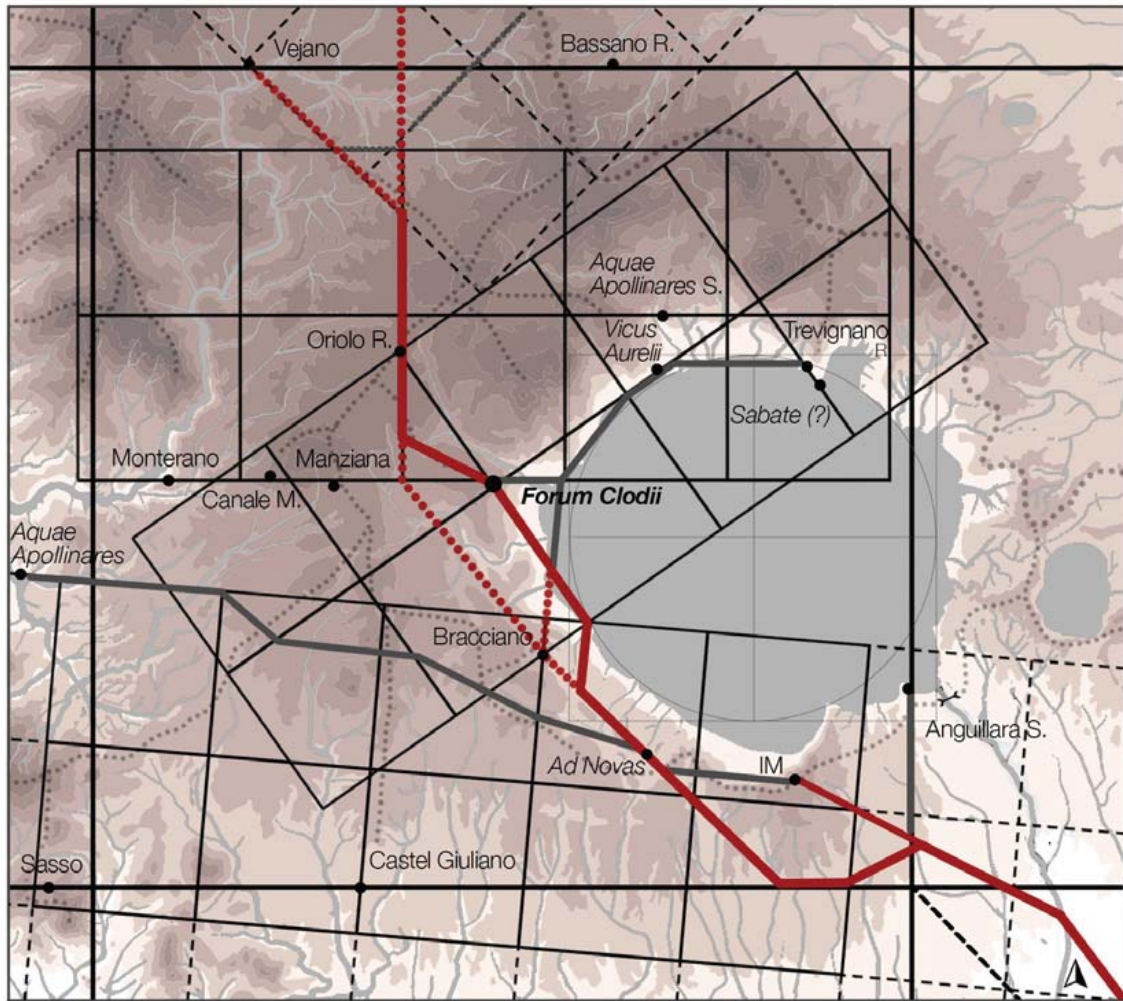
Figure 4. In red, the route of the Via Clodia indicated as a series of segments. These are adapted to the saltus meshes of the Agro Braccianese. In gray, some diverticula. (drawing realized on IGM basis scale 1: 25.000 by the author.

Footnotes

[1]See the bibliography for further details.

[2]The Severan Marble Plan places the Campidoglio exactly in the center of the cadastral plan.

[3]As *prefectura* or *municipium*.

[4]The name of the town it would come from a Roman villa located on the shores of Lake Sabatino. The owner of the villa, Rutilia Polla, could also be the holder of rights fishing in the lake.

[5]Approximate to the length of two and a half *saltus*.

[6]As demonstrated by the Catasto Gregoriano.

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The City of Venice. The Form and the Space

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Keywords: *Venice, historical city, morphology, space, form*

Abstract

The city is a 'system of connection': a set of relationships between building typology and urban morphology, between the positioning of the monuments in relation to the fabrics, between the discipline of the plan and the need to give form to places and spatial quality of contexts. This 'system of connection' is evident in the historical city, which is structured through the formation of dense and compact 'fabrics' and recognizes its element of formation in the concept of 'urban block'. The paper aims to show an experience of research activity at the RWTH Aachen University started from the reading of the urban forms of an extremely singular city such as Venice. Through codified tools of urban analysis and the most recent spatial reading tool of the city - fundamental to understand and define the reasons of architectural project - it's possible to understand the morphology of Venice, characterized by a dense and uniform fabric, in which the only open spaces are the 'campi'. A careful consideration also identifies the extremely articulated urban fabric of Venice: many are the 'primary elements', such as the great religious complexes and prestigious buildings, which represent the 'catalyst' of the historical Venetian fabric. Recalling Schröder's studies, for which the urban form is examined in its spatial value, measuring the degree of interior or exterior spatiality that characterized the spaces of the city, Venice, historical city, is the emblem of the city made of delimited and compressed spaces, and of interior's spaces.

[...] analyzing the form of a city is as scrutinizing the face of a loved person. When we entertain ourselves in the study of the places it contains or when we sink into the overlapping of its layers, we do it driven by the desire to tear its secret away from the city, trying to find the key to our fascination and then, calm it down, get rid of it.[1]
Carlos Martí Arís

For a relative short period of my university education, which coincides with the elaboration of the Master's degree thesis in architectural and urban composition first at the Rheinisch-Westfälische Technische Hochschule Aachen with professor Uwe Schröder then at the University of Naples Federico II with the professors Federica Visconti and Renato Capozzi, Venice has become the city I wanted to scrutinize, understand and from which I wanted to tear away the secret that makes it unique and singular compared to other Italian cities.

Again Carlos Martí Arís affirms that «analyzing is equivalent to redescribing: only through a detailed work of redescription of the city we will be able to perceive its intimate substance. Perhaps this is one of the few paths that allow us to understand the urban form and at the same time to think about its possible transformation» (Martí Arís, 2007). For this reason, the first phase of the project *The Peggy Guggenheim museum in Venice* has concerning the work of redescription or, precisely, of redrawing, intended not as a mere graphic tool but as «a form of specific, critical and irreplaceable knowledge» (Ugo, 2008), of the city of Venice in order to read its urban forms and to think about its *transformation*[2] by virtue of the design action.

The form of the city
To fully understand the *urban form* of Venice, as well as its formation process, it is of fundamental importance to analyze «the connection [that is established] between the forms of the architecture and the forms of the orographic substrate» (Moccia, 2017), that is «the connection between forms of construction and geography of places» (Orfeo, 2017); after all, «the study of historical experience shows us how cities were never built by turning their shoulders on nature, but in open dialogue with it [...]. If there is something permanent in the city, which transcends any vicissitude or transformation, it is the presence of places which, although fully urban, show a strong link with geography [...]» (Martí Arís, 2007). From this point of view, the Venetian example is absolutely fitting because it is not possible to understand this city without contextualizing it in the singular landscape dominated by the lagoon that crosses it.

The city of Venice manifests an territorial and environmental condition that is certainly different from other Italian cities, located, as it is, in a lagoon context. For all these reasons, the first drawing developed to study the form of the city concerned the restitution of the level curves of the ground as well as the morphobathometry, which allows us to know the evolution of the lagoon seabed.

Once the drawing of the form of the soil has been made, showing substantially a flat territory with very broad level curves, the form of the city is described using some consolidated urban analysis tools, which in turn are put in relation with the evolution of level curves and, in this way, with the form of the soil on which the city has been built over time.

The drawing of the *Straßenbau* - from the German "construction of the roads" -, in highlighting the *calli*, the *campi*, the *rughe*, the *sottoporteghi* of the historical city, allows us to deduce the structure of Venice, in fact, as Giorgio Grassi affirmed, «isolating the *Straßenbau*, that is the construction of public soil, means isolating the constituent elements of the city as architectural facts; it means considering the city above all as a construction, as a stratification and as a composition of formally identified elements» (Grassi, 2008). In the historical city of Venice, the layout returns the image of a dense and a compact city: being Venice a city that determines its form starting from the block, the

drawing of the unconstructed spaces represents both the negative of the built - which stands out by inversion - both the form of the public space. This is a peculiarity of historical cities, in which the "layouts" have the function of regulating the form and impressing an order, thus representing a fundamental component of the urban composition capable of generating a precise connection between the built space and the open space, between the "full" and the "empty".

If the unconstructed spaces are represented by the "road plan", the built space is outlined by a further codified urban analysis tool, that is to say the *Schwarzplan* - from the German "black plan" and from the English "figure-background plan" - which «represents all the elements of the constructed and eliminates any other information, immediately allowing a first reading of the "figure" of the city against its background» (Visconti, 2017). The historic city of Venice is characterized by a compact and homogeneous fabric, in which the only points of discontinuity - that is those that appear in white on the drawing in the figure 2 - are the spaces occupied by the *campi* - Campo S. Stefano, Campo S. Anzolo, Campo Manin in the *sestiere* of S. Marco and Campo S. Vio in the *sestiere* Dorsoduro - and by the only Venetian square Piazza San Marco[3], excluding Piazzale Roma that is rather a car terminal: therefore, there is a close relationship between building typology and urban morphology for which the *Straßenbau* and *Schwarzplan* constitute each other's negative. Furthermore, the drawing of the built space allows to reflect on the «different possible ways of aggregating the types of housing» (Monestiroli, 1979), that is, the way in which building types conform the block, representing systems fixed through which the historic city is built. The building type that finds wide application in the Venetian area refers to the type of the courtyard block: the city, in fact, is characterized by a repetitiveness of the building solutions, which are enriched with courtyards of mostly regular form and, in many cases, private and therefore inaccessible. In fact, it is a difficult challange to cross the Venetian city and freely admire its courtyards, a symbol of the city's building image, on which much has been discussed and analyzed[4].

The primary role that the Venetian *courtyard* assumed in the organization of the housing settlement is very evident also from a careful examination of the *bird's eye View of Venice*[5] by Jacopo de' Barbari as well as from an analysis of the toponymy present in the several documents concerning land registry of the Republic from the sixteenth century to the eighteenth century. In fact, the Venice that Jacopo de' Barbari describes at the end of the fifteenth century shows a fabric shaped by quadrangular courtyards - in some cases belonging to great religious complexes and in others to individual *Palazzi* - which rarely give space for the sporadic presence of long terraced of symmetrical houses. The fact that the sixteenth-century representation is not exclusively a simplification or a conventional indication of Jacopo de' Barbari is also confirmed by the later plants[6], which leave no doubt about the primary role of the courtyard in organizing the housing settlement in the city of Venice. The only area where the presence of the courtyard seems to be less rooted - but not missing as shown by the *Fondaco dei Tedeschi* - is obviously the *Rialto* area, which has always been the commercial center of the city, where the prevalence of merchant functions means that the spaces easily take on the connotation of public transit space, thus denying the private environment of the courtyard and instead adopting the typology of calle and ruga in its original meaning of «medium-width road flanked by houses and shops» (Diodati, 1926).

As Aldo Rossi affirms in his famous book *L'Architettura della città*, the city is made up of "residence areas", but also of "primary elements", that is, elements «capable of accelerating the process of urbanization in a city, and they also characterize the processes of spatial transformation in an area larger than the city. Often they act as catalysts» (Rossi, 1966; 1982). These assume a determining role in the dynamics and structure of the historical Venetian city, in fact «it is arranged in different ways but always with these fixed elements» (Rossi, 1968), around which has burdened, over the centuries, the Venetian urbanization. The presence of these "elements" shows an absolutely differentiated urban fabric: in fact, there are numerous great religious complexes - the convent of S. Stefano in the *sestiere* of S. Marco, the complex of Santa Maria del Rosario in the *sestiere* of Dorsoduro - and the prestigious *Palazzi* - Palazzo Ca' Corner, Palazzo Cavalli-Franchetti,

Palazzo Grassi, Ca' Rezzonico, Palazzo Venier dei Leoni - which overlook the 'more specifically urban space', that is the Grand Canal.

Venice is therefore a city in which the connection between the forms of the soil and the forms of architecture is very strong, to the point that geography has determined the character of the place even before architecture took office. It is characterized by a dense and homogeneous fabric, by repeating plots and systems, but also by great architectures with which Architecture represents its collective values and finds in the courtyard type the maximum expression of the organization of the housing settlement.

The space of the city

A representation that intends to analyze and, therefore, re-describe the "formal image" of the city of Venice in order to understand its form and think about its possible transformation by virtue of the design action cannot absolutely ignore an analysis of the spatiality of the places of the city. In the field of urban studies, in fact, it is believed not only that form and space are two inseparable concepts, but that it is precisely the architectural space that is «recognized as the primary and essential one of architecture, through which the architectural form is put back into your service» (Schützeichel, 2010). The general theme of the spatiality of the city is at the center of the theoretical reflection of Uwe Schröder - professor in the *RWTH Rheinisch-Westfälische Technische Hochschule* in Aachen and head of the *Spatial Design* Department of the same university -, who believes that «the new description of the city lived it does not take into consideration as much the formal image as the spatial aspect of architecture, the structural order of architectural spaces, the arrangement that determines their form» (Schröder, 2009). Based on this "renewed" analytical approach related to the spatialist reading of the city, inaugurated with the *Pardié* project, Uwe Schröder introduces a new instrument for reading the urban form of the city - the *Rotblauplan* - which allows you to understand the spaces of architecture by distinguishing them in "warm" spaces, defined interior's spaces, and "cold" spaces, exterior's spaces. To understand when a space can be defined as an interior or an exterior, it is essential to refer to two concepts: the concept of limit and the concept of relationship. Oswald Mathias Ungers, master of Uwe Schröder, believes that «when man consciously detaches an isolated piece and from the clear borders from the infinitely great and boundless space of nature [*Raum der Natur*] and in some way delimits this piece - albeit only with a gesture - [...] it is already creating architecture, even if in the broad sense» (Ungers, 1982). In the first place, therefore, the concept of limit that defines a space and establishes a demarcation between the interior's space and the exterior's space represents a basic notion for debating the architecture of spaces. Next to the concept of limit, there is the concept of "relationship": a space is defined as an interior or an exterior based on the section relationship that is established between the height of the buildings and the space between the buildings. A space delimited by architectural constructions but uncovered - squares, streets, open spaces, courtyards - is to be understood as an interior's space when certain relationships occur between the unconstructed space and the built space. When, however, these relationships fail, space is no longer to be understood as an interior but as an exterior's space. This is the reason why, the previous study to *Rotblauplan* concerns the classification and the representation with sequences of vertical sections of the relationship between the streets, the courtyards and the buildings (Fig. 2, on the right). This allows to highlight the characteristics of the spaces - narrow and wide, profile of the sections - and to understand the relationships that define the spatial form of the city. This type of study applied to the city of Venice in most cases reveals a relationship between the height of the buildings and the unconstructed space for which they are intended as urban "interiors". Venice, in fact, mainly takes on an interior character, with the exception of the Grand Canal, where the relationship between the built spaces and the canal is such that it is classified as an urban "exterior". The analysis of urban spatiality through the *Rotblauplan* analysis tool moves between different representation scales, offering, for each of them, the possibility of adding additional levels of knowledge through different graphic indications: it provides, in fact, a graphic coding that returns different tones of color by virtue of progressive levels of

interior or exterior of the spaces depending on what is intended to be highlighted, from the large-scale relationship between city and territory, between the city and the home up to the relationship "attributable to a architectural scale" between the house and the room, between the wall and the openings (Schröder, 2015). In particular, in considering the scale that highlights the relationship on the great scale between the city and the territory (Fig.3, on the left), it uses two different tones: light red and light blue. The first coding - light red - concerns the interior's spaces and, therefore, those spaces which provide for "closure" but can be both uncovered and covered. The second coding - light blue -, instead, concerns the exterior's spaces and, therefore, those spaces that declare "a rural or landscape link" or "an urban link". Furthermore, no graphic sign is represented at this scale except fot the different shades that indicates the nature of urban spaces.

A different situation, however, occurs when it's highlighted a portion of the city and, therefore, in this case, the scale of representation allows to add more information to the drawing (Fig. 3, on the right). In fact, there are two different shades which represent the spaces indicate "closure" but which are covered - dark red - and the spaces indicate "a rural or landscape link" - dark blue -, and there are also the graphic signs, which assume a fundamental meaning in order to understand the nature of the spaces of the city: while the white lines - the walls - indicate the "active boundary" in the formation of the space, the black lines – marking or profiling - symbolize the "passive boundary". These two analyzes, still on an urban scale, allow us to understand how Venice, in appearing a dense and compact city, mainly assumes an interior character, relegating the entire lagoon landscape including the Grand Canal to an exterior role.

Finally, the spatial analysis was carried out on the scale that connects the city and the house, as Schröder says, and that in the case of the Venetian city we could say between the city and the *Palazzo* (Fig.4, on the left). In highlighting this new relationship that can be traced back to an architectural scale, alongside the different color tones - dark blue and light blue, dark red and light red - which represent progressive levels of interior and exterior and lines - white or black -, additional "graphic symbols" appear: the black shaded area represents an inclusive "dedication", and the white shaded area, which instead indicates an exclusive "dedication".

This spatialist approach, perhaps less scientifically objective than the type-morphological one previously addressed, as it introduces the perceptual and phenomenological variable, is however of significant interest «to the extent that the mapping of space leads toward topological and typological fundamentals, and consequently toward analytical and conceptual prerequisites for designing and for the design, it can be characterized and understood as a design method» (Schröder, 2015). The fundamental character of this analysis is, therefore, its design vocation: it always implies a judgment on the quality of the existing spaces within the city and allows to prefigure, with the project, the possibility of modifying its nature as shown in the project *The Peggy Guggenheim museum in Venice* (Fig. 4, on the right).

Conclusions

The main goal of the analysis through the developed drawings is to analyze the *forms* and *space* of the city of Venice using both codified and objective tools of urban analysis and more recent and original tools such as spatial analysis, which allows to introduce the third dimension - the spatial one - in the architectural field. For this reason, therefore, it was necessary that the analysis made use of the critical redrawing, which, through a reduction of the complexity of the signs and therefore throught abstraction (Moccia, 2015), allowed to transfer the elements that make cognizable, describable and objectivable a city. The representation, thus, becomes a moment of knowledge and therefore of critical analysis. It is for this reason, in fact, that in the case of the study of the forms and space of the city, each drawing should be able to express the content that has been examined. The drawings developed for the city of Venice, starting from the city up to the typological definition of its architecture, intend to analyze the city from a point of view that intend to investigate at the formal and spatial structure of the city, looking at the architectural and urban design.
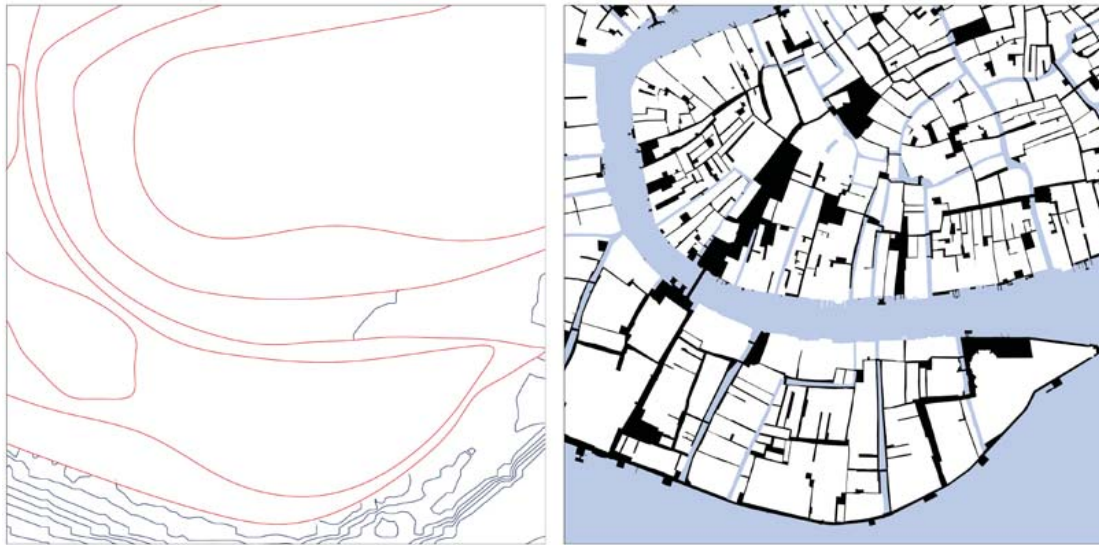
Figure 1. Left: orography and bathymetry. Right: *Straßenbau* or 'road plan'. Author's drawing.
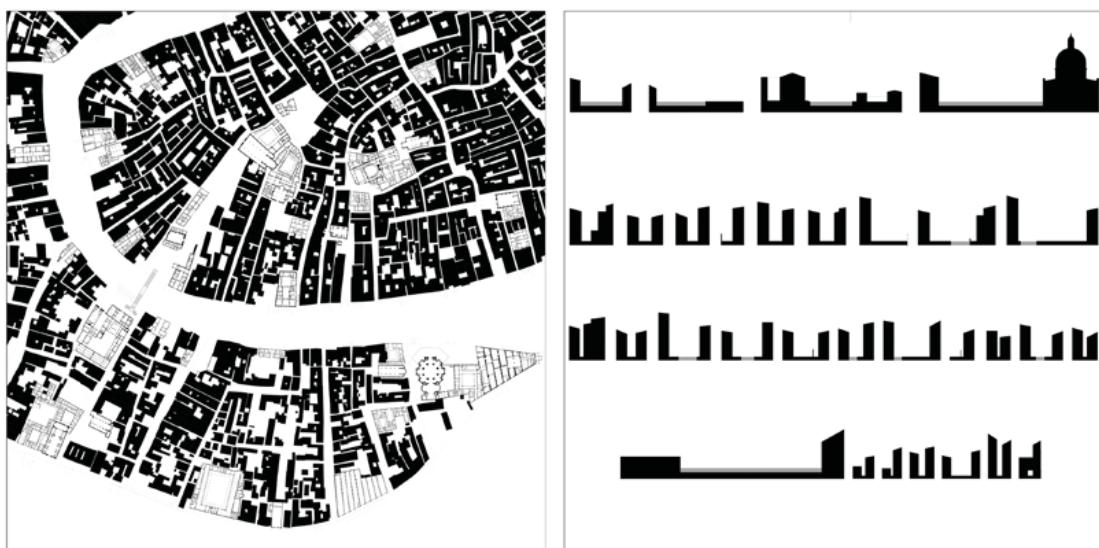
Figure 2. Left: *Schwarzplan* or figure-background plan with the typology of the 'primary elements', that is the great religious complexes and prestigious buildings relating to the *sestieri* of Dorsoduto and S. Marco, object of analysis of the Master's degree thesis in architectural and urban composition *The Peggy Guggenheim museum in Venice*. Right: study of the relationships between the 'solids' and the 'voids', between buildings and streets, squares and canals. In particular, starting from left to right, there are sections that intercept different points near Gran Canal and following Calle S. Agnese, Piscina Venier, Piscina Forner, Rio de San Vio, Campo San Vio, Calle della Chiesa, Rio de le Toreseie, Calle San Cristoforo, Campiello Barbaro, Calle Bastion. Author's drawing.

Figure 3. Left: Venice, red-blue plan, plan segment "country and city": red = interior space; blue = exterior space. Right: Venice, red-blue plan, plan segment "city": red / light red = enclosure: on all sides (covered) / not on all sides (uncovered); blue / light blue = linkage: rurale or landscape / urban; white line = space formation: active boundary (wall); black line = space formation: passive boundary (marking, profiling). Author's drawing.

Figure 4. Left: Venice, red-blue plan, plan segment "city and house": red / red light = enclosure: on all sides (covered) / not on all sides (uncovered); blue / light blue = linkage: rural or landscape / urban; white line = space formation: active boundary(marking, profiling); shaded area (white) = dedication: exclusive; shaded area (black) = dedication: inclusive. Right: Venice, red-blue plan, plan segment "city and house" with insertion of the thesis work on Palazzo Venier dei Leoni, current seat of The Peggy Guggenheim museum. Author's drawing.

Footnotes

[1] The traslation from Italian of this and the other quotes that follow is by the autor, except Rossi A. (1982), *The Architecture of the city*, Cambridge, MIT and Schröder U. (2015), *Pardié. Konzept für eine Stadt nach dem Zeitregime der Moderne. A Concept for a City after the Time Regime of Modernity*, Köln, Verlag der Buchhandlung Walther König.

[2] Carlos Martí Arís in his writings "Sulla teoria" in *La cèntina e l'arco. Pensiero, teoria, progetto in architettura* affirms that «when designing we always start from the existing architecture that we submit to different comments, variations, developments and transgressions; and from this manipulation, from working with forms, it appears a new, different form, and that is the project. The literal meaning of the word transform [*trasformare*] is "to pass from one form to another"».

[3] It seems appropriate to underline that the urban analysis have been carried out in more detail for the *sestieri* of S. Marco and Dorsoduro, since these are located near the project area, that is to say Palazzo Venier dei Leoni, the current seat of the Peggy Guggenheim museum.

[4] Countless studies have been published on the Venetian courtyard. Among these are mentioned: Cessi R. (1958), "Politica, economia, religione" in AA.VV., *Storia di Venezia*, volume II, Centro Internazionale Arti e Costume, Venezia; Concina E. (1989), V*enezia nell'età moderna*, Marsilio, Venezia; Dorigo W. (1983), *Venezia origini*, Electa, Milano; Lanfranchi L., Zille G. (1958), "Il territorio del ducato veneziano dal VIII al XII Secolo", in AA.VV., *Storia di Venezia*, volume II, Centro Internazionale Arti e Costume, Venezia; Luzzatto G. (1964), "L'economia veneziana nei rapporti con la politica nell'alto medioevo", in AA.VV., *Le origini di Venezia*, Sansoni, Firenze; Muratori S. (1960), S*tudi per una operante storia urbana di Venezia*, Istituto Poligrafico dello Stato, Roma. In particular, Saverio Muratori, in his study on urban fabrics closely linked to the original phases of the historical development of the city, was the first to analyze the Venetian courtyard.

[5] The *bird's eye View of Venice* by Jacopo de' Barbari, dated 1500, describes the city from a very high point of view and assumes a role of fundamental importance, as it represents the only visual testimony of Venice of the sixteenth century in its entirety. The most representative architectures emerge from the urban fabric: the San Marco area, the Basilica of the Frari and the SS. Giovanni e Paolo, the facades of the *Palazzi* in the Grand Canal, the Arsenale.

[6] Reference is made to the perspective plan by Matthaeus Merian (1635), the plan by Ludovico Ughi (1729) and the plan by the brothers Bernando and Gaetano Combatti (1847).

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One new fragment: The Archaeological Museum by Egizio Nichelli (1954/1964)

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Abstract

The project for the Archaeological Museum of Milan by Egizio Nichelli presents itself as a pretext to talk about the creation of an architecture in a stratified context.
Nichelli designs in the historical fabric, where the bombings of 1943 left urban voids.
In front of the former Major Monastery block he recognizes in the destruction the opportunity to rebuild the shape of this fragmented reality. With the search for the essential idea Nichelli chooses the cloistered type as an appropriate compositional principle for give order to the fragments. Following this method, based on the analogy, Nichelli attributes to the correspondence between the new and the old the role of referee in the composition of the site. According to that the court loses a side where the roman remains emerge as a memory of the past, while the new side of the court, parallel to the Church of San Maurizio, recovers its lying and dimension. On one hand the choice of a fixed principle extracts architecture from time, but on the other, the language confirms its belonging to a historical period. As a matter of fact, Nichelli made his own the lesson of Perret and Le Corbusier of the reinforced concrete frame construction. The architect proposes a plan libre *with a pillar structure that allows him to have a* façade libre *with* fenêtre en longueur. *Despite this, the outcome shows how this architecture give depth to time instead of anchoring itself to the idea of an absolute present, immobile and self-referential.*

New and old: constituent parts of the urban fabric

The unfinished is what makes a project necessary. A project is what returns a possible order to a place. Nowadays frequently emerge contexts whose unity has been lost or even never existed; contexts in which are recognized fragments of architecture or urban fragments that do not dialogue with each other.

In an attempt to reform the sense of a place, architects are called to reread the parts using the project as a tool for finding a specific truth. A truth that cannot take the continuity of history for granted, in the awareness that it must be understood in the sense of sequence of fractures.

It follows that the fragment is a creative power, an element that suggests completion, which involves the observer/architect and stimulates his imagination. It is an inexhaustible source for new projects that gives the construction an added value, it knows how to tell, in addition to its own history, what preceded it and at the same time it becomes part of future history.

Aldo Rossi has already supported the actuality and the potential of the fragment:

«Il termine "frammenti" mi sembra adatto a rappresentare una situazione della città moderna, o della architettura o della società. "Frammento" nella lingua italiana significa un piccolo pezzo staccato per frattura da un corpo qualunque. E con ciò esso esprime una speranza, ancora una speranza, e come tale non conviene con rottame, che esprime una moltitudine o un aggregato di cose rotte. In questa dizione, rottame potrebbe essere il corpo della città futura se le cose non dovessero cambiare e sempre più fosse accettato il disordine e poco meditata la previsione del futuro». (Rossi, 1987)

«The term "fragments" seems to me to be suitable for representing a situation in the modern city, or in architecture or society. "Fragment" in the Italian language means a small piece detached by fracture from any body. And with this it expresses a hope, still a hope, and as such it is not appropriate with scarp, which expresses a multitude or an aggregate of broken things. In this diction, "scrap" could be the body of the future city if things were not change and disorder was increasingly accepted and the prediction of the future little thought about».

Then the figure of the architect, through his reading of the city, proposes an interpretation of an a-temporal reality, a reality that makes its own the fragments of the past and projects them in the present and in the future. Architect changes both the hierarchies between the parts and the point of view.

The research[1] proposed starts from a historically determined state of necessity: the need to identify the role of the historical nucleus in order to define the development of the contemporary city, in particular by reestablishing the relationship between design and urban archaeology. But is it possible to bring modernity to historic centers while saving the memory of the past eras? And is it possible to do this by promoting a culture of design that is a true synthesis between the new project and the preservation of the repertoire?

In an attempt to demonstrate that it is possible, this investigation aims to show the importance of the knowledge of the fragments that make up the city and the reconstruction of their memory, so as to promote projects that are able to reform the sense of belonging of the parts to a whole.

The case study chosen is the city of Milan, where the lack of correspondence between the layers becomes evident where the relationship between past and present has not yet found an appropriate answer. The resolution cannot be limited to the discipline of architecture. Defining an architectural and urban project in a consolidated and stratified context the architect cannot ignore archaeology and restoration. Keep in mind E. N. Rogers's words, preserving is to be understood as actualizing the past and building as a continuation of the historical process, then we can say that the architect designs new sequences of synchronic city passages (Rogers, 1958). In this regard it is interesting to show the project made by Egizio Nichelli[2] for the New Archaeological Museum of Milan, a ten-year project between conception and realization never concluded.

This little-known architect, works in the second half of the twentieth century, in the recovery period after the Second World War. He works on the construction of new

schools and sports centers and engages in restorations that have brought to light and valorized several Milanese finds visible today. In particular, with the project for the museum he had the opportunity to work in a context so full of meaning as to influence his way of doing architecture. He designs respecting history and using the past as a building material. A feature that emerge constantly in the architect's work is the desire to leave visible evidence of the fragments of the ancient Roman Milan and to make them understandable.

Invention and inventory

The place where the New Archaeological Museum[3] is located presents itself as an excellent pretext to talk about the creation of an architecture in a stratified context. The block of San Maurizio has been destroyed after the air raids during the Second World War, and its fate is extremely debated until it is decided to re-use it for the construction of the new museum.

This area is between corso Magenta, via Nirone, via Luini and via Ansperto. A piece of city in constant transformation[4]. The medieval complex of the Major Monastery, the nineteenth-century reconfiguration of the blocks, then the war destruction and the reconstruction plan with the "Racchetta"[5], draw a block that is the result of an assembly of different and autonomous pieces. To this the archaeological plan is added, recognizable by the testimony, although fragmentary, of the remains of the ancient Circus, the Walls and the Imperial Palace.

In this part of Milan from time to time the transformations have reformed the constituent elements. The tower of the *carceres* of the Roman Circus in the Medieval times becomes the bell tower of the church of the Major Monastery; the ancient *mura di Massimiano*, the old walls of the Roman Empire, and the walls that supported the stands of the Circus become structural elements to build the new buildings in more recent times. This makes this piece of city interesting in order to deepen the value, not only documentary, but mostly "constructive" and "aesthetic" of the stratification process.

By intervening in a place full of historical traces, Nichelli, architect and restorer, establishes a dialogue with the pre-existence in an attempt to reform its identity. He works by looking at both what remains in the city, as a visible trace of its stratification, and how little or not at all evident remains of the shape, of the morphology and of the metamorphosis of the block.

Nichelli designs in a fragmented context, where the 1943 air raids left empty and rubble. In front of the block of the former Major Monastery he recognizes in the destruction the opportunity to rebuilt the identity of that piece of city, which has been lost. The attempt is to re-established the relationship with urban archaeology by dismantling the individual fragments and by recognizing their belongings to the different sections of the stratified city and, subsequently, making them recognizable again in their autonomy while returning them to a hidden and unified plot of the city.

As an *invention* of the new, the project is at the same time transformation and interpretative synthesis. It is a form of knowledge, a tool for reading the character of the city and a tool for inventorying fragments that compose it and for recognizing significant structures to be used as an analog track of the new architecture.

The search for form: analogies and correspondences

With the search for the essential idea, Egizio Nichelli recognizes in the cloistered type an appropriate compositional principle to restore order to the fragments. He gives to the correspondence between the new and the ancient the role of referee in the composition of the space.

This is what seems to be the constant in the various design solutions, from 1954 to 1959; Nichelli does not change the way he considers the fragment, nor the role he attributes to it in the composition of the block while the language of architecture varies significantly.

To better express what has just been said, it is essential to investigate the first design hypothesis for the museum. This version is free from the constraints of the *Sovraintendenza* and the Client, so it expresses, as well as possible, the genesis of the project, from the

essential idea to the completed form.

The damage caused by the war and the push for reconstruction become the pretext for mixing the hierarchies of the consolidated city and Nichelli, first of all, carries out a process of selecting the elements that he himself considers necessary or, on the contrary, superfluous to the definition of the identity of that place. He foresees very drastic demolition works that, in the wake of the demolitions that were taking place in the old town, "sacrifice" the nineteenth-century buildings and the remains of the cloister, almost totally destroyed by bombing, in order to enhance the remains of the ancient Roman Milan.

In the first hypothesis of the project, Nichelli proposes a plan that is made up of the new and the existing buildings which dialogue but still remain as "autonomous bodies". He designs a courtyard that unites the parts in a harmonious synthesis. The Church of San Maurizio becomes one of the four sides of the "new courtyard" and the element that regulates the entire composition. The size of the Church spans becomes the module on which the new architecture is built, therefore the model for the reform of the place. He proposes a free-plan based on the repetition of a module derived from the study of the San Maurizio complex. But he introduces in this module some variations which do nothing but confirm the rule.

The citation of tradition, or the different repetition of what is already given, is building material for the Archaeological Museum.

Along via Nirone, can be identified a "gallery" which clearly denounces its being another arm of the court, the one in front of the church. The new gallery acts as the counterpart of San Maurizio, it takes its position and dimensions, both in length and width. There is also a correspondence between the two architectures in the definition of the space. The church is built as the composition of two churches, the first on corso Magenta, that of the city, and the other, facing the block, that of the cloistered nuns. This architectural element that establishes a clear separation occurs immediately adjacent to the layout of the *Mura di Massimiano* that cross the block at a lower altitude; exactly aligned with this, a variation of the module is inserted in the gallery. Thus, the regularity of the *intercolumnio* between the pillars undergoes an alteration which increases its value giving more breath and therefore importance to the archaeological remains.

The correspondence between the new and the old is the compositional principle of the project, the pre-existence is a matter for building the new, both physical and theoretical, so the project assumes its responsibilities by innovating the original settlements of the block and the city. The entire architecture is built from the height of the Roman remains and does not exceed the height of the church, in particular, the volume of the entrance hall is designed with the same height as the cloister, maintaining both the ridge of the pitch and the height of the eaves, through a proportional ratio of the spaces in plan that includes the green area. This part of the project – on which the only axial relationship is established – unites corso Magenta, so the city, with the archaeological remains.

The third arm of the courtyard, which overlooks corso Magenta, is made up of the existing fifteenth-century cloister, doubled by the new access volume, and substantially is made up of a volume that derives directly from the dimensions of the cloister courtyard. Nichelli entrusts the corner solution of the block to this new element, proposing a volume that protrudes from the pre-existing road and which shows itself as the positive inscribed inside the cloister.

The duality between differences and correspondences allows to insert the new within the historical formation process of the block using the memory of the place as a tool of invention. The architect designs a sequence of spaces, taking over the pre-existence in order to allow visitors to reach, through a gradual approach, what constitutes the heart of the composition: the ancient matrix of the city. For this reason, the fourth arm of the court is missing. This happens where the remains of the Roman Walls and the Roman Circus emerge from the ground and present themselves to the city as a memory and testimony of the past.

The outcome shows how the proposed architecture, through a hand-to-hand with the pre-existence, is able to give depth to time rather than anchoring itself to the idea of an

absolute, immobile and self-referential present.

It is undoubtedly true, however, that, while the choice of a fixed principle extracts architecture from time, the language confirms its belonging to a specific historical period. In this regard, it seems that Nichelli has made his own Perret and Le Corbusier's lesson of the reinforced concrete frame construction. The architect proposes a *plan libre*, choosing a pillar structure that allows him to design a *façade libre* with ribbon windows.

What makes Nichelli's work modern is not the value of the figurative choices, which in some cases may even appear questionable, but his ability to define which Milan to dialogue with. The relationship that binds the fragments of the historic city to these architectures generates a new urban syntax where contextual reference promotes typological and figurative research aimed at interpreting, supporting and encouraging the history and actuality of the settlements.

If we can say that the first project looks to the ancient as a theoretical material, as a tool in order to find a proportional relationship, in the second, pre-existence becomes constructive material rather than a theoretical reference. The corner between corso Magenta and via Nirone is preserved and the existing buildings and their planimetric irregularities become an integral part of the new Archaeological Museum's plan. An irregularity that Nichelli makes compositional character of the entire project by designing a porch along the entire perimeter of the block capable of mediating between inside and outside, between the elevations and the shape of the plan. A "space in between" that becomes the limit and threshold between museum and urban space.

The facade is an independent element in the composition. Here the concrete volume of the previous hypothesis and the ribbon windows disappear, Nichelli prefers a few oval openings that intensify on the top floor with the exception of the porch on the ground floor. On the other hand, this unitary element is in opposite with the heterodoxy of the plan, where the traditional room system is abandoned in favor of a sequence of environments in continuity. Here the elements that define the composition do not respond to an overall geometric mesh but refer each time to a specific part of the museum.

The pillared structure is contrasted by a system of walls which take different positions from those dictated by the body of the church and the cloister. The facade that opens onto the internal garden is entirely modulated by an alternation of opaque walls and glass walls, arranged at 120 degrees from each other, which manage the relationship between the interior of the museum and the green designed area between the two towers. In the project, the set of oblique folds accentuates the autonomy of the new, which thus remains differentiated with respect to the structure of the Monastery.

The hypothesis proposed by him arise as a structure in which the "arrangement" of the fragments of history and the description of the urban components trace a certain way of understanding the design composition: the project is built by correspondences and analogies with the ancient and from this result a new unity that rewrites the place. Both the first and the second projects are based on the essential idea of re-make a courtyard in the block of the Major Monastery. The architect goes in two different ways to achieve the same goal. He tries to outline an overcoming of the autonomy of the architectural object in favor of a system of relationships; that is, the construction of a "space in between", which is built through the opposition between fractures and correspondences.

This corresponds to the desire to design a part of the city by putting to system those architectures that define its character, which can be considered "contemporary" with each other because they play the same role in determining the identity of that piece of city. The construction of the place that the architect seems to field consists in the unveiling of the hidden layers, in the mediation and in the comparison between the fragments. He proposes the idea of choosing defined and distinct architectures, ancient and new, complete and incomplete, and through a system of relationships given by measures, distances, paths and points of view, he designs a unique and articulated complex that defines itself on different and complementary levels. However, all this does not exhaust the complexity of the urban question but only shows a particular way of working with architecture with respect to it.

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The re-invention of the fragment

Talking about fragments no longer refers only to the peculiarity of the site of the Roman Circus and to the archaeological remains but means resorting to a metaphor capable of making us understand the role of Nichelli's architecture. Where no total synthesis is possible anymore, architecture cannot be thought as a unitary "object" but as an "element" that is inscribed in a larger composition. These elements are not left free but arranged in a network that determines, we can say, the implicit order of the project. An order that can only be reached through an architectural ensemble in which everything is coherent again.

The museum becomes a place of memory, a container of archaeological remains and a testimony for the stratigraphy of the city. The pre-existing fragments become theoretical material for the conception of the project and an integral part of the new. New that looks like a perfectly defined architecture of the void, whose compositional rules rise from a synthetic reinterpretation of the succession of environments that design the original factory.

The interpretation of the character of the ancient city emerges as what characterizes Nichelli's personal line of work, not to derive its authentic sense but to recognize, in the historical material, significant structures as a trace for the new architecture. The project takes over the historical concatenations and in particular it makes itself the author of a subversive operation towards the ancient, trying to understand which "alternatives" it hides. The project generates a "rewrite" that recognizes the character of the places, referring not only to how they are but, above all, to how they are settled in our memory. History needs the codifying and life-giving force of memory in order not to be just an overlap of forms. In fact, only through memory is possible to reconnect paths that apparently are interrupted, that is to choose a precise architectural way of doing that allows the reconstruction of a cultural identity.

The research carried out on the work of Egizio Nichelli is a continuous return to work on the themes of the city and its construction. Bringing these reflections to the present day allows us to reaffirm the role of the project to direct attention both to the individual architecture and to the place in which it is inserted. The project, the relationships underlying it and the principles that generate it, are the results of an appropriation of different legacies not to overcome them but to draw an architectural landscape.
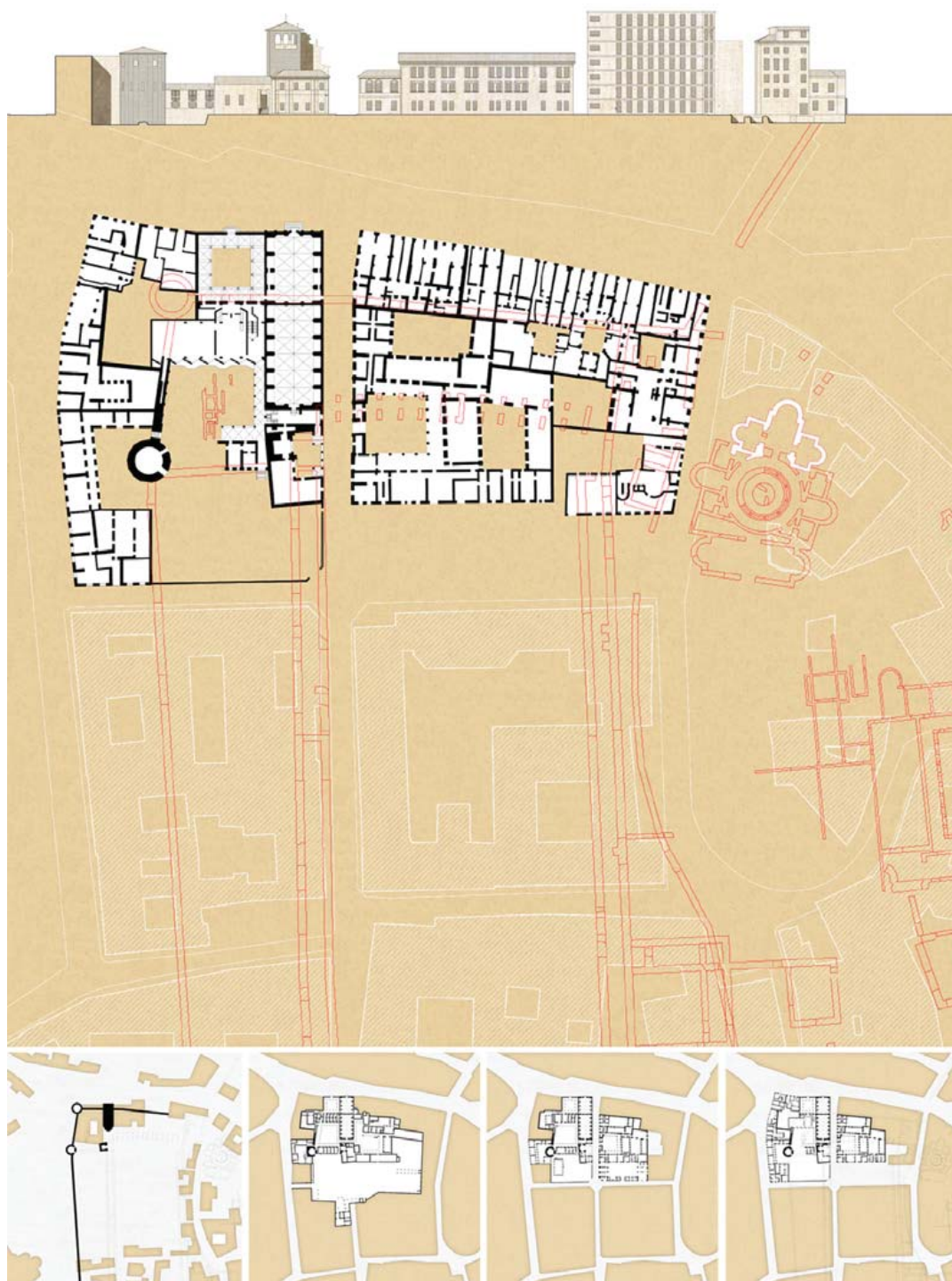
Figure 1. The block of the Major Monastery. Place, instances and latencies
Typological plan of the ground floors of the current state of the block, highlighting the part of the project built in 1964 and the historical sequence of metamorphoses from the 14th century to the present day.
Interpretive drawing showing the overlap of the current city with the archaeological tracks (in red). The remains of the Circus, of the Roman Walls and on the right of the Imperial Palace are visible. The archaeological remains emerge from the ground in some points, and this presence of the ancient matrix tells us about a city other than the real one that shows itself immediately. Drawing by the author.
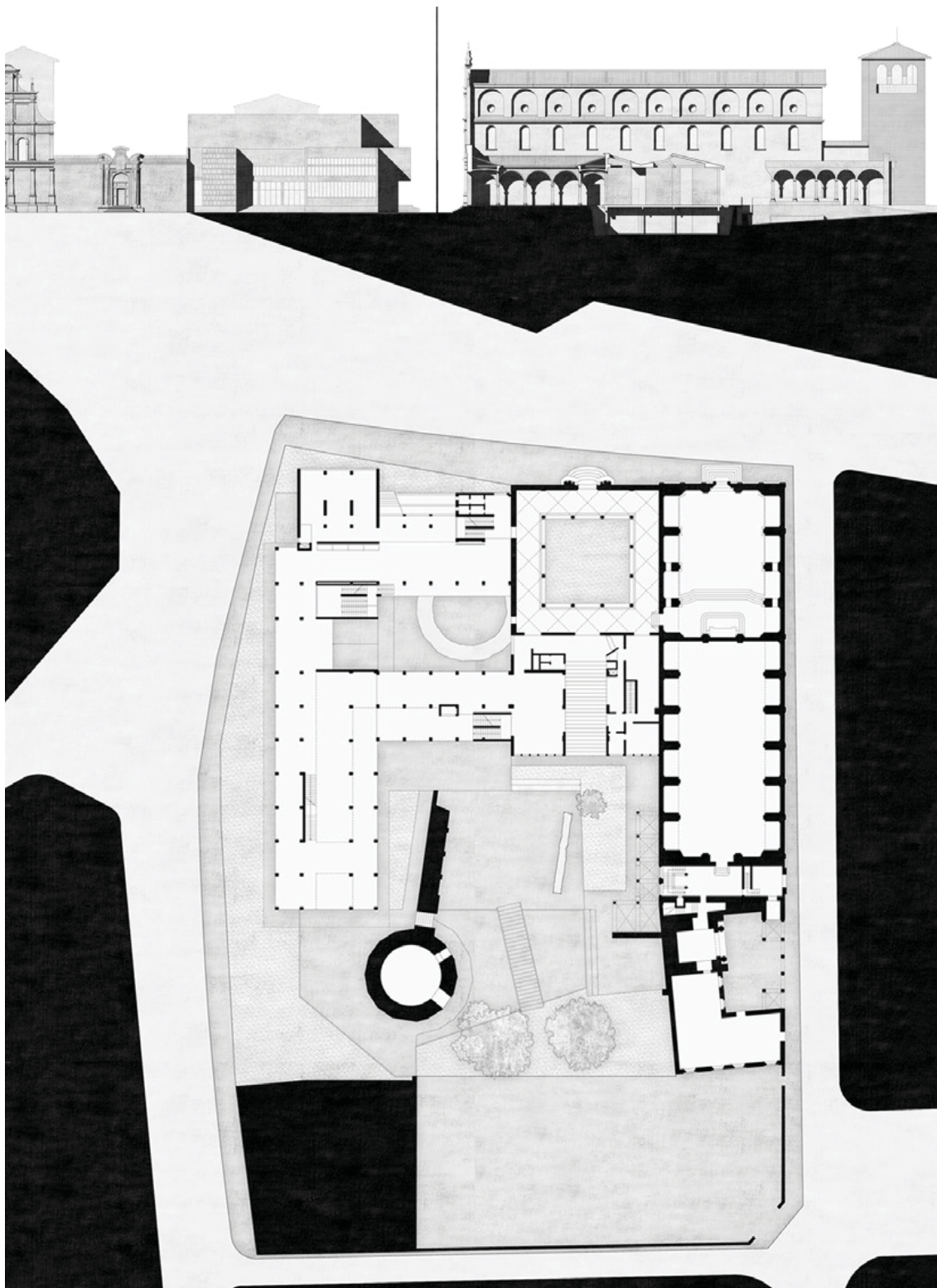
Figure 2. First project hypothesis (1954): new project as a fragment of the history.
Ground floor plan, cross section and elevation on corso Magenta.
Drawing by the author.

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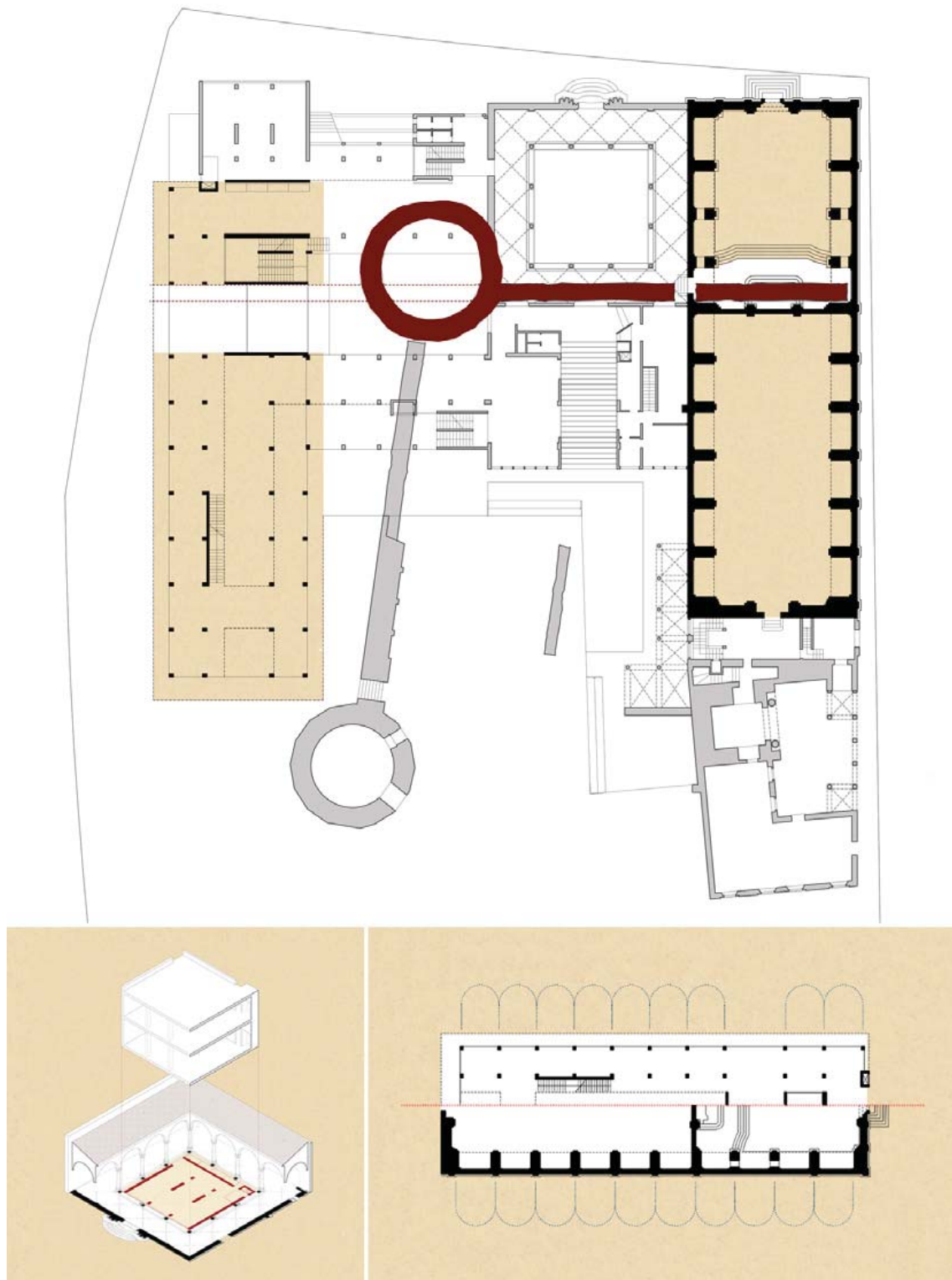
Figure 3. Correspondences and analogies.
Study drawings that investigate the relationship between the 1954 project and the Roman pre-existences of the Circus and the Walls. Ground floor plan, axonometric exploded view and comparison drawing between the Church of San Maurizio and the new gallery. Drawing by the author.
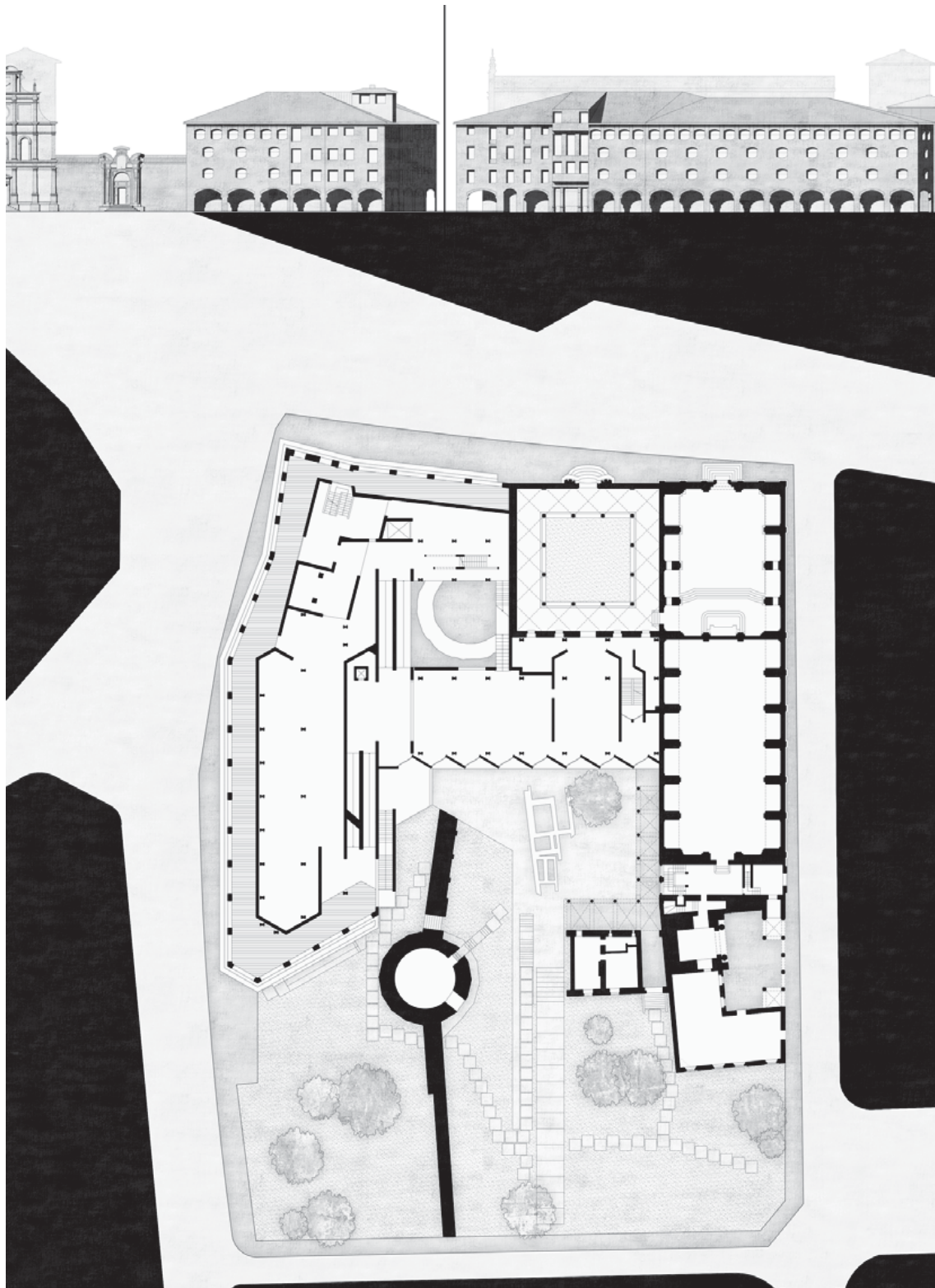
Figure 4. Second project hypothesis (1959-1964): content and container.
Ground floor plan, cross section and elevation on via Nirone.
Drawing by the author.

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Footnotes

[1]The topics covered in this text are carried out extensively in E. Prusicki, 'Milan and the re-invention of the fragment. Towards an Archaeological Walk', PhD thesis in Architectural Composition, XXXI cycle, Scuola di Dottorato, IUAV University of Venice, May 2019, supervisors: P. Grandinetti and G. Marras; tutor: C. Torricelli.

[2]Egizio Nichelli, whose original name is Egizio Heicke, is an architect from Trieste, who moved to the city of Milan at the age of nine where he received his training first at the Academy of Fine Arts and then at the School of Engineering of Milan. Here he graduated in the academic year 1936-37, with Giovanni Muzio. Born on 4th July 1913 in Trieste he died in Milan on 2nd July 1991.

[3]The story of the Civic Archaeological Museum in Milan, began in the second half of the 1800s, when the interest in archaeological pre-existences materialized in official initiatives; on November 13, 1862, the Royal Museum of Archaeology was founded by Royal Decree, thus creating the first public museum in Milan. This is housed in the Palazzo di Brera, in the church of Santa Maria di Brera, then at the Castello Sforzesco, until when, it was decided to give a new home to the archaeological part of the Civic Museums that lay in the basement of the Castle, thus establishing the new Archaeological Museum at the Major Monastery.

[4]The study of the transformations of an architecture is considered fundamental in order to understand the identity of that architecture. Reference is made to what C. Martí Arís deals in 'Variation of identity. An essay on the type in architecture'.

[5]The urban project called "Racchetta" (1953), the "unfinished great", it may be a 30 meters wide track that should have crossed the historic center, renewing its image and functionality.

After the Second World War, Milan was seriously destroyed by the air raids of 1943 and architects are called to affirm and design a new image of the city in accordance with practical and aesthetic needs. The condition of a destroyed city leads the debate to consider central in the theme of reconstruction, both relationship between the invention of modern Milan and the tradition of ancient Milan and the need for the drafting of a new masterplan.

The name of this new track derives from the first version of the layout, which appeared in the 1927 in the *forma urbis mediolani* project, presented by a group of 13 architects including Giovanni Muzio, Giuseppe de Finetti, Ambrogio Gadola and Ferdinando Reggiori in occasion of the competition organized by the Municipality of Milan for the study of a plan for the development and expansion of the city. In 1953 the conditions that had previously led to the necessity and usefulness of the road changed and the reasons proposed in support of the construction of the route are not sufficient to justify the invasiveness of the planned demolitions. Furthermore, the archaeological discoveries play an important role in the decision to abandon the project.

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The city of walls: how military architecture has shaped Baghdad and the citizens

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Abstract

Starting from an overview of "The Magnificent Baghdad" the narrative of "A thousand and one nights" tells the story of a city of controlled spaces embodying an artificial construction. The history of the changing urban and social construction can be read taking the walls as reference objects that can explain how the configuration of the city was reshaped after the conflict. Having this object as a guideline, the focal point will be the comprehension of the main reason that leads to adopting a walled city in modern time. From that, several urban and social questions will emerge. The wall itself is just an architectural element but the use that men made of it can lead to different purposes: if on one side can protect in the other can divide. Struggling with the emerging context of Baghdad how the presence/use/imposition of the new walls affected the citizen and the urban configuration of the city. Action and their reaction on the form of the city will be the addressed point. How the changing of urban configuration changed also the use of the space? Moreover, the subtext takes into consideration the effect of the walling policy in the sectarian conflict and the peace bring promoted by the US maintaining a direct relationship between urban change and political choice.

Introduction: the meaning of a wall

The wall was the first permanent architecture main protagonist the city has seen. More generally it can be intended like an active player inside the process of delimitation and structuring of the physical environment: not just a boundary between inside and outside but also a demarcation line between two separate worlds (Acocella 2006, p.624). The concept of limits became fundamental to understand the dichotomy between inside and outside, divine and profane, between life and death, space known and unknown. The wall is the city in itself (Filoni 2019). As all the architectural elements, during the time, was subjected to an evolutionary process that keeps its function alive. Since ancient times, it was adopted by the city to protect itself from external attacks and afterwhile was transformed in a barbed-wire fence to define an austere setting. The movement inside the city, the trade and the political environment of the country reshaped its meaning (Mohareb 2012, p.2). The wall brings with it the fear and the feeling of a continuous siege. Citizens are protected but at the same time, they can not escape from a fear that cannot be defeated. But if this element can have a meaning during the ancient age or totalitarian periods, what can be the purpose in modern society? It is here that politics come out to reshape the form of the city (Filoni 2019). It is possible to find several studies about the use of the wall, especially in war zones all around the world: the wall between Israel and Palestine, the Berlin wall and the Belfast Peace wall are some of the most relevant. All of them have a common point: to create an impenetrable curtain between two territories in a time of conflict(Murrani 2016). As a case study, the walls in Baghdad, are looking like something different between what was in the past. Now, it is a discontinuous wall that is made by fragments scattered across the city surrounding and dividing entire neighbourhoods from each other, civic buildings and military compounds. The sequence of the events during history led to desertification and destruction of the fortification of the "Circular City" to come back again nowadays with a walling strategy to guarantee order and defence to the citizen. A walling strategy, how Sana Murrani had highlighted in her analysis, "did not only contribute to dividing the city geographically, it also allowed new pockets of social structures with different territorial and political beliefs to emerge"(Murrani 2016, p.4). Moreover, the direct observation of the urban pattern of Baghdad will suggest how an external element, out of the morphological system, can be connected with the actions without causing a modification of the form of the settlements in itself.

History documenting walls

Starting from the foundation of Baghdad, the first fortification wall was erected in four years (762-766 D.C.) to defend the administrative centre with the caliph's domed residence. The city was established around four principal axes with four corresponding main gates: Basra, Kufa, Khurasan and Damascus (Fabrizi 2015). The round settlement was developed inside three concentric walls: the external one was reserved to the fortification of the city and the second contains the residential block dividing the public from the private space. In the communal courtyard shaped in the centre of the circle were placed the administrative building, the caliph's palace and the mosque. The old settlement did not include any recreational spaces, gardens, statues, and gymnasium and public monuments; only the public market occupied the four radial gates (Al-Hasani 2012, pp.85-86). The narrative of "A thousand and one nights" shows the city of Baghdad from the very beginning of its foundation like a city of "controlled space and artificial construct"(Ven Annelies 2016, p. 53). In particular, the history of Al-Tabari indicated what urban planning ideas were at the time emphasising the importance of circularity, order and clarity. The city was a vision of the absolute authority of the Caliph and thanks to the organisation of the space, the strict policing of the street and the occupation of the central square with private government building, the citizen could perceive the social hierarchy (Ven Annelies 2016).

With the increase of population, its boundary became a physical limitation. The space inside the city was not sufficient to supply the new facilities and the housing required for the future population. Moreover, the movement of the market outside the city wall was one of the main cause of the depopulation of the entire settlement (Al-Attar 2019); for

the fear of enemies coming inside the city with the commercial trade, the arcades of the gate were transformed in barracks used by the police and the horse guard (Le Strange, 1900). The active function disappeared from the gate that remained for a certain time just the place where the fear could come in. The city started to expand behind its walls with an urban sprawling on the other side of the Tigris river; different quarters were founded, and each one has its market, mosque and institutions. Just a bridge connect the Old Baghdad with the new enlargement; the city centre was moved again, and a new palace was built near the river surrounded by half-circular wall to protect the institutional power of the caliphate. In that period, another expansion took place, and to defend the urban area from external incursion, other walls and moat were raising. The city kept its structure and walls until the end of the 19th Century (Al-Hasani 2012, pp. 85-87). In the middle age after years of civil wars, natural disaster and Mongol invasion, the city was described by the German traveller Leonhard Rauwolff as a "lum-like streets, with ruined buildings and a lack of western defences" (Ven Annelies 2016, p. 57). Just with Mamluk governors, Baghdad growth again: he rebuilt the wall all around the area destroyed by the conflicts. Despite the several invasion in the 17th century, during the Ottoman Empire, Baghdad preserved a quadrilateral wall with four gates: Kawartha Gate, Muatham Gate, Wistani Gate and Talsam Gate. The commercial street was located near the administrative centre, the citadel, where the distribution of the housing was mixed between different ethnic groups of Christians, Jewish and Muslims (Ven Annelies 2016, p. 57).

The city walls were demolished just in 1870 when the city developed from a medieval fortification to a modern settlement. The urban strategy changed with it: a defensible space became a centre of production and consumption where the economy and exchange relation became the first engine of modern society. The industrialisation of the 19th century leads with it a rewriting of the Arab city and society following the new western value. Transports and communication became essential to build stable foreign relations. In the 20th century, the ancient wall was just a memory and the main developments were concentrate into a re-modernization project to ensure a more accessible city with open spaces for the new citizen: transportation systems were elaborated, streets were opened, bridges were built, and public squares were incorporated into the urban fabric (Ven Annelies 2016, p. 57).

Geopolotical contest: walls against who?

During the last fifteen years, Iraqi society was a spectator of socio-cultural transformation in which religion and sectarian identity assumed a particular relevance (Al-Qarawee 2013, p.2). Considered as the nerve centre inside the Arab World, Iraq and his capital Baghdad, are sandwiched between some of the higher powers: Saudi Arabia, Iran and Syria. Since its foundation, the country had played an important economic and political role inside of Middle Eastern societies (Galoppini 2017, p.7). Already from 1963 to 2003 and especially with the govern held by Saddam Hussein were placed restoration of the Iraqi society. The ideological construction of a Baghdadies identity during the 1980s was primarily influenced by a culture of war and personality cult. The society had to deal with the imposition of the Islamization with Sunni Muslim influence and religion starts to have more importance inside the community. As a consequence of the political sphere and the inclination in the direction of the Sunni side of the government, sectarian violence, most of them led by the party itself, start in the city of Baghdad. In 2003, with the toppling of Saddam Hussein, the invading troops coming from the US to disarm the Iraqi army and the emersion of socio-cultural factors raised a new power in the form of "sub-state sectarian political identities". At the same time the policy carried out by Bush to re-establish an organisation inside the Iraqi government ended along with a sectarian and ethnic division; in fact, the model imposed by the US after the occupation was based on "ethnic majority" in which ethnicity, religion and sect became the basis for political representation. All these reforms were followed by a big plan of "state-building" in Iraq: the democratic change promoted by the US was focused on building institutions along with sectarian parties. Under the new system, state organisations, ministries and small directorates were distributed among sectarian alliances and the positions were parcelled out to Sunni, Shia,

and Kurds. In the end, the strategy of reorganisations of the New Middle East was not working in favour of the Iraqis. The new institutions were not able at all to represent the needs of the population, and on the contrary, the effort was concentrated in increasing sectarian preferences used their position inside the government to benefit personal sect or ethnic group (Al-Qarawee 2013, pp. 2-5). At the end that was not a solution; the division increased the instability not only inside Baghdad but inside the entire country. As a consequence, the second generation of Al-Qaeda, led by Abu Musab al-Zarqawi, today knew as ISIS, used this frangent to seep inside the system having as support point the Sunni community, longer marginalised and disempowered after the fall of Saddam. Starting from 2004 many attacks against Shia carried out (Dawood 2016, pp. 11-13). Moreover, with the government of Nouri al-Maliki, in 2010, the old policy of discrimination and oppression led by Saddam during its rule emerged again letting the country in a precarious situation. On top of that, the US sanctions restricted petroleum sales and limited the ability to the country to recover infrastructures and services to guarantee an acceptable living standard for the community. Internal discrepancy inside the community and the lack of interest shown by the central government, however, the infiltration of the US in political affairs, increase the discrimination and marginalisation inside the society. A new wave of sectarian conflict between the Shia majority and the Sunni minority stepped again inside Baghdad(Galoppini 2017, p.29).

The new walls

Following the overthrow of Saddam Hussein, the nature of violent conflict in Iraq evolved from an insurgency against the interim US-supported government into a sectarian civil war, pitting the country's minority Sunni population against the majority Shia. The old city of Baghdad, one of the most shining centre on the Islamic empire, cosmopolitan and full of culture was the theatre for military operations and terrorist attack and was becoming the city of walls, a mirror of the difficult political situation of the country. Walls between Shia and Sunni neighbourhood, wall to protect the narrow street and wall around mosques, hotels, hospital and following the river to contain the bomb of the IS (Thurber 2011, pp.1-4). The history brings the narratives to the establishment of the US-led Coalition Provisional Authority (CPA) announced as the UN Security Council as the official occupier on 22nd May 2003. It was supposed to be the new central power in place of the Iraqi police and the Iraqi military after the fall of the regime, but the imposition of the new system did not bring good result inside the city. Meanwhile, the US walled off a nearly 10 square kilometres area in central Baghdad to establish the main base of power for the CPA called the Green Zone, the number of looting, kidnapping and the emergence of insurgencies increased leading the city in an escalation of violence. The power was maintained again strongly centralised as the years of "The round city". The Green Zone area occupied most of the southern half of the Karkh District situated in West-central Baghdad that was, at the origin, the base of Saddam Hussein's palaces, government ministry buildings and the official residences of government. With the US rule, the international zone became more inaccessible than with the previous regime, increasing the isolation. In fact, unlike the Red Zone, the Green zone is providing with all the services: own electrical and communication grid, oil supply and an own sanitation system with a fully operating hospital inside of it. Following the walling of the Green Zone, from 2006 the deployment of the concrete walls became a marked feature of the urban landscape of Baghdad. (Murrani 2016, pp. 3-8) The atmosphere inside the city was strictly polarised around the Iraqi government trying to work in favour of the ascendancy of the Shia majority increasing one more time the marginalisation of the minority Shia; all of that made with the support of USA. In this context of tension inside the city, in 2007, the military strategy of selective walling between the neighbourhood was declared as a political decision with the implementation of the Baghdad Security Plan (Almaki 2015, p.19). The first wall, constructed from T-concrete blast wall segments, was built for 5 km long and 3,6 m high to separate the Adhamiya area, a predominantly Sunni neighbourhood, from the surrounding Shiite neighbourhoods (Murrani 2016, p.11). The spreading of the walling policy all around the city change drastically the spatial configuration of the urbanity, the accessibility

and the movement inside the urban pattern itself. The main public spaces, one-time place of recreation and leisure so much to associate Baghdad with the word paradise, were surrounded by concrete barriers to hinder the accessibility and isolate the city core from the surrounding area. As a consequence, gentrification problems increased in all the residential area that was involved in the walling strategy (Al-Hasani 2012, p.89). The people were not easily persuaded by the walling policy and even the Iraqi press and the Prime minister of Iraq, Nuri Al-Maliki objected this decision but with no results. The US, on the contrary, have supported the project added that the primary goal would have been helped controlling access to neighbourhoods. They were transformed into gated communities with control at the entrance with the result of congesting the vehicular movement inside the city. Checkpoints were spreading in all the capital and the inhabitants were subjected to biometric scans every time they entered their neighbourhood or in another. The walls start to assume a double meaning: not anymore just like a manifestation of the sectarian division with the role of obstacle between Sunni and Shia, Muslim and Christian community, but also psychological segregator. The citizen saw in it a meaning between security and insecurity. With the construction of concrete barriers, Baghdad does not trust its citizen, but at the same time, Baghdadi's do not trust it back. A sense of alienation and fear prevails in all the neighbourhoods. The walls were hiding something that can not be seen. This does no more than increasing the insecurity of the citizen due to the high level of surveillance and control of the space around it is not public but only quasi-public. Haifa Zangana, Iraqi writer and political activist, explains the severity of these walls on the city analysing the different name of it: for media purposes, the walls are called "security walls". Outside, most Iraqis on either side of these structures call them "occupation walls", "hatred walls", "sectarian walls" or "segregation walls" (Almaki 2015, p.21). As mentioned before not only the formal configuration of the walls changes during the time but also its perception and its function. Instead of being a wall able to protect the citizen from an external attach it was an artefact with the main purpose of preventing something coming from the inside. The structure of the walls changed due to the change of function and action that had to contain nowadays. Protection has the same meaning but multiple are the differences. For instance, the gate, the main entrance both of opportunity and fear, became an area of fast transition, of waiting but not a space with a proper function where public interaction can arise. The public space inside of each district was transformed in a controlled space where people couldn't feel free anymore besides they were completely safe inside a walled structure. The city was divided in neighbourhoods with a sectarian footprint. The percentage of mixed religious neighbourhood decrease drastically from 2003 to 2007 with the introduction of the blasting policy. Despite the governmental ideology, the citizen had a personal perception of the walls spreading all over the city from the centre to the periphery. As Alexander says from different configurations of elements composing the city followed a different set of action led by the people that are experiencing that space. The responses are strictly connected with the urban element and the configuration of forms; in the case study of Baghdad, the ancient wall with a market placed on both side of the entrance path lead at different human interaction respect a blasted gate. The public environment, how it is perceived by the people and how it is used influences the quality of the city (without going deeper into Alexander's definition) (Alexander 1979). The strategy became soon a lucrative business that saw as principal actors firms in the North of Iraq as well as the US. In fact in 2007 when the construction began, contracted by the Multi-National Forces in Iraq (MNF-I), Kurdistan produced the blocks while the US erected the walls under the protection of mercenary companies. As well the US government intervention in the city included the construction of the wall with the less level of danger associated with it. As a consequence, they were built during the night, and Baghdatis awoke each day with a newly re-configured urban space including new walls and checkpoints.

The unusual condition of Baghdad's walls due to the changing location and sizes of it they fragmented the network of social order established inside the community. The policy of post-occupation segregation increased the division inside the society but in the

long term create a kind of language of acceptance of the precarious condition from the people (Almaki 2015, p.21).

In 2008 another manifestation of communitas came to redeem the city. The main goal was to revitalise the wall landscape of the city by commissioning artists to paint murals on the walls. Despite the initial enthusiasm of the Walls Group, only a few artists expressed their art and their concern freely; in fact, most of the murals were the results of decision-making between the commissioners (MNF-I) and the artists. At the same time, the people tried to retake to themselves the space created by the walls: in some cases, the blast walls have brought back genius loci by recreating pedestrianised areas and no car zones around famous old and traditional markets such as Al-Rasheed Street (Murrani 2016, pp.10-13).

The pattern of action led by the citizen had the aim of resume the ownership of the space. They try every time to keep the pattern of the wall alive, to make it change and to transform it in something that could have to be a function for the community. In this sense, the city had a specific, as Alexander was saying of being alive and transform itself. If this is not going to happen it will die in a stuck structure (Alexander 1979).

Present and foreseeble future

In February 2016, Iraqi officials launched a controversial plan to surround Baghdad with a huge wall and a moat. This time the proposal had programmed to move the concrete walls that had stood inside the city neighbourhood and reuse it to build a wall surrounding the city. Officially improving the security of the capital, this would liberate its main streets by reducing the number of checkpoints and the traffic jams they frequently caused. Just a few months later, in April 2016 through the spirit of the popular protest, hundreds of thousands of Iraqis filled Baghdad's Tahrir Square, demanding "the end to sectarianism" and the establishment of a technocratic government. Thanks to this peaceful protest, the citizens were able to carry out relevant political change for the city (Dawood 2016, pp. 13-15). Nowadays Baghdad is changing: at the beginning of the new years, a new project was signed by the government. According to Saad Maan, the Baghdad Operations Command is carrying out the campaign of removing the blast walls and checkpoints (Rudaw 2019). First of all, the city is being the stage to the lift of the Green Zone after 15 years, a significant urban change that allows the people to move more freely inside the city. Secondly the remotion of some of the wall inside the city centre with the reopening of the 14th of July Bridge. Captain Ghassan Ghani and his team of workers are now working on this project, and over the last year, 35 checkpoints have been removed. Economic aid and funds are being allocated by the new government to rebuild and improve services, infrastructure and housing system inside the city. However, the people are still afraid of terrorist attacks that could be held again inside the city centre, especially after the one in the city of Tall Afar in December 2018. New proposals are being made to reuse the wall and protect the country for the threat of the ISIS: a new defence will be built in the border with Syria (Bulos 2019).

Conclusion

On one hand, the western powers played a relevant role inside the definition of the social and political landscape inside the urban context of Baghdad, but in the other hand also the Iraqi government has had a deep impact in the deterioration of the social structure of the entire country(Murrani 2016).

The history of the walls tells the sharp change of the Baghdadis society. As a walled city could be free in a time of Sultans and could be forcibly restricted in the time of the Republic. In the end, the result of the wall policy in Baghdad leads only sectarian division inside the society without really intervening on the real problem creating just a new stagnation and ambiguity. Instead of solving problems, the government created a freezing condition lasts for 15 years. At the sunrise of the new age for Iraq and Bagdad, the society is in front of a twilight. After 15 years of US invasion, sectarian violence, and uncertain living condition, what has to been rebuilt are not just building and infrastructure. The people themselves are now destroyed. As urgent surgery on the city, the solution proposed

by the politicians will be removing the walls to create another one on the Syrian border that probably will lead to the same situation of insecurity.

Coming from alexander theory, analysing the urban pattern of the city involved in the walling policy it is possible to understand how the imposition of a new element inside the city is influencing the pattern of relationships and actions that were happening in that specific place. However, the urban form of the neighbourhood encloses inside the wall didn't modify its assets. The urban form stayed the same. The investigation of urban morphology, in this specific case, need to address the cultural meaning of the urban form. It is coming from this approach that can be more relevant understand what specific form, and in this case, how specific element are affecting the people and their behaviour (Karl Kropf 2011). Connections between action and forms can overlap the interaction between them. In this contest is automatic open a new questions: the wall as space modifier has different results connected on the pattern of action that is related to it. How much the politics rather than the mere design are influencing the use of the walls can be the right question to take as a basic asset of design in war conditions. What about the state border, how to approach a brother scale of interaction and patterns of events about the quality of the social life and political balance of the region. Politics and the city have a relationship but where the shape can insert is still an open debate.

Figure 1. Plot maps of Baghdad city.

=Shia majority
=Sunni majority
=Cristian majority
=Mixed area
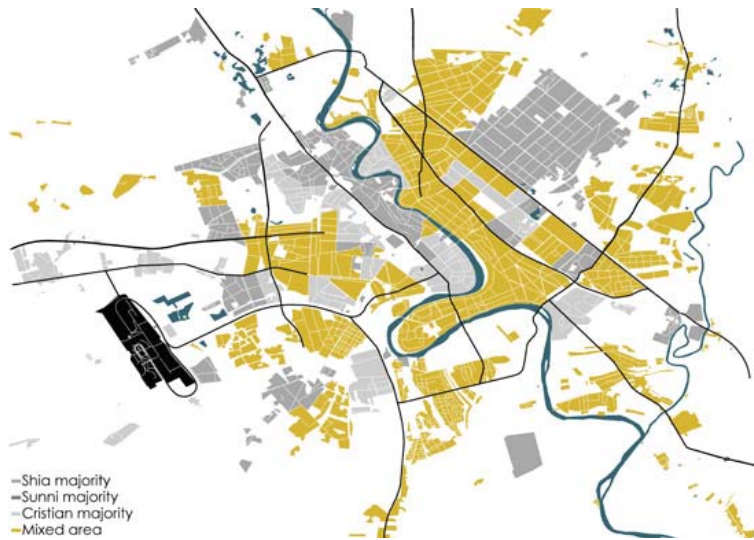
Figure 2. Sectaian subdivision 2003. (re-elaboration from M. Izady maps)

=Shia majority
=Sunni majority
=Cristian majority
=Mixed area

Figure 3. Sectaian subdivision 2007. (re-elaboration from M. Izady maps)

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URBAN SUBSTRATA | Morphological legacies
& and
CITY REGENERATION | design tools

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Layered Morphologies and Topographic Structures. Substrata, Assemblage and Design Writing

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Keywords: layered topo-morphology; assemblage; topographic forms; architectural rewriting

Abstract

Considering the site as a 'tabula plena' rather than a 'tabula rasa', design is in no case the colonisation of a void but rather a new writing on an existing text, often miscellaneous, that requires to be red, interpreted and consistently continued. This knowledge posture deriving from the Italian tradition of urban studies and urban architecture manifests a tendency towards continuity that, although manifold and originally in either opposition or in continuity with the Modern Movement, firmly relates architecture to the meditative thought which produces advancements through a continuous reflection on previous ideas and physical 'substrata'.

After establishing an 'urban science' based on the typomorphological bi-univocal relationship, analogic transpositions in urban discontinuity, 'città per parti', and first inquiries in the territories of topologies, present interpretations underlying the notions of layered palimpsest, stratigraphic readings and substrata, reinforce a tendency in which architecture and the city are mutually defined.

The concepts of layered morphologies and latent topographical structures form a conceptual device that challenges the condition of the city as assemblages of assemblages, operating on the degree of integration or dispersion of its components, the decoding of latent structures and traces, the readability of morphologic-semantic units and rewritability of superior-grade figures.

In Chinese contexts, where historic space is often the space of latency under multiple incoherent texts, simply juxtaposed, the hermeneutic work of decoding and recoding acts as a carrier for constructing a contemporary cultural relationship with the site by stirring a multiplicity of meanings and resonances that enriches both situated memory and the narrative introduced by the new work.

Advancing critical-theoretical propositions while verifying their operational tool through research-based case studies, the paper explores some principles for reading, decoding and interpretative rewriting in multi-coded compromised Chinese historic sites: re-signification, re-structuring and re-morphologisation.

The Spatialisation of Temporal Dimension

When the site is considered as a *tabula plena* rather than a *tabula rasa,* design is in no case a self-referential colonisation of a void but rather a new writing on an existing text, often miscellaneous, that requires to be red, interpreted and consistently continued or transformed.

Occupied sites contains not only built structures, i.e. building types and their tissues, but also imprints, crop marks, fragile traces, hidden *substrata*, fragments, incongruous alterations and significant debris.

This knowledge posture, stemming from the Italian tradition combining urban and territorial typomorphological studies with *urban architecture* (Rossi, 1966), manifests a tendency towards continuity that, although manifold and originally in either critic opposition (Muratori, 1963) or in rifondativa continuity with the Modern Movement (Rogers 1957, Samonà 1975), firmly relates architecture to a humanistic meditative thought which produces advancements through a continuous reflection on previous ideas and physical *substrata*.

Since the 20th century, academic circles have questioned various theoretical models and their closely related *continuity* (Foucault, 1969). Al centro dell'articolata riflessione degli architetti sono i principi su cui si basa la definizione della forma architettonica e della città, del territorio e del paesaggio come luogo dell'architettura.

After establishing an 'urban science' based on the typomorphological bi-univocal relationship (Muratori, Aymonino, Canella, Rossi, among others), analogic transpositions in urban discontinuity (Polesello), *città per parti* (Aymonino, Rossi), and first inquiries in the territories of topologies (Gregotti, Secchi) and *ground writing* (Purini), an interpretations underlying the notions of layered palimpsest, stratigraphic readings and *substrata*, can update and reinforce a tendency in which architecture and its settlement forms are mutually defined.

Beyond significant differences in theories and methods, we can maintain the recognised relationship between knowledge and design (research-driven design joint to research-by-design), that subverting conventional functionalism and usual disciplinary fragmentation has affirmed that programs and themes need to be defined starting from the character of the site.

Understood as a context that is culturally and historically defined, it brings in foreground architecture and urban or territorial forms as an historic-cultural '*mise en forme*'.

In many contexts, from archaeological to severely compromised ones, the metaphor of the palimpsest (Geddes 1915; Corboz, 2001), supplemented by a deep stratigraphic reading of the *substrata* (Strappa, 2018), must further include the concept of *latent structure* (Pezzetti, 2019), understood as a system of physical or intangible *lines of force* that presides over the constitutive reasons of settlements. At the same time it evokes a deep and resilient order, hidden under apparent chaos, and an *absent form* that the project has the responsibility to unveil.

Differentiating between the notion of *substratum* (from *sub sternere*, to spread beneath) and ruin (from the Latin *ruere*, to collapse) (Strappa, 2018), we can consider preceding layer as a foundation for the overlapping of a new organism, or in philosophy, the sub-stantia forming the essence of a thing.

History takes place in time but also in space. The notion of memory is associated to places within which it has been produced and continue to witness the event through time.

As pointed out by Freud (1930), who compared human memory to Rome as a palimpsest city, borrowing from archaeology the metaphor of sedimentation, physical traces only rarely disappear unless abrupt events occurs, but even so people would rebuild along earlier tracks.

Exploring the notion of *substratum* within the theoretical dimension as well as design work, we can discriminate three meanings that in their complex interaction support or alter the previous layer from the within and without.

Physical *substrata* may correspond to the spatialisation of the temporal dimension which is crucial to recognise the order of superposition. The archaeologist's method

offers consistent tools to architects because differently than the historian's, the temporal dimension of time is 'spatialised' since anteriority and posteriority derive from strata of sedimentation.

Foucault (1969) introduced archaeology as an analytic method to better comprehend any system of thought that would not build linear narratives of progress. Its comparative approach was never addressed to reduce complexity to a single unit but rather it worked with fractures and discontinuity.

Nonetheless, while the archaeologist works separating the physical strata accumulated horizontally, the architect works by superimposing layers, organised both horizontally, like the Bramante's sketches for St. Peter, and vertically like Alberti and Palladio.

Substrata can be also intended as latent structures that although buried or disappeared, are still underlying imprints providing meaning to urban form.

Finally, intangible *substrata* refer to the reference to previous ideas and architectures that through an analogic procedure support something yet to come. The architectural work is 'a single of many', unique and made of others architectures at the same time.

Layering Process and Assemblage Thinking

In linear developments, the layering process may inherit features from previous strata, each one modifying and being modified by the new additions.

Nonetheless, during historic cycles and rapid development, the layering process may suffer violent rifts and fractures or experiment the grafting of new *force-ideas*[1] dove, più che alla continuità morfologica dei tessuti, la continuità attiene innanzitutto a structural reason and to the *substratum* formed by segni topografici incisi sul suolo dalla struttura urbana precedente o nella profondità dei tracciati archeologici. E' il caso paradigmatico del Foro Antoliniano a Milano o del Prato della Valle a Padova.

Soprattutto a partire dalla città moderna, l'accostamento paratattico di morfologie disparate, infrastrutture, e brani di natura antropizzata, rende difficile pensare in termini di continuità secondo un modello necessariamente univoco e filologico.

Experimentation derived from Postmodernism culture have already dismantled simplified linear-causal narration in favour of collage narration. Under the guidance of a predetermined theme, the text is investigated, classified, analysed, deconstructed, and re-narrated.

The last decade has seen an increasing interest in the application of *assemblage thinking,* in geography, sociology and urban studies.

Critically exploring the complexity of the society through the multiplicity of *assemblage thinking*, il recente testo di DeLanda (2006; 2016), debitore dei precedenti studi di Deleuze and Guattari (1987), sembra infatti riportare l'attenzione su un'ontologia che appartiene alla cultura del progetto: la città come assemblaggio.

Sotto le diverse declinazioni di *city of composite* or collage (Kollhoff; Rowe 1978), montage ('Roma interrotta', Città Analoga) il concetto di assemblage ha variamente attraversato la composizione architettonica per ricondurre a senso anche il caso e l'imprevisto come elementi di arricchimento. Del resto la strategia dell'assemblage e delle procedure ad essa sottese ha già dato ampie prove di sperimentazione quali Villa Adriana e la Bank of England di John Soane (Pezzetti, 2014) tra tutte.

Critically exploring the complexity of the society through the multiplicity of assemblage thinking, the recent text of DeLanda (2006; 2016), indebted to previous studies of Deleuze and Guattari (1987), brings attention to an ontology that has a long belonging to the project culture: the city as an assemblage. Under the different variations of city of composite or collage (Kollhoff; Rowe 1978), montage ('Roma interrotta', Analogue City) the concept of assemblage has variously crossed the architectural composition to make sense out of the unexpected and chaos as enriching elements. Besides, the strategy of assemblage and the procedures underlying it had already ample proof in historic precedents such as Villa Adriana and the Bank of England by John Soane (Pezzetti, 2014) among them.

Already in the early 1980s the city appears as 'a vivid set of pieces and fragments, of types and countertypes, a juxtaposition of contradictions, a process more dialectical than linear' (Ungers, 1979).

Moving from the multiplicity and complexity of contemporary society, the assemblage thinking has recently been relaunched from relational theories transposed to the study of urban form, informing the theme of the 2019 ISUF Conference 'Cities as assemblages'.

The meaning that the original French term '*agencement*' possesses, refers to the process of matching together a set of components and not just its result. Unlike collage, in fact, we can read in the assemblage procedures a structuring intentionality that the operation of the bricoleur does not possess. Transposed into architectural culture, this is evident in the different procedures implemented by Stirling in the plate for the exhibition 'Roma Interrotta' and Khollhof in the collage included in Rowe's Collage City (1978). Onto the *tabula plena* of the Nolli's map, Stirling grafted skilfully a new layer made of projects adjusted to interpret and continue the underlying urban structure; Khollhof, instead, collaged on a blank slate a Piranesian gemmation with only monuments.

The assemblage of layers leads therefore to an evolution of concepts and tools that includes the possibility of interpreting also the warps of the settlement. At the same time, it enhances *in situ* spurious elements as part of a concept of coevolutionary development and resilience of *built facts*, redirecting their transformations.

Typical warps are overlaps of unfinished or dissonant structures and incoherent morphological wreckages that constitute, on the whole, a fragmentary and no longer univocal text that requires hermeneutic interpretation and recoding for the purposes of its re-signification.

Layering becomes a reading tool and design action at the same time, which will become part of the assemblage in its own right.

Layered Morphologies and Topographical Structures

We can think of Continuity as the link between heritage, time and society.

It is therefore necessary *invenire*(from Latin, to discover or invent) more complex forms of continuity and formation of meaning employing different codes by crossing physical *substrata*, essential when existing, with intangible ones when lost or entrusted to memory in a de-spatialized historical space, as in the case of China.

In the Chinese settlement forms, exemplified by the two cases here reported, a different notion of achronic and circular time has historically led to a continuous cycle of substitutions and demolitions without, however, invalidating an idea of continuity based on the prescriptive value of the antecedent. Continuity was ensured by the timeless essence of symbolic structures and archetypal forms rather than safeguarded by the permanence of physical substance and *auctoritas* of *spolia* and subtrates (Pezzetti, 2017).

In a cultural framework in which Chinese architecture is not allowed to show the signs of time and the ruin, with all the evocative force of its mysterious erosion of time, is absent in the city, the intangible or material memories of the archaeological *substrata* and fragile topographical traces most of the time are the only support to give the disembodied history and despatialised rich literary memory a physical substance and *mise en forme* (Pezzetti, 2019).

Therefore, both physical aspects informed by the *substratum* (unearthed or underground remains, matter and materials) and intangible aspects (latent structures, urban form, archetypes and cultural narratives) need to be jointly considered in the hermeneutic work of reading, decoding, and recoding and in respect to the role interpretative design plays in forming a space for cultural communication.

How we identify urban structural and morphological characteristics and how we understand the formation and transformation of urban forms is essential for the conservation and revitalization in historical cities.

Historical awareness is neither a neutral accumulation of data nor an assessment of fatally transient values. In planning all too often it remains at the level of dating and describing individual features (Whitehand, 2007) . The relation between facts and the modes of description are themselves the method.

The UNESCO's dynamic rethinking of urban conservation principles and paradigms (Bandarin, 2010) launched with the Historic Urban Landscape approach (2011), should adopt sound methods related to historic-structural and typomorphological studies in

JANFU TEMPLE LAYOUT EVOLUTION

Janfu Temple in Tang Dynasty
(707-907)

Janfu Temple in Ming Dynasty
(1368-1644)

Janfu Temple in Qing Dynasty
(1644-1912)

Janfu Temple in Republic of China
(1912-1949)

Janfu Temple Current Situation
(1949-Present)
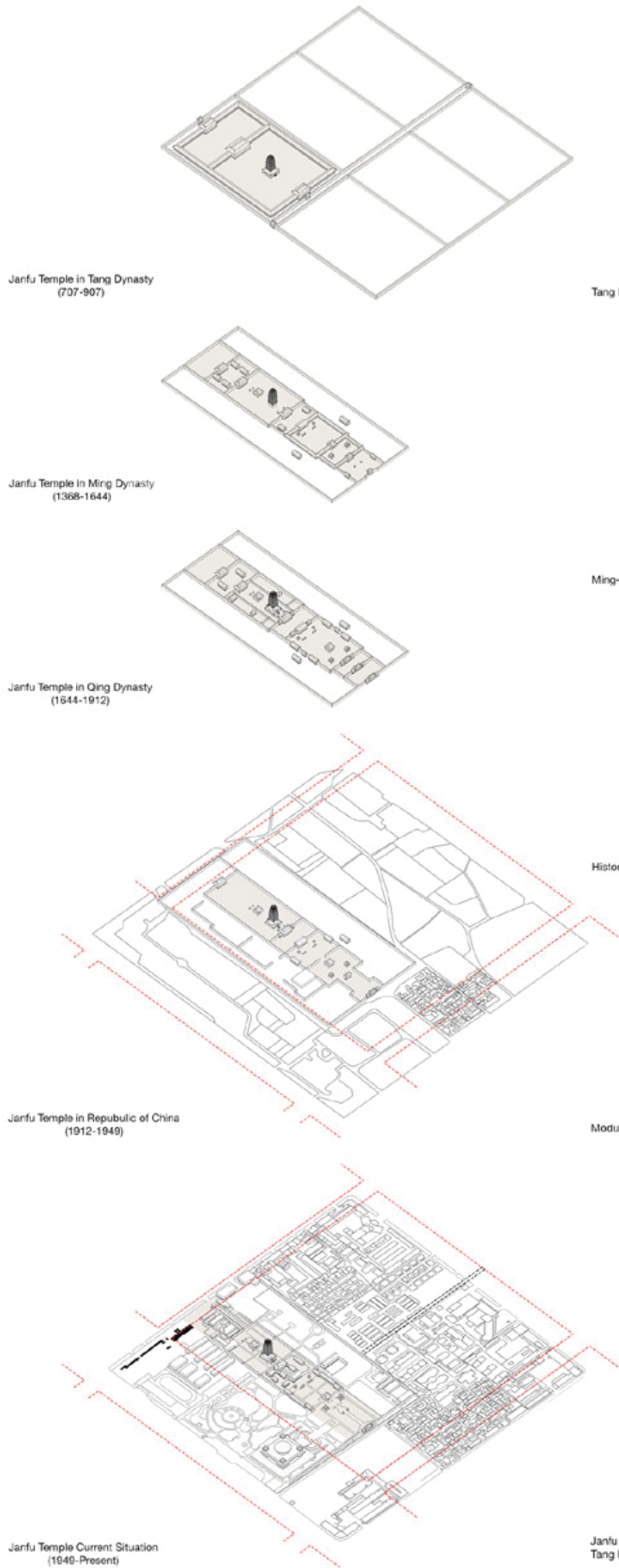
JANFU TEMPLE LAYERS IN PROJECT DESIGN

Tang Layout Layer

Ming-Qing Layout Layer

Historical Area Sequence

Modulus of Zhuque Avenue

Janfu Temple and Xiao Yan Ta in
Tang Dinasty (707-907)

Figure 1. Xiaoyan Ta Pagoda: sequence of the historic stratigraphic layering in the Pagoda and Anren block flanked by related interpretation in a design proposal.

order to define the object and the boundaries of conservation areas through adequate understanding of settlement facts and their underlying formal structures. As well as the new layers to come, signs of the future that will be part of the layering *assemblage*.

The study of the process of layering morphologies and topographical structures can make significant contribution to the conservation of historic parts of urban landscape now considered as 'tangible' heritage, together with its associated intangible memories.

The first theoretical and operational shift is to redefine the concept of 'setting' and 'assessment' as 'context' and stratigraphic reading.

The notion of 'setting' contained in the ICOMOS China 'Principles' (2015), together with the mere hint to 'natural landscape and surrounding environment' in the 'Regulation' (2008), are actually undefined references lacking appropriate knowledge tools that have, instead, a long tradition in morphological urban studies. They are insufficient to decode, along with style and vernacular traditions, the settlement matrixes and their underlying formal structures, which are crucial to understand the relation between single building types and their settlement or landscape forms, providing a scientific and cultural foundation to the knowledge project of the entire organism. Besides, 'assessment' is mainly referred to values, which are transient and unrelated to the complex reality of built organisms.

The structural and historical notion of context allows penetrating the deep structure of settlements where the place, rather than the visible hic et nunc, is the result of a dense texture of signs and relations, fractures and oppositions that are forms, ideas, memories and absences the decoding of which takes place first of all (but not only) within the layered text that is the site (Pezzetti, 2019 b).

This legacy constitutes the reference framework also for the dialectical relationship between old and new, i.e. between the pre-existent to be conserved and design as the authentic form of its enhancement.

Therefore, place-as-a-context is also an absence, and a possible text that, similarly to a palimpsest contains several traces and different signs including the future ones (Pezzetti, 2019).

Absences, in fact, are never entirely disappearances, as they leave traces in the deep memory of places. In the case of an absent form (Eisenman, 1983), what matters is precisely the str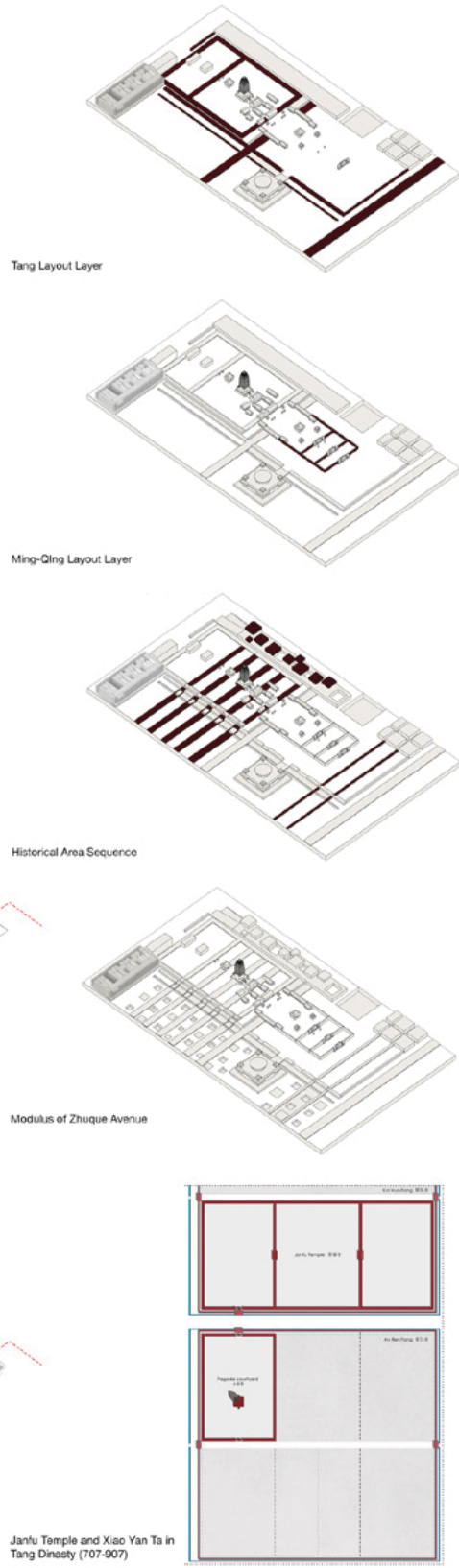ucture that underlies and makes it possible. This concept has proved to be effective in the Chinese context where latency, disappearance and intangibility all too often open the path to demolitions, substitutions or simulacra (Pezzetti, 2019).

Therefore, if the concept of context as a layered palimpsest allows reading morphology and topography as a continuous recording of signs, what our knowledge of the context is made of becomes a crucial issue.

The second shift is that research has to transcend some usual spatial ontologies such as architecture/planning, preservation/design, urban/rural, developing a multiscale approach integrating theoretical and methodological tools.

The conceptual device of layered topographic structures and morphologies has been developed as a theoretical and methodological approach to investigate the coevolutionary nature of architecture and settlements (Pezzetti, 2019).

Promoting a renewed notion of built heritage as historicised architecture and of landscape as a structure of structures, the dialectic conservation-modification is investigated from the recognition of pre-existent signs, or formal orders, typomorphological structures and topographical writing of the ground. Besides, challenging the condition of the city and of most historic spaces as *assemblages* of assemblages, the concept operates on the degree of integration or dispersion of its components: the decoding of latent structures and traces to reveal the intangible heritage of urban form, the legibility of its semantic morphological units and their architectural rewritability as *superior-grade figures*.

Verifying the operational value of its critical-theoretical propositions in both urban and rural Chinese contexts where latency, disappearance and intangibility, combined with the lack of morphological studies, too often open the path to extended demolitions, simulacra reconstruction and incongruous development, the methodology has revealed an effective reading and the potential underlying those settlements forms.
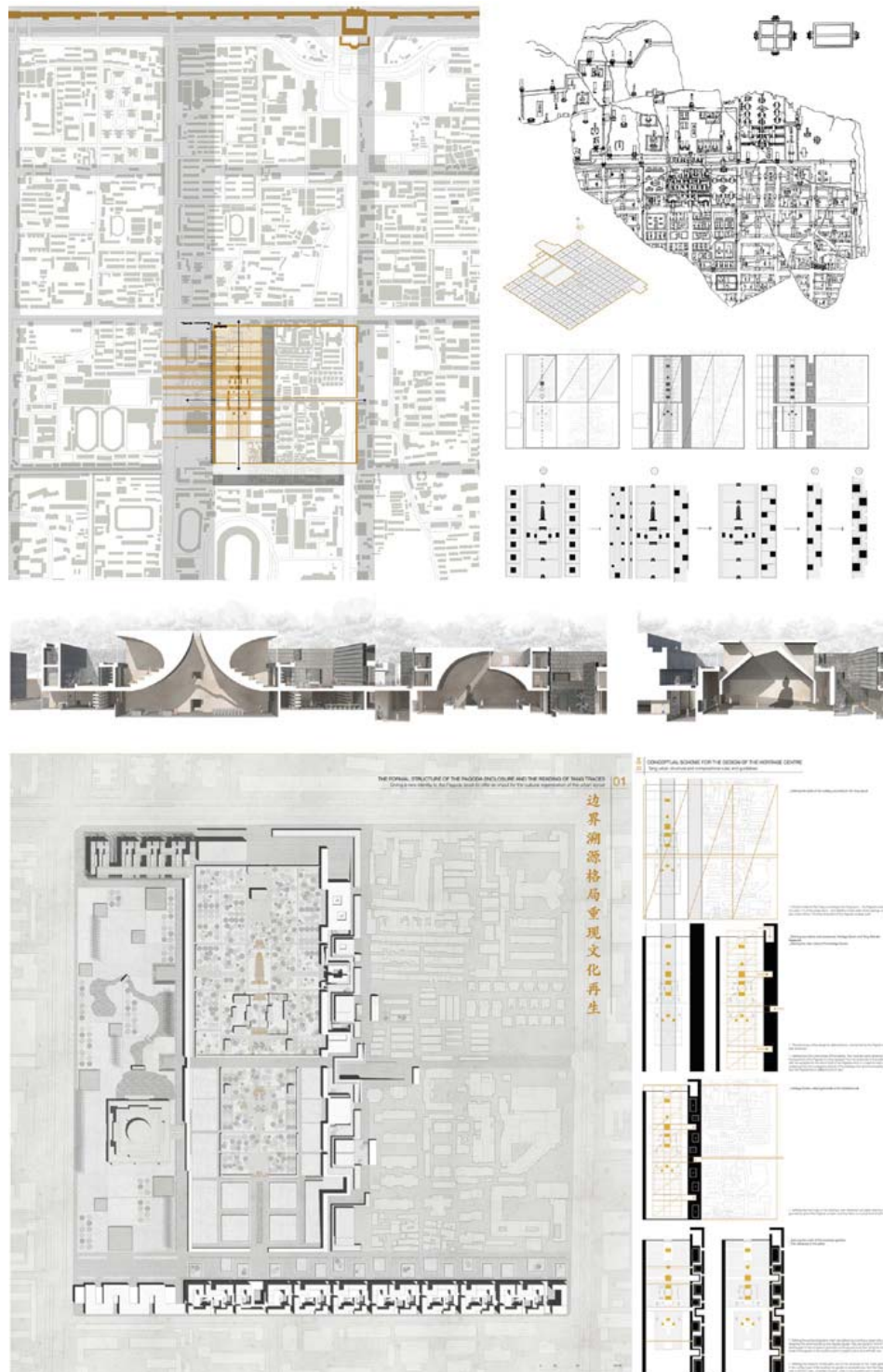
Figure 2. Xiaoyan Ta Pagoda: **2.a.** interpretative diagram of the Anren Li Fang, Pagoda, and Tang axis, in their interrelation and urban role in the present Xi'an, showing the Tang grid overlapping on the blocks defined by the 1950's masterplan; **2.b.** Lu Dafang's map, redrawn after the stele fragment with two types of *li fang* and a graphic reconstruction of the Tang City's layout; **2.c.** Anren Fang's Tang structure, evolution, and design interpretation; **2.d.** diagram of the ideal type of the Pagoda (0) compared to the strategy for the Tang axis (1) and Pagoda's west boundary (2); **2.e.** Design project for the protection and regeneration of the Pagoda and Anren block; section through the Heritage Center defininig the Xiaoyan Ta's east boundary and diagrams of form's definition.

The paper presents two historic sites in Shaanxi where the superposition or simply juxtaposition of multiple texts and incoherent fragments, apparently deprived of any reference to previous *substrata*, is brought to extremes.

The former, focussed on the UNESCO Xiaoyan Ta pagoda[2] (707-710 A.D.) built in the ancient imperial capital of Xi'an during the Tang Dynasty (618-907 A.D.), demonstrates the potential operational role of urban underground *substrata* in providing meaning and a physiological continuity to existing and new layers to come, through the prevailing issue of the latent structure relating to a single typomorphological principle. The protection of the UNESCO site results indissoluble from the interpretation of the entire Tang block, the Anren Li Fang (Fig.1-2).

The second, focussed on Fenghuang[3], an old town included in the list of 'Famous Historic Cultural Towns' (2010), that still features late Qing Dinasty courtyard architecture and some physical remains of its constitutive matrix. Its discovery has unveiled the indissoluble interaction between an original morphotype, a latent radial topographical structure, and the geographical character of the valley, thus providing ascertained principles for organic strategies of re-morphologisation and re-signification reconnecting old and new (Fig. 3-4).

In both cases, the investigation of the layering underlying the *assemblage* has revealed latent resistant structures that clarify the urban process of evolution. Although fragile, those signs of persistence are culturally meaningful and offer clear operative principles for unveiling the hidden orders that support spatial and architectural interpretation.

Another foremost outcome is that in the case of Fenghuang the reading has also provided vernacular Feng Shui and Shan Shui principles with an extrinsic and fully expressed spatial form.

Continue to Write: The Issue of the Absent Form, Latent Structure and Despatialised Memory. Two Chinese Case Studies.

As the time is spatialised in layers, architecture as archaeology becomes interpretative. The prospect of working within layering becomes constitutively hermeneutic.

The reading of the two case studies has produced a new interpretation of their existing and latent texts which have been recreated from the hermeneutic point of view as a 'rewriting'.

In Chinese contexts, where historic space is often the space of latency under multiple incoherent texts, simply juxtaposed, the hermeneutic work of reading, decoding and recoding acts as a carrier for constructing a contemporary cultural relationship with the site through design. Stirring a multiplicity of meanings and resonances the relationship enriches both the situated memory and the narrative introduced by the new work.

Re-coding implies interpretation. For interpretation to be valid and not to improperly 'overinterpret' the text, it needs to be latent in the text (Eco et al., 1992).

The re-signification project reintegrates a fragmentary incomplete text prefiguring new signs, insertions and overwriting according to its structural laws. The studies on the structure and urban form *substrata* provide solid method and tools to define what we are trying to preserve, enhance, and eventually develop and the foundation of a site specific strategy.

As a result, the project itself is the palimpsest when based on the relation among past, present and future across the layers.

The interpretative design based on latent structures rewrites the order of relations in the layering of both physical and mnemonic historic space, redefining the interaction of the main components: settlement structures, types, morphologies, form of topography and form of the void.

The underlying structure therefore reveals the absent form which is the very object of research, exegesis and design interpretation. The place therefore is also an absence and the possible text containing different traces and signs, including the future ones.

By following the latent *lines of forces*, 're-coding' reconnects what has now become intangible to its physical *mise en forme*.

As the site is the real generator of a joint conservation-rewriting strategy, the programme and the construction of design narratives infuse past ones with new meaning.
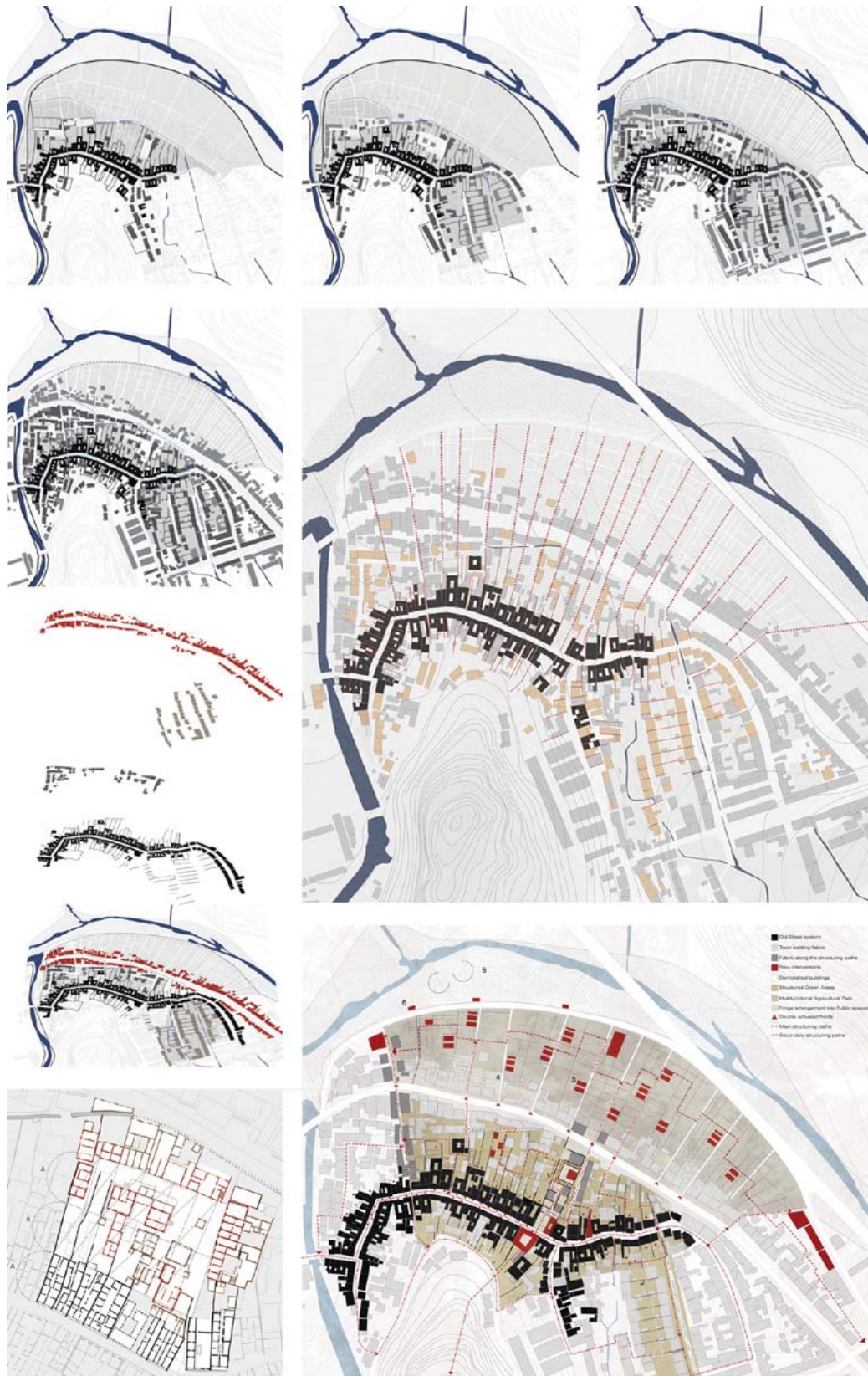
Figure 3. Fenghuang: 3.a. sequence of stratigraphic layering in diachronic and synchronic historic sections showing four rural-urban structures; 3.b. superposition of the old radial latent structure; 3.c. synchronic stratigraphic layering in one morphotype; 3.d. plan-project and enhancement strategy.

The tool of stratigraphic mapping, by investigating the site in its diachronic construction and synchronic reading, has revealed in both case studies a deep-seated urban order that can be still traced back to regenerate not only the key conservation units and their buffer zones, but the overall legibility of the *li fang* block[3] in Xi'an as an urban part, and the entire urban form in Fenghuang as an organism (Fig. 2.a; 3.a-b).

The UNESCO Xiao Yanta and Tang Anren block, which formed an ideal but abstract *substrata* in the First Masterplan in the 1950s[4] evoking the grid of the Tang capital, can be interpreted as a semantic unit and by four major diachronic components:

1. The 200 metre-large void showing the only perceivable fragment of the Tang Imperial Axis, which structured the order of *li fang*'s typomorphological enclosures and emerging cultural buildings, like temples and pagodas. Interpretative layout suggests keeping this void unbuilt as a green area, equipped possibly underground, showing the boundary of the pagoda enclosure and prolonging its traces towards the city wall as a cultural axis[5](Fig. 2);

2. The geometric order established by the unearthed or potential underground remains of the walls system in Ri-type *li fang* and *zhai* (its inner subdivision), traceable through the intrinsic logic of infographic materials, such as the Lu Dafang's stele fragment (1080)[6], Zhang modules, maps, aerial pictures. It suggests redefining the boundaries of the ancient morphotype by interpreting them as 'inhabited wall' to protect ruins or house cultural programmes and reintroducing the moat. The present asymmetry in the eastern boundary can be interpreted as the ideal type's lateral sequence of courtyards to connect the UNESCO site to the fabric (Fig.2.c-d);

3. The Pagoda, that once was part of the disappeared Janfu Temple, and needs to become again readable in its enclosed character and layering of boundaries by interpreting the rhythms established by halls and gates;

4. The disparate 'collection' of modern morphologies is a record of concluded historic cycles and a low-rise variety of types which is hard to find in the 'generic city'. Specifically, the urban village just demolished presented ancient patterns and traces consistent with the *zhai* modular subdivision. Although unrecoverable, they should be assumed as a physical and mnemonic *substrata* for the current redevelopment (Fig.2.e).

Unlike cities, the form of Chinese villages still retain types, landforms and writings of the ground – whose anamnesis and interrelationship would reveal their constitutive rules and co-evolutionary character, thus opening a new approach for both conservation, enhancement and development (Pezzetti, 2019).

Through a hermeneutic reading, based on the interrelation of topographic signs with material and typomorphological survey along with diachronic stratigraphic mapping (Fig.3.a), a latent structure emerged in Fenghuang. Orthogonally to the winding association of courtyard *zhai yuan* houses along the Old Street commercial road, now forming the key unit of adopted conservation plan, a perpendicular latent structure was discovered, linking in a triple relationship type, morphology and agrarian fields' structure (Fig.a-b).

The correspondence between building parcel and building type generated an original radial strip structure converging on the top of the upland of the Ying Pan Hill where the ancestors recognised in the village form the deployed wings of the flying Phoenix (Fenghuang). The structure defined the whole settlement, stemming from the plot of the *zhai yuan* narrow courtyard houses, stretching to the backyards and vegetable gardens, continuing as far as the fields' *strigatio*[7] down to the riverbank wall where it finally opened like a fan and reverberated in an ideal triangulation with the mountains' peaks (Fig.3.b).

The structure clarify traditional topological principles of Feng Shui and Shan Shui, enlightening them for the first time with a describable *topographical figure* and urban form.

The void is the essential field on which these *lines of force* establish the relationship between mountain and water, similarly to Chinese painted landscapes where invisible lines that underly things establish their mutual relationship (Cheng, 1979).

This meaningful urban-rural whole is the very text to be understood, preserved and coherently enhanced for the future in relation to which the multiple issues of preservation, revitalisation, design enhancement and development need to be jointly redefined (Fig.3.c).
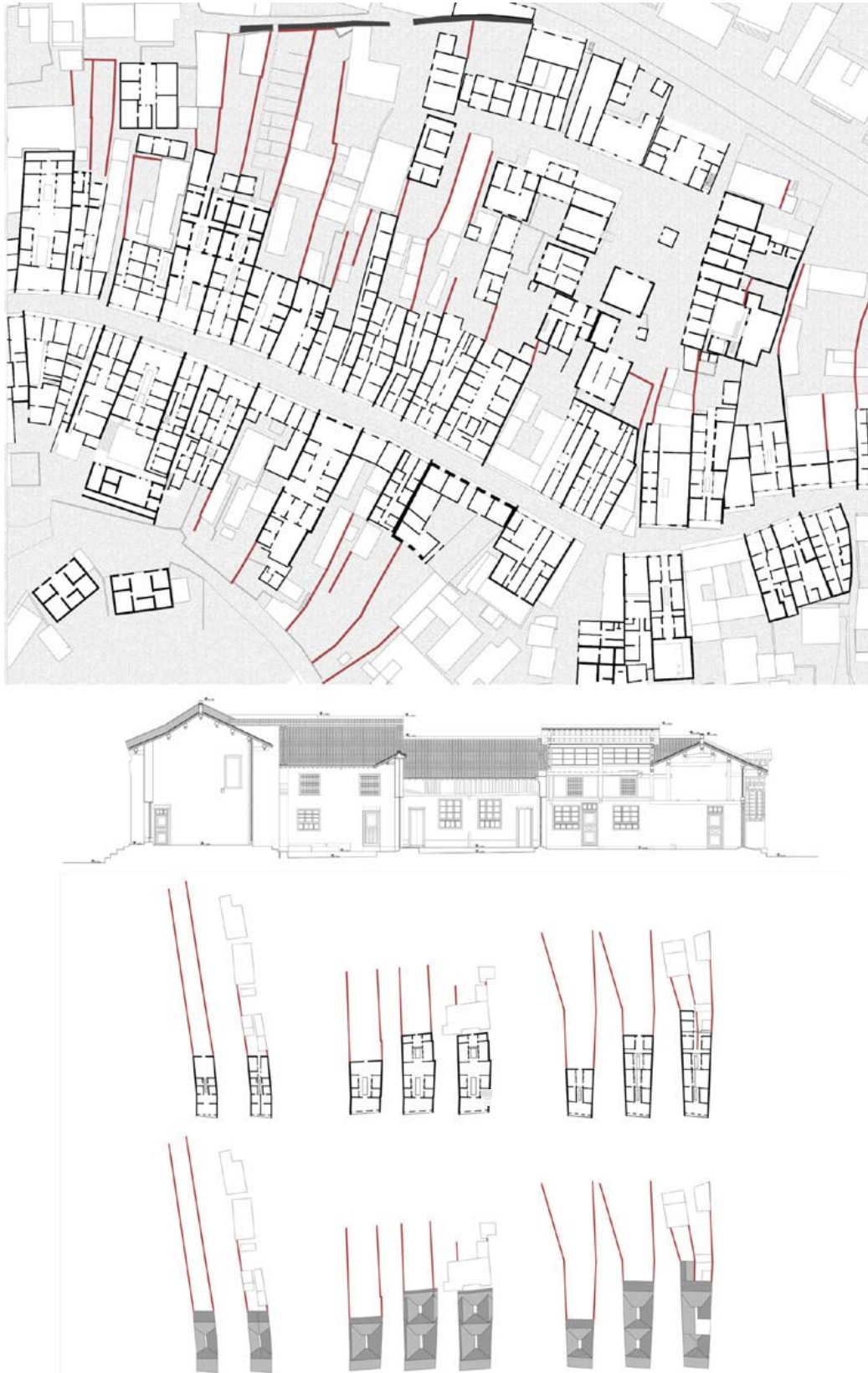
Figure 4. Fenghuang: 4.a. detail of the morphological survey of the ground floor of Old Street's courtyard houses (*zhai yuan*) highlighting the old partition walls that defined land property and are still traceable; 4.b. longitudinal section through the Dang Courtyard House and examples of historic permutations of the *zhai yuan* courtyard type.

Some major results can be here summarised.

Comparing the latent structure and historical accumulation, four cycles of development traceable in their different strategies have been detected (Fig.3.a). The five morphotypes that can be acknowledged based on the triple relationship between type, morphology and land, led to redefine on sound criteria the boundaries for an articulated conservation plan (Fig.3.c).

The notion of *landscape units* (Conzen, 1988; Whitehand 2007) could be introduced while contextually reformulated in terms of complex *semantic morphological units* (Pezzetti, 2019) based on ascertained morphotypes not necessarily homogeneous since they includes also subsequent accumulation (Fig.3.c).

Considered as a *substrata*, the latent structure is the underlying order that provides new meaning even to some recent parts of the settlement, since under the apparent disorder they followed the old tracks and developed on previous structures.

Following the *lines of force* of existing structuring *substrata*, the site can be read and decoded in its internal logic, re-significate, re-morphologised and finally, regenerated. By activating the existing lines of force and 'exploration paths' within the radial fabric, the courtyard houses together with the new design writing may double the active fronts in order to generate new economic activities and a mixed residential-hospitality use throughout the year (Fig.3.c).

Another achievement of the research is that the *writing of the ground* also defines a *topographical figure* endowed with an iconological quality. Such figure is no less important than that formed by the built heritage, embodied in the winding 'wings' of the Phoenix (Fenghuang). Both emerged and lived in a mutual relationship that encapsulates the meaning of Fenghuang's urban-rural form. The joint presence of a typo-morphological solidarity among courtyard houses and a clear topographic structure allows us to read this entire settlement's form as a superior-grade *organism-figure* (Fig.5.c).

This figure is real, readable and rewritable, i.e. is available for future appropriate writings and coevolve over time together with society.

It is therefore a matter of interpreting the principles of continuing to write over a layered text that is already written and that even in China can be read as a *tabula plena* rather than an upcoming blank slate.

To continue to write, the text must be also rewritable in the essence of its formal and syntactic structure.

Understanding of the *figurativety* (*figuralità*)[8] of a latent structure is the necessary quality for reading architecture, city or landscape as a '*mise en forme*' and thus, to continue to write and compose meaningful worlds bridging the past, the present, and the future through interpretative design.

Footnotes

[1] The expression force-idea is used by Aldo Rossi (Rossi, 1974).

[2] The research has been conducted by the author at Politecnico di Milano under the framework of the 'Heritage-Led Design Workshops', 2015-18, directed by Proff. L.A. Pezzetti and K. Liu, and Double Master Degree with Xi'an University of Architecture and Technology. Analysis and drawings were executed in team with master degree students (M. Cappellani, W. Longfei, G. Mazucchelli, C. Mondani, M. Pozzoli), supervisor L.A. Pezzetti.

[3] The research has been conducted by the author on the case study of the 'Heritage-Led Design Workshop' in 2018, and has been discussed extensively in the book L.A. Pezzetti (2019) and in the paper 'Layered Morphologies and Topographical Structures in Historic Rurban Landscape. Integrating Typo-Morphological, Topographical and Landscape tools with Feng Shui' presented at the ISUF Conference 2019, *Cities as Assemblages*, forthcoming.

[3] Sui Tang Chang'an hierarchical grid was organised in Li fang block which were like a 'city in city' from the point view of its pattern structure. Li fang were surrounded by high walls, were divided in 2 (Ri) or 4 regions (Tian) with respectively only two or four gates corresponding to inner streets. The gate were guarded by people appointed by the government, opening and closing at regular time. Only regular residents could access.

[4] The existing blocks are slightly shifted from their real position unveiled by the ruins discovered in the north-western corner of An Ren Fang, at those time still buried.

[5] Many cultural and educational infrastracures are today placed along this axis.

[6] The fragments of the Lu Dafang's stele map in the Song Dinasty feature the most ancient known representation of the capital Chang'an (now Xi'an) during the Sui-Tang Dinasties.

[7] The term defines the rural land division in ancient Roman *centuriation*.

[8] Starting from the '90s the 'figure' (*figura*) of composition became a crucial issue for the study of both city and territory within the tradition that Manfredo Tafuri defined as the 'axis Milan-Venice'.

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Place Royale: An heritage to rediscover

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Abstract

For more than 60 years, the balance between the commemorative vocation for tourism and the development of an inhabited and lively neighbourhood has remained unresolved in this historic urban environment. Some buildings have literally been rebuilt; others demolished. The original plans of some buildings show that the restoration begun in the 1970s did not respect what seems to be the essential characteristics of the buildings nor the traditional construction techniques, completely eradicating certain historical periods in the built forms. Today, 40 years after this restoration, this urban ensemble, managed by SODEC, an agency of the Government of Quebec, is facing major maintenance work. This paper allows us to question the nature of the restorations 50 years ago.

The research project is therefore interested in taking a new look at the implementation of these decisions from an architectural and morphological standpoint, with a view to understanding the constructive culture of the site. The primary aim of the research project is to draw on the historical, archaeological and architectural documentation listed, with a view to understanding the buildings and urban space at the spatial level, with the transformation of space as its focus. More specifically, the research attempts to answer the following question: what are the essential characteristics of the buildings and the urban ensemble of Place Royale that make it possible to establish its rules of composition?

This approach proposes a method that makes it possible to review of heritage practices, using Place Royale, an emblematic and determining place, to grasp the way in which the built environment is viewed and acted upon in Quebec. While the intentions have been widely commented on, the actions have remained without evaluation in their logic and impact.

Place Royale: a political and ideological restoration in the 1970s
Highlighting a founding site
Place Royale is Quebec City's founding site, which was restored between 1955 and 1999. Today, 26 buildings are managed by the Société de développement des entreprises culturelles (SODEC) on an area of 1.67 hectares. Located in the historic district of Old Quebec, Place Royale, is facing the St. Lawrence River, and bounded by Saint-Pierre Street, Côte de la Montagne and Petit-Champlain Street.

This is the first establishment of a new European proto urban core in Canada (Vallières, 1999), thus recognized as a fundamental heritage site for Quebec City. This is largely due to its development, commonly established by the scientific community as the birthplace of French America (Côté, 2001). However, it is only by the mid-1950s, that this site was awarded an historical and symbolic function. It indeed became a vast restoration project, largely carried out between 1970 and 1985 (Léonidoff, Côté & Huard, 1996). More specifically, the restoration began with the Maison Chevalier in 1957 and was extended into an urban project between 1967 and 2008 (Dufaux, 2018).

The current interpretation is that such a project was the last manifesto by a State driven analysis of a desire for a national representation (Noppen & Morisset, 2003). The outcome is an intervention on the built environment and the urban fabric restoring the French stamp to the area, and capitalizing on its tourism potential (Ouellet, 2015). These choices raised several debates among both the scientific community and the larger public (Faure, 1996; Morisset, 1998). Nevertheless, Quebec City historical center is registered by the World Heritage List of UNESCO, a recognition largely driven by Place Royale as the first permanent settlement of New France (Côté, 2001).

After 40 years, most of the buildings are currently undergoing maintenance works, affecting the masonry, doors, windows and roofs. These works raise questions about the site's use and the decisions carried previously during the earlier restoration. Some of the demolitions appear today unjustified and the reconstructions turned a working-class and lively neighbourhood (Cimon, 1991) in a museum setting. Since 2016, theses architectural choices are reviewed as part of a research project initiated at Laval University in collaboration with SODEC, the City of Quebec and the Ministry of Culture (Dufaux, 2018).

Restoration: assessing the outcome of the 70s restoration project
Many parts of Quebec City historical center and its surroundings have been the topic of several studies looking at the history, the spatial development, the architecture and the archaeological remains preserved on site (Côté, 2016). The restoration of Place Royale is documented by numerous reports drafted by historians, archaeologists and architects, sometimes seeking to provide an overall vision, more often describing the results of sites' specific researches. However, the design choices on the buildings, the overall planning and the development perspective remain unexplained. At the same time, the balance between the commemorative vocation for tourism and the development of a lively, inhabited neighbourhood remained unresolved for the past 60 years (Faure, 1996).

The buildings' restoration works intended to recreate the urban environment of the first half of the eighteenth century (Deanovic, 1964). As a result, Place Royale has seen many later buildings completely demolished and rebuilt. Furthermore, the properties' lines erased their historical traces. In this regard, the Place Royale project presents a paradox (Faure, 1996). How could we justify the destruction of what was claimed to be preserved (Faure, 1996)? In addition to the revised properties' lines, the dwellings' layouts were replaced by "modern" interiors. The Archival sources – notably leasing contracts signed at notaries – indicate that most houses sheltered two to four dwellings since the 18th century (Desloges, 1984). During the restoration, exterior doors were changed to windows in order to pretend that the large houses were single-family residence of wealthy families (Dufaux, 2018).

In many cases, the reconstruction plans show that the transformations of the built environment did not respect to the essential buildings' characteristics, nor the traditional building techniques in favour of modern ones. The evolution of space has been confined to archaeological excavations (Picard, 1979). The old masonry structures, the levels of

the cellars and the dating of the foundations were all recorded data, but they are not included of the restoration project. Instead, Place Royale restoration favoured a symbolic representation or a figurative "French" identity (Larochelle, 1998).

The research, its objectives, its conceptual framework

Today, Place Royale reflects a paradoxical balance between the representation of an historical French colonial identity and the restless modernity of the 1970s (Deanovic, 1964). My research project targets a renewed reading of the design decisions from an architectural and morphological point of view. The goal is to provide methods and criteria to review and complete a restoration process, one that is more faithful to the forms, the constructive tradition and the lifestyle it supported. Thus, the research question: what are the essential characteristics of the buildings and the urban scales of Place Royale? And how they should guide the restoration process while confronting a new maintenance season?

The first objective intends to sort the information gathered through various studies, to provide a synthesis and to document the built and urban architectural scales of Place Royale in order to carry out a morphological analysis. The second goal expects to establish the architectural recurrences and specificities of design components and solutions as to outline the rules for the composition of the built parts of Place Royale. Finally, this process should identify the design principles, interline the essential elements and their relationships, and understand the relative commonalities and specific architectural and urban features.

The targeted theoretical framework is research based focusing on the processes of transformation of ancient built environments (Caniggia & Maffei, 1979), i.e., morphogenesis. This discipline includes several key concepts, including morphology (urban and architectural) and typo-morphology, all to be applied in the research project. The research will focus on the architectural type, a collective creation and a product of the local material culture (Muratori, 1946). Through research, the study will explore of the relationships between physical norms (material domain) and the cultural patterns (habitus), as part of immaterial realm. This should enable an understanding of the transformational dynamic rules characterizing the built environment.

The cultural model, according to the sociologist Henri Raymond, is made by the way of doing or thinking things. They condition certain behaviours or predispositions leading to determined actions (Raymond, 1974). Cultural models influence behaviour's related to housing (constructive practices, uses, individual meanings or social representations) and are materialized by the architectural types. Thus, the study of the urban form and the buildings' architectural types of Place Royale will be combined with the study of cultural models and habitus specific to this historic district. It should enable us to draw a portrait of Place Royale's constructive culture of, considering the evolution of its operational history, read in the buildings' traces and marks.

A First case study: the Vaults
A typical building feature of the French regime

A first case study explored the vaults found across Place Royale's building, as part of the studio's exercise during 2019 winter term. Underground vaults are fairly common in Place-Royale, but exceptional in Old Quebec, especially among residential construction (Figure 1). These basement spaces were used mainly for commercial purposes, but sometimes as kitchens (Lapointe, 1991).

This architectural component, made of massive stone arches tells the stories of the commercial life of the French colonial city, the residential architecture and also the site's evolution. For the merchants, the vaulted cellars were essential. They were introduced following the great fire of 1682, as they provided protected space against fire hazard. In addition, by maintaining a constant temperature throughout the year, they made possible to preservation of goods and foodstuffs. In most cases, they were located directly under the houses. However, some were extending under the streets and there is one that was built under the Place Royale itself. One finds private wells, fireplaces, bread

ovens, and sometimes also dairies and cellars.

The common layout is made of a single vault under the house' span, but it is possible to find two vaults divided by a wall supporting the upper floors. The cellars were commonly disconnected from the ground floor, thus isolating the activities.

Their construction

The building of vaults was never described within the specifications or the construction contracts. The vaults are complex masonry structure. Whether they span over one or two arches, they support both static and dynamic loads. Given the high loads, it is possible to believe that the space between the masonry and the floor, starting from the pedestals and the cradle, must also be filled with stones. Among the cases observed at Place Royale, three types of vaults were found, namely those with a low arch, the semi-circular arch, the basket-handle arch and, exceptionally, one edged arch (figure 3). It would seem that in order to reduce the calculation of thrust loads and the angle of the stones, the masons built the pedestals closer together and made the vaults thicker (Lapointe, 1991).

Léonidoff offers one construction hypothesis. He suggests that the vaults were been built with sandbags, placed on the pedestals, to support the wooden hanger. The stones would have been laid from the wind chests to the keystone. Once the vault was erected, the masons lowered the wooden hanger so as not to interfere with the settling of the vault. Once the mortar between the stones is set, the masons proceed to loosen the mortar, opening the sandbags, in order to lower the wooden hanger. Depending on the mortar's traces, it is possible to deduct which technique was used. When one finds wood traces on the mortar, and the mortar covers the base of the wedges, the sandbag technique was not used. When sandbags were used as a construction technique, while removing the mould, the stones of the pedestals remained visible, since the sandbags prevented the mortar from flowing over the vault, thus avoiding the complete drowning of stones (Léonidoff, 1989).

Today, vaults confront several issues related to water infiltration, natural ventilation and maintenance, while their function is mostly storage (SODEC, 2019). The current analysis performed focused on each case study individually without comparing them in terms of their materialization and location in the urban.

The vault as a key to the development of the architecture and site of Place Royale

Buildings' construction and the French colonial urban environment will be transformed by the framework set of numerous urban regulations, addressing sanitary conditions and the aesthetic concerns. Furthermore, these transformations were responding to the rigorous climate and the frequent fires that affected Quebec City during the 17th century. Following the 1685 fire of the Quebec City settlement, Intendant De Meules issued an ordinance regulating the houses' footprints, since many had appendages on their facades, which encumbered the already narrow streets (Castelli, 1975). While increasing space between houses, thus reducing the fire hazard, such regulation intended to set order and embellishment in the urban form, prohibiting balconies, canopies, drums, steps, gutters, shutters and other similar elements that hung over public right of way of the streets.

Around 1727, a more general regulation was enacted, moving exterior staircases to the interior; limiting the stoop to three steps encroaching the streets' space (Castelli, 1975). Place Royale became a dense urban nucleus, the commercial center of the colony, where by the end of the 18th century two to three storeys large stone houses sheltered a large number of dwellings (Castelli, 1975).

The previous analyses focused on each house as a particular case. Collecting this information at the urban scale reveals that the construction of the vaults, which started following the 1685 fire, met three objectives. First, the vault provided a fire-resistant space to secure the merchants' goods, a key concern in colonial trade. The construction of vaults supported the masonry construction of the houses' upper floors. It favoured the densification process with taller buildings and met the construction regulation aimed at

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& | and
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protecting and embellishing the town. Finally, the building of vaulted basement occurred on slopes, at a middle point between two levels, in order to simplify the excavation. This location made possible the levelling of the square and streets connecting Place Royale.

The urban mapping of the vaults of Place Royale, based on of 18 archaeological reports and historical plans, reveals the extent of the ground levelling. Indeed, the provision of Place Royale square itself in front of Notre-Dame des Victoires church, was made possible by two underground vaults. Notre-Dame Street, from Place Royale to Côte de la Montagne, was raised and flattened thanks to the vaults of the neighbouring houses. Even St-Pierre street, on floor below Place Royale was actually raised above the original ground. The site of Champlain's Habitation, the early trading post established in 1608, offered undoubtedly much steeper slopes than what we perceive today. This further underline the location's defensive position. (figure 4). The morphological findings of the architecture materialised a hypothesis often stated by scholars.

The vaults location, between two ground levels, mean that they were generally served on one side by a ground level access, and light by cellar windows that provide natural ventilation and the necessary aeration for an underground space. A staircase was located in an independent exterior addition (Lapointe, 1991).

Today, most of these cellar window wells are either walled or below street level. By redesigning the street profile to clear the basement window wells, we understand that the current roadway level is about 1 meter higher than the original level one (figure 2). The phenomenon of sedimentation that raises the street level is a historical reality throughout the world and is confirmed in Quebec City.

Considering the original street level, it becomes clear that the ground floors of the houses in Place Royale were intended for habitation, since the doors were 3 to 4 steps above street level. Drawings by the military in the early 19th century include these stoops in front of the entrances. The position of the vaults, their uses and their impact on the level of the residential ground floors until the end of the 18th century, shed a new light about the incomplete restoration of Place Royale. The understanding of the urban and the architectural morphology provide clues about the intended experience for residents and visitors.

Results and findings
Place Royale: a physically segregated location

Place Royale was originally the hearth of the urban development of Old Quebec/ Lower Town during the 17th and 18th centuries and thus the original proto-urban core of the city. However, this area gradually lost this primary vocation as the city enlarged (Larochelle, 2002). Because of the geomorphology of the site, Place Royale can be defined as an "inner periphery", where the neighbourhood is forever enclosed between two natural urban barriers, the cliff and the rivershore:

«Ainsi, la Place Royale et le site des Palais, qui comptaient parmi les pôles structurants de l'espace public collectif sous le Régime français, en sont venus à occuper une position très marginale, dépourvue de toute polarité, dans l'organisation spatiale de la ville actuelle.» — (Larochelle, 2002)

For instance, over time, the merchants moved their residential premises to Quebec City upper-town, leaving the houses for less-affluent dwellers of shops- and innkeepers and low skilled labour working for the harbour. The gradual shift increased in the 20th century, reaching a state of relative abandonment, especially after 1945. Many buildings were poorly maintained, and after 1948, some burnt down stressing the economic decline of decreasing market value. A first set of three houses were restored between 1955-59, another two in 1960-63, By 1967, the celebration of the Canadian federation led to a common federal provincial historical urban renewal project (Berthold): Place Royale became a priority (Faure, 1992).

Vaulting: the key leading to a new reading

Vault basements are a typical built form and construction technique associated with the French colonial city. The gathering of the archaeological reports describing the vaults of the various houses in Place Royale made possible the drafting of an urban map: their location, date their construction, their current state and use by visiting them. The vaults location at the urban scale revealed unsuspected facts about the site original topography and the "production" of Place Royale's square (figure 2). The vaults reveal the former street levels, and thus, the height of the ground floors' around Place Royale, (figure 4). The research integrated the reports of various researchers - historians, archaeologists, architects - at the scale of the buildings and the urban ensemble, opened a new perspective on the restoration decisions, largely forgotten since the management of the buildings by the SODEC since 1982.

Future studies

The master project will extend a similar research procedure to other components of the Place Royale built environment. This analysis will deal with functional logic, the composition and the organization of the built and urban space of Place Royale.

For the time being, two observations emerge from the first enquiry. First, the contribution of transversal comparison of the different elements identified and documented in the various fields of knowledge - history, archaeology, architecture - in order to avoid addressing each building as a particular case study. Second, following the same logic, to look for recurrent solutions in order to better assess each building's specificities. Such an framework attempts to go beyond the premises of art history in favour of an operational history of the built environment.

Thus, it will be necessary during the analysis to cross-reference all the information with historical documentation and testimonies, iconographies, the history of land division and property transfers, current testimonies, articles, books and theses. This integration of these various sources will then make it possible to sketch an overall portrait of the building culture of Place Royale; to develop typological hypotheses and lead to relevant intervention in these buildings.

The research project intends to favour a more coherent restoration at the time when most properties are facing major maintenance works. It claims that it is possible to review of heritage practices, where Place Royale plays an emblematic role and a determining experience in the preservation of the built environment in Quebec.

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Figure 1. Overall plan of Old Quebec. Pink: vaults present in Place Royale in the houses (basic fabric, lower town). Yellow: vaults present in specialized buildings in Old Quebec, Upper Town.
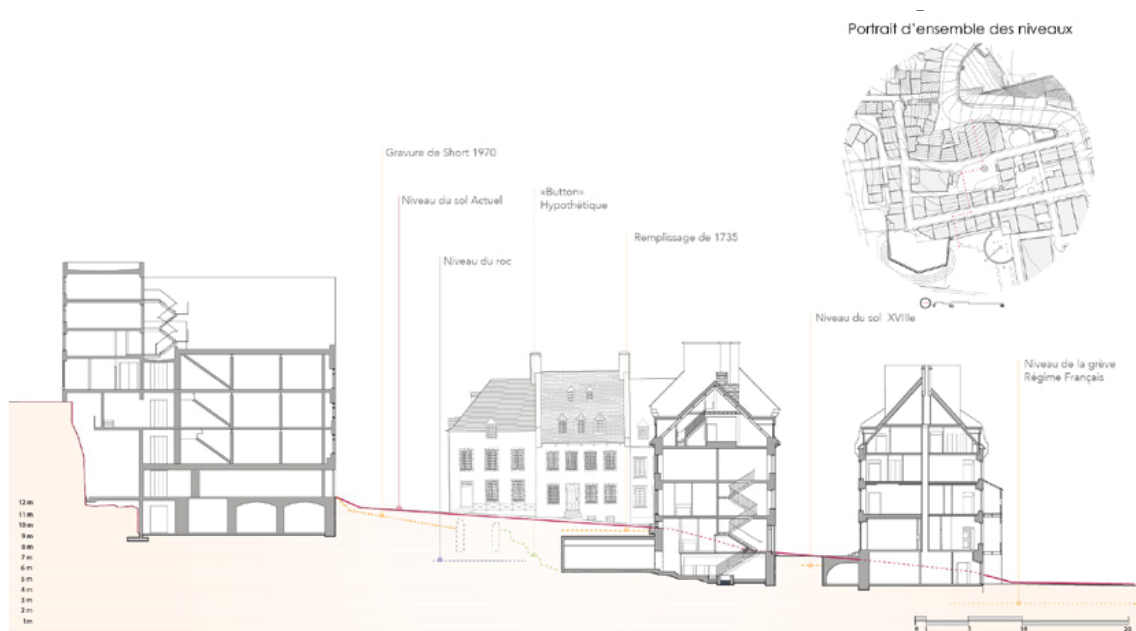
Figure 2. Cross-section representing the historical ground levels present at Place Royale. The different layers of history reveal an actual ground level 1 meter lower.
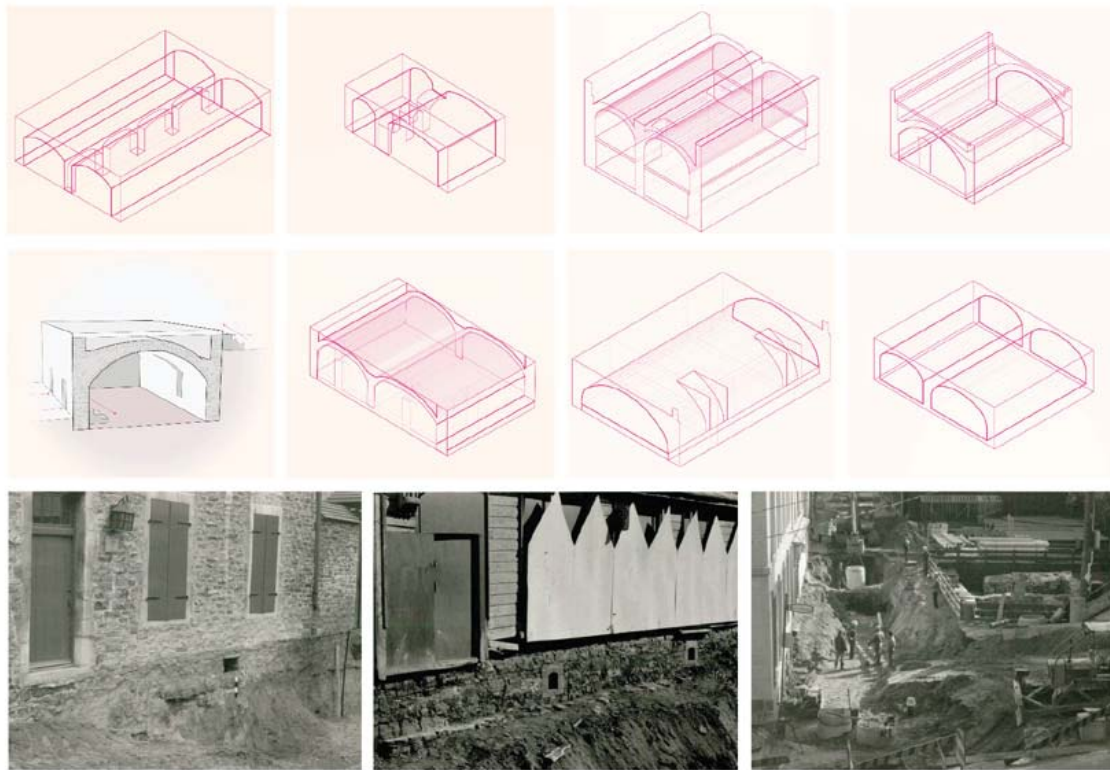
Figure 3. Models of the different types of vaults present at Place Royale, at the same scale. Bottom left: Principles of spatial organization of the vaults (theoretical). Bottom images: Historical photos of the basement window wells discovered during the excavations of Rue Notre-Dame, taken from the 1987 report (Photo S. Rouleau, A86-30 #11)

Figure 4. Cartography of the vaults of Place Royale.in pink: vaults still existing in Piazza Royale. Yellow: demolished or disappeared vaults. Pink dotted line: theoretical topography line of the period of Samuel de Champlain's Habitation.

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Public space in São Paulo: The fair as a form of urban land occupation

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Abstract

In the contemporary scenario, by recognizing the city as a result of a historical process, it is possible to understand how public spaces are essential to the development of this territory, as spaces of plurality that enable appropriations and several human manifestations. Therefore, public spaces can potentially ground public and social urban life. The objective is to comprehend the usage of urban public spaces in a consolidated urban territory, and to investigate how ephemeral appropriations may redefine the public space's meanings, uses, and perceptions. For this, it was defined as a research object the Bexiga neighborhood, at a macro scale, and the Dom Orione Square and its fairs, as a local approach. Bexiga, located near the downtown, is part of a process linked to the Brazilian coffee economy of the 19th century, receiving Italian immigrants and freed slaves. In spite of the urban modifications experienced throughout the 20th century, Bexiga maintains the peculiarities of tracing and parceling land, as well as the buildings. The recognition of its importance as a historical and cultural heritage occurred in 2002. The study analyses the territory, the Antiques Fair, the Jardim Secreto Fair and the transformation of the square's environment through those. In summary, the temporary appropriation of a public space alters the place and stimulates the use of this area and the surroundings, influencing the urban dynamics. Also, the process enhances this site as a place of social coexistence and stimulates new experiences and perceptions of space.

Introduction

'Every urban space was, is, and will be concentrated and poly(multi)centric. The shape of the urban space evokes and provokes this process of concentration and dispersion: crowds, colossal accumulation, evacuation, sudden ejection. The urban is defined as the place where people walk around, find themselves   standing before and inside piles of objects, experience the intertwining of the threads of their activities until they become unrecognizable, entangle situations in such a way that they engender unexpected situations' (Lefebvre, 2002, p. 46).

Therefore, it is in the public space that exists the contact with each other and with the city, it is the exchange's place, sheltering plurality and otherness. As Calliari (2017, our emphasis) states '[...] the physical experience of being in the street, of seeing other people, walking and going to places is *irreplaceable*'. This is how the vitality of public spaces appears as a fundamental issue in this debate.

The urban public space's appropriations are present in the daily life of the city, squares, parks and streets are occupied by the most diverse activities, both in daily situations and events. Currently, in São Paulo, there are examples as Paulista Avenue on Sundays, the Minhocão (Elevated João Goulart) every night and on Sundays, the street carnival, which has gained great proportions in recent years and occupying several streets in the city and claiming manifestations. These uses transform the public space, even that for a certain period, and make explicit the importance of public space's appropriations to activate the urban dynamics and the public and social life.

Thus, it is through the temporary appropriation of public space, which carries the intention of using it in different ways than conventional, that it can be resignified. It is observed the composition of an ephemeral environment in the public space that while establishes relations with the existing space enables new experiences.

This study search to understand the appropriation of public spaces as the influence of this on the consolidated territory's urban dynamics. So it was defined as a research object the Bexiga neighborhood in São Paulo, at a macro scale, and the Dom Orione Square, as a local approach, in order to understand the use of the square especially when hosting fairs, given that it is one of the only public spaces in this historic neighborhood. And then to understand the changes in the territory through the fairs that generate new possibilities for perception and experience in space.

Thus, understanding the transformation of public space through its appropriation is to recognize the performance of an urban territory within its context and the power of public spaces as support for the activities of urban public and social life.

The production of urban public space

In the contemporary scenario, by recognizing the city as a result of a historical process, it is possible to understand how the city's identity is connected to its past and its transformation process as how public spaces are an essential part to the development of the occidental city's identity and the public life. Therefore, briefly resume a historical panorama that contextualizes the urban public space.

In the classical period, agora was the most vital element of the city, it was as an open space that exert social role, it is the place of meeting and exchange (Mumford, 1961). But '[...] above all, a place for the word; and probably there isn't even an urban market where the exchange of news and opinions, at least in the past, hasn't played nearly a role as important as the exchange of goods' (Mumford, 1961, p. 167).

By replacing the agora by the market square, in the medieval city, public space becomes the place of encounter and exchange, then '[...] commercial exchange became an urban function, which was embodied in a form (or forms, both architectural and urban). This in turn gave urban space a new structure [...]' (Lefebvre, 2002, p. 22). Thus, Lefebvre (2002, p. 22, author's emphasis) also states that '[...] those places given over to exchange and trade are initially strongly marked by the signs of *heterotopy*'.

In order to comprehend the public spaces' dimension in São Paulo, especially downtown, briefly approaches the circumstances of the production and occupation of public spaces during the city's development.

Frúgoli Jr (1995, p. 18) approaches what '[...] leads public spaces to deterioration while prioritizing the creation of privatized spaces, thereby depriving the meaning of urban life in its public terms'. And as Lefebvre (2002) states, differents city production forms depends on the current production modes as on the continuous cumulative process of knowledge, people and even capital.

In the early twentieth century, note a development model characterized by the urban area expansion, the occupation of the railroad margins by the factories and the occupation of the peripheries by the lower classes. With this city's growing development, the traditional center of São Paulo, once an elite space, became '[...] a gradually deteriorated, heterogeneous and popularized space, being abandoned by the social layers of greater purchasing power' (Frúgoli Jr, 1995, p. 25). The moment is also marked by a large population increase, due to the high number of national immigrants, mainly from the Northeast.

Urban transformations became even more prevalent in the 1950s and the 1960s. In São Paulo, this time defined a new phase of the urban territory's spatial organization, even by the Basic Urban Plan of the Municipality of São Paulo (1968). However, in the authoritarian context of the time, urban planning was enforceable, prioritizing '[...] the transport and the flow, with the opening of large avenues, viaducts and later the subway' (Frúgoli Jr, 1995, p. 74). The elevated highway João Goulart's implantation, the viaduct Armando Puglisi's construction and the street Treze de Maio's enlargement were some of the major interventions downtown and at Bexiga's neighborhood.

'The increase in the metropolization of São Paulo meant for the central public spaces a visible and growing devaluation, parallel to an increasing subjection to the logic of the flow of automobiles. This situation, accentuated by the fact that a good part of the social groups with greater purchasing power are gradually abandoning these spaces to carry out their relations in places of a more privatized character [...] reinforces the representation that the streets are spaces of total degradation, crime, horror, social ills, marginal social groups (image constantly fed and magnified by the media)' (Frúgoli Jr, 1995, p. 72).

At the end of the twentieth century, there is an expansion of the debates around public spaces in São Paulo through the International Seminar on Revitalization of Central Areas (1975) and the International Seminar Centro XXI (1995). As Abrahão (2008, p. 59) states, in the period between the seminars that '[...] the term public space started to be generically used to name the set of squares, parks, streets and avenues, being linked to it a universe of meanings'.

Currently, the occupation of the central public spaces by various social groups is increasing, although a deteriorating view of this spaces persists. Therefore, there is a resumption of the perception of public space as a meeting and exchange place that awakes this reappropriation through several activities that drive the use of space by people (Calliari, 2016).

Bexiga, Bela Vista, São Paulo

Bexiga, part of the traditional Bela Vista neighborhood, was the result of a large Brazilian political process, since the mid-19th century, characterized by the coffee economy - with São Paulo as an exporter, abolition of slaves, establishment of the Republic, presence of new immigrants. The specialization of uses and functions begins in the city through new legislation and urban practices with European parameters. The neighborhood, originally a quilombo on the center historic outskirts, is characterized by a diversity of productive activities, the coexistence of different social strata and ethnic groups, implying different forms of housing (Schneck, 2016). Its growth was due to successive European and later internal migratory waves. Currently Bexiga is recognized for its importance as a historical and cultural heritage, which implied the integral listing of the area in 2002.

The center needs to expand gave rise to new real estate developments. Bexiga was was one of the first neighborhoods allotted to the center, in 1878 (Paes, 1999). The first streets appear at Barão de Limeira Farm, between Riachuelo Street and Brigadeiro Luís Antônio Avenue. Besides the oligarchy, capital-possessed immigrants worked at Bexiga Farm, becoming land developers such as the German Victor Nothmann, the English

family Clark and the Portuguese Antônio José Leite Braga.

The hydrographic network - Itororó, Saracura and Bexiga streams and the Reúno tank - as well as the rugged relief were determinant in the form of occupation of the area. Its hills were gradually allotted and occupied mainly by Italians, in general artisans who built their homes according to techniques that gave the neighborhood a particular shape, that currently concentrates one third of the buildings listed in the city. Bexiga unique morphology accommodates building types from the late 19th and early 20th centuries. Its rapid densification implied the implantation of a short-distance tram line in 1889.

The topographic levels difference in the neighborhood were large due to the valleys defined by the streams that had the most influence on the structure of the Bexiga, as they ran open. Due to this also the Bexiga's staircase construction in 1929 that connects Ingleses Street to Treze de Maio Street, one of the neighborhood heritages.

Orthogonal allotment with extensive blocks and long and narrow lots had predominantly two-story houses. Due to the shape of lots and the topographic levels difference, the elongated houses had elevated basement. Thus, the entrance was from the side and the facade was aligned with the sidewalk and ornate and with large windows. In 1930, the neighborhood already had considerable land occupation and most buildings had little or no space between them (Paes, 1999).

The implantation of Avenida Nove de Julho in the 1940s redefines part of the neighborhood. In the 1950s, the urban network of Bexiga was already consolidated. Part of the northeastern migrants of the city went to live in the neighborhood due to its good location and the offer of housing with more affordable rents, as in the tenements. Therefore, the neighborhood became denser while maintaining the general characteristics of occupation, except for the uses that began to diversify.

In the 60s, 70s and 80s, the valorization of individual transport and the projects for new roads affected the neighborhood in a negative way. The city center and Paulista Avenue, expanding centers in the late 1960s, made Bexiga a passage region, which led to some of its roads being widened to accommodate traffic, such as Rui Barbosa Street.

In the early 70s, the construction of the East-West viaduct divided the urban plan of the neighborhood into two parts and thus changed the historical design of blocks and demolished important buildings, in addition to leaving inhospitable spaces in its shallows. The intersection of Rui Barbosa and Treze de Maio streets changed to receive the Armando Puglisi viaduct. Part of the block formed by the Fortaleza, Treze de Maio, Rui Barbosa Streets and Brigadeiro Luís Antônio Avenue was demolished, giving way to Dom Orione square.

Finally, the configuration and occupation of the neighborhood are the result of this whole process. The current urban network reveals the permanence of the design of the blocks, lots and buildings.

'Thus, it is clear that the urban form translates the record of the history of civil and public actions and that it is possible to apprehend which ideology guided the land occupation over time. In this sense, the urban form is consolidated through overlapping historical layers' (Costa; Netto, 2015, p. 32).

When looking at the public spaces of the neighborhood, Dom Orione Square stands out as one of the only public spaces. So, through the data obtained in the Digital City Map of São Paulo (MDC), it is identified that in the Bela Vista neighborhood, an area of 2.84km², 1.31km² (46,09%) corresponds to the built area and 1.53km² (53,91%) to the not built area. Besides it notices that 2.01km² (70,75%) corresponds to the private area and 0.83km² (29,25%) to the public area oh this territory. Beyond that it is noticed that most of the public area is car traffic area (67,73%) while the sidewalks and squares correspond to the minor percentage (32,27%). This urban conformation is a legacy of road interventions that occurred in the 1960s and 1970s. As pointed out by Frúgoli Jr (1995), the metropolization of the city of São Paulo implied an increase in road logic and the devaluation of public spaces.

According Lefebvre (2002, p. 111), the urban situation is generated by the city when centralizes everything and highlights social relations, between them '[...] the reciprocal existence and manifestation of differences [...]'. The author also states that 'the signs of

the urban are the signs of assembly: the things that promote assembly (the street and its surface, stone, asphalt, sidewalks) and the requirements for assembly (seats, lights)' (ibidem). Therefore, the region urban form allows recognition of the possibilities of occupation and meeting. In this scenario, it wonders how the configuration of urban territory implies for public life in the city or how these spaces allow people to use and occupy them.

Then it becomes evident the importance of Dom Orione Square as one of the only public spaces with nearly 5264,60m² that was created from road intervention, with no intention of enhancing public and collective space. So, the use of Dom Orione Square resignifies the territory and urban dynamics and transforms it into a collective space that today is part of the neighborhood and the cultural heritage of this urban territory.

Overlapping activities that take place there daily: antiques fair, place of events for neighborhood organizations, playground for children, meeting place and game for the elderly, that is, due to its character as the only public space that makes these events possible in the whole nucleus of the neighborhood (Paes, 1999).

Currently, the Square is configured through areas of vegetation, bounded by low walls and railings, and paths, with a more central open area, facing Fortaleza Street, where the bandstand, playground, tables and chairs fixed concrete and physical exercise equipment are located. There is also a small building, the former base of the Metropolitan Civil Guard. In a revitalization in 2017, the bandstand was rebuilt, a new playground was installed and there were improvements in public lighting (Special Department of Communication, 2017).

Occupation and resignification of public space through the fair

According to Lefebvre (2002, p. 121, our emphasis),

'[...] something is always happening in urban space. [...] The void (a place) attracts; it has this sense and this end. Virtually, anything can happen anywhere. A crowd can gather, objects can pile up, a festival unfold, an event— terrifying or pleasant— can occur. This is why urban space is so fascinating: *centrality is always possible*'.

It is assumed that the use of the place defines it, so people recognize the place by the meaning and use attributed to it. It is understood that '[...] the establishment of a meaning, therefore, transforms space' (Calliari, 2016, p. 58).

So if it is the use of the place that defines it, an appropriation of space that is not its daily and known use, transforms it. According to Fontes (2012), temporary interventions can generate lasting effects in places and those can be material or immaterial effects, as collective memory, cultural heritage and the connection between people and the place.

'A feeling of "belonging" between that public space and the citizen is encouraged, as it creates a favorable environment for the inhabitant to feel part of a group symbolically linked to a space that is part of their identity; although this space is not permanently revitalized as a result, this is already an important step' (Costa, 2015, p. 29).

Among several events in Praça Dom Orione, the focus of the study is the appropriation of the space of the square by the fairs. According to Franco et al. (2019), the fair is an '[...] example of a type of trade that is as old as the idea of the city - it is understood as a place of encounter and exchange" and "its permanence in the contemporary metropolis may be due, precisely, to this fluid character, of great capacity for adaptation [...]'. That way, fairs are ephemeral occupations of public space, as a 'kind of "urban event" whose presence in the city is a time variable' (Franco et al., 2019). So the research investigates two fairs that occur at Dom Orione Square: the Antiques Fair and the Jardim Secreto Fair.

The Antiques Fair occurs every Sunday since 1984 with the installation of stands for around 200 exhibitors of antiques pieces (Portal do Bixiga, 2019). This fair is a tradition of the neighborhood, a cultural and historical heritage of the occupation of this urban land. The Jardim Secreto Fair has been organized since 2013 in different areas of the city, but since 2016 the fair occupies the Dom Orione Square. Also, with about 200 exhibitors, this fair promotes small producers and conscious consumption that explores the diversity of

manual labor. Until 2019 the fair did not have a defined frequency and took place on Saturdays or holidays. Currently, with the growth of the fair and the public, it takes place once a month, on Saturdays (Feira Jardim Secreto, 2018).

The installation of stands is a fair characteristic that allows relations establishment with the space in order to give it other aspects, as the trade space configuration (Costa, 2015). XX those installed structures operate '[...] as an instrument to give the urban space new nuances intentionally: together with its context it proposes a new urban meaning' (Costa, 2015, p. 54).

Whereas Dom Orione Square is the physical support for appropriation and the space itself provides the data for its occupation, it is observed that the fairs occupy the sidewalks and square paths, in other words, those established by the space as possible for this. Thus, it is essential to understand that temporary structures and pre-existing space are inseparable in the structuring of an ephemeral environment. As indicated by Schramm and Lima (2005), 'the "permanent" city interacts constantly with a "floating" city, made of unstable spaces and architectures'.

The experience at the square is different with the fairs since the space perception is modified with the paths occupied by stands. The space public appropriation, as an event or a temporary intervention, implies the space transformation that through physical and perceptive changes establish an ephemeral environment within the public area and modify the urban public space atmosphere (Costa, 2015).

'[...] Even if they are not intentional, these sensations are direct consequences of the implantation of this ephemeral environment. The user most likely does not ponder what he is feeling, but it is evident that the sensations in this labyrinthine environment are diametrically opposed to the sensations experienced in the square' (Costa, 2015, p. 144).

The space transformation is physical by the stands and the presence of people and sensory due to the sounds, smells and sensations that the transformed place makes possible. It is '[...] a micro-region amalgamated by all that is inherent to its activity [...]' (Costa, 2015, p. 142). The physical support, the temporary structures, the use, the people, all these factors are essential for transforming the atmosphere of urban public space and for the establishment of an ephemeral environment that, consequently, alter the perception of space.

According to Costa (2015, p. 142), '[...] the buying and selling activity of the Fair is not a simple consequence of the space, since it can overflow the physical barriers that delimit the space'. The public space appropriation sometimes goes beyond the physical limits of the square. The streets, sidewalks and even Bexiga's staircase are occupied too. During the Antiques Fair is common to see traders occupying the sidewalks surrounding the square with products displayed on fabrics on the floor and the Bexiga's staircase often have their steps used as a space to rest. Even if it is not directly an occupation of the fairs, people begin to appropriate more public spaces in the surroundings. So the appropriation of an urban public space encourages the use of this space and the adjacent ones and, with this, influences the urban dynamics of the territory.

The use of space by the fair transforms the square into a place for exchange and meeting while the fair itself acts as a stimulus for staying in the Dom Orione Square and for establishing a relationship with the public space. In this way, the fairs as a form of urban land occupation transform and resignify this territory, encouraging other ways of using space and generating possibilities for new urban experiences and human relationships. Besides that, this public space occupation activates the urban space and impacts the region's urban dynamics since they are public events that attract people from outside the neighborhood. So all the neighborhood is influenced in the days that the fairs happen. As states Lefebvre (2002, p. 46),

'the urban is defined as the place where people walk around, find themselves standing before and inside piles of objects, experience the intertwining of the threads of their activities until they become unrecognizable, entangle situations in such a way that they engender unexpected situations'.

From the heterotopies concept by Lefebvre (2002) the creation of another environment within the public space can be seen as the other place, the one where '[...] a

difference that marks it by situating it (situating itself) with respect to the initial place' (Lefebvre, 2002, p. 45). Therefore, it is understood that the space is resignified when a new environment is created within the urban space through the amalgamation of actions and supports. That provides other experiences and stimulates public and social life and the relationship with the city.

Final considerations

In order to reflect about the public spaces in the contemporary city, the research sought to understand the dynamics of appropriation of public space. From the town plan and production public space analysis, it is comprehended how these factors reveal the territory history, culture and uses and directly influence the uses and appropriations of public spaces. In this research, the occupation of Dom Orione Square for two fairs, that are temporary events.

Although the two fairs have different intentions and audiences, since the first one is already a tradition of the neighborhood while the other one is a recent activity, they occupy the same urban territory and the two activate it with their proposals. Thereat it becomes evident the urban public spaces potential - multiple possibilities spaces.

Therefore, the temporary appropriation of public space transforms the space by stimulating the use of space and adjacent areas, by activating public and collective life and by influencing the surrounding urban dynamics. The public space is potentialized as a place of exchange and social coexistence. The process of resignify public space proposes other ways of occupying it and generates other possibilities for experiences and perceptions of that place.

Figure 1. Maps of Bela Vista: Sara Brasil 1930, VASP 1954, City Digital Map 2016.
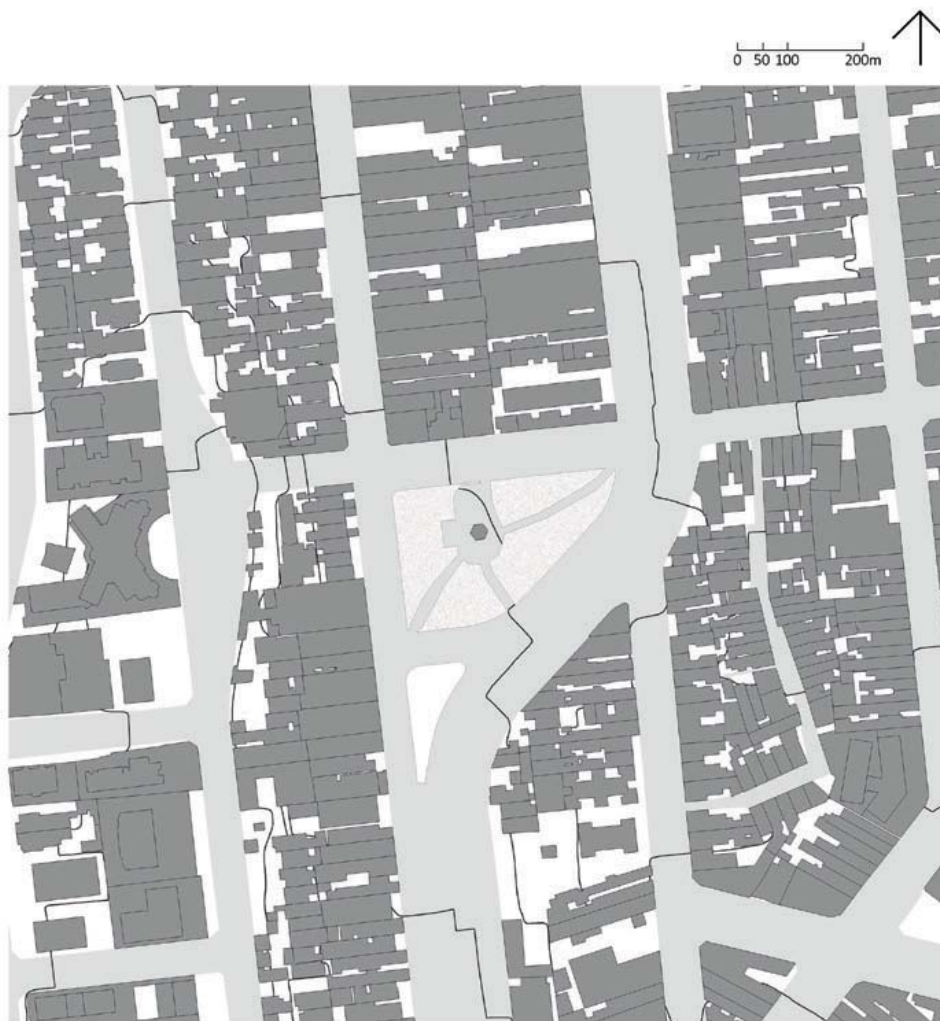
Figure 2. Dom Orione Square.

Figure 3. Antiques Fair. .

Figure 4. Jardim Secreto Fair.

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Regeneration of Sanctuaries in Ancient Cities: Pergamon Example

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Abstract

The generation of sanctuaries in ancient cities in archaic era was generally based on an origin of a specific cult. There were numerous sanctuaries devoted to the Mother Goddess cult which is common in Anatolia in the relevant era. Those sanctuaries were extended and regenerated when they became more important. Pergamon is an important example in this term. Mamurt Kale Kybele Sanctuary locates in a place close to Pergamon. In this sanctuary which is thought to have a ritual path connection with the city people started to worship the Mother Goddess from 5th century B.C. The sanctuary was extended and regenerated after it gained importance. At the first stage, there were an altar and a pedestal where the sculpture of God was placed in this sanctuary. In 3rd century B.C., a monumental temple containing the pedestal from earlier dates and a new altar surrounding the older one were built. New buildings related to the relevant cult and the needs of the people visiting the sanctuary were continued to be built along with the temple. A sanctuary devoted to the Mother Goddess not only created an important focal point which have strong natural relationships, but also turned into a built-architecture in time. Contrary to the sanctuaries in the city, an example of a rural sanctuary created an urbanization around itself. With this study, regeneration of the sanctuaries consisting of natural factors and the urban substrata constituted through its transformation to a structured architectural design were addressed and it was aimed to contribute to the relevant research field in this term.

Introduction

Ancient cities were cities that belonged to god in addition to being sacred in their own periods. Within the scope of this study, a sacred place related to the city but outside the city will be discussed and its regeneration over time will be examined. There are many natural sacred places in Pergamon dedicated to the Mother Goddess cult inside and outside the city. Two important natural sacred places within the city boundaries are Büyük Kaya Sanctuary[1] and Ilyas Tepe[2]. It is also estimated that there is a belonging cult place dedicated to Meter Basileia on the top of the acropolis in the city and to Meter Megale near the city walls (Ohlemutz 1940, p.183-185).

Natural Sanctuaries Around Pergamon

In the extra-urban area, there are three important sanctuaries; Kapıkaya Sanctuary, Molla Mustafa Tepesi and Mamurt Kale Sanctuary. The strong connection of Mother Goddess with natural rocky areas and nature makes these sacred areas special. The goddess is worshipped within or near a pure intact rock / nature piece. Kapıkaya Sanctuary is a cave located on the Pindasos Mountains (Kozak Mountains), northwest of the city, with a water supply and rock ledge in front of it. A stepped altar and various niches were carved into the rock. Cult rituals were probably performed around the cave and votives were dedicated to the goddess. There are steps and niches inside the cave that are thought to have cult statues. The finds captured in the area are dated to the 3rd century BC at the earliest (Nohlen and Radt, 1978). Kapıkaya Sanctuary is similar to the Mamurt Kale Sanctuary in terms of natural cults. The Kapıkaya Sanctuary has not undergone a reconstruction as opposed to Mamurt Kale. This comparison is important to learn about how it looked in the prehistoric period while examining the re-formation of Mamurt Kale. Another extra-urban sacred place is located on the Molla Mustafa Tepesi, an extension of the Kozak Mountains. In this sanctuary, niches carved on the rocks were identified and a votive pit with fragments was found inside. In the terracotta pieces found, the figures of the goddess sitting (sometimes in the naiskos, sometimes sitting on the throne freely) are similar in terms of both iconographic and production techniques; this shows that the sanctuary on Molla Mustafa Tepesi is a representative of Mamurt Kale in a provincial district (Ates 2014, p. 426-430). The common point of Molla Mustafa Tepesi, Büyük Kaya Sanctuary and Ilyas Tepe Sanctuary is that they are directed to Mamurt Kale and the pedestals, niches and thrones face towards Mamurt Kale. This suggests that there is a considered relationship between the natural cult areas in Pergamon and that they define a religious topography as well as defining a religious area within themselves (Ates 2014, p. 434).

The sanctuary of Mamurt Kale Kybele was founded in the 3rd century BC by the ruler Philetairos, on Mount Aspordenon (Mount Yunt), in the southern east of Pergamon. It is estimated that the Mother Goddess cult existed in this region before the temple was built. Important information about the first form of the cult is obtained through the Kapıkaya Sanctuary. Kapıkaya Sanctuary showed a modest development during the Hellenistic Period; the finds from the area indicate that a cross visit was made from the city, and people were camping around the temple and the holiday of the goddess was celebrated with feasts and light festivals at nights (Radt 1978, p. 69; Radt 2002, p. 241-242). At this point, it is possible that similar rituals for Kybele were performed in Mamurt Kale. After taking control of Pergamon, Philetairos both maintained good relations with power holders and preserved the country's integrity by endearing himself to politically weak neighboring states. He definitely expanded the city with new walls and many sacred structures were established by him. (Radt 2002, p. 27).

The Hellenes considered it as an assignment to adopt the sacred areas whose sanctities go back to the pre-Hellenic period (Wycherley 1993, p. 80). The sanctuary in Mamurt Kale also goes back to the pre-Hellenic period and it has turned into a built architecture during this period, and cult traditions have been maintained. Wycherley defines the qualities required to create the sanctuary in ancient times as the border and altar. The surroundings of the piece of land, which has a natural or artificial sign to be devoted to God, are marked by simple signs and border stones, or more impressively, the sides are

fenced or surrounded by walls for the protection of the sanctity of the place without deterioration. In addition to the original qualities, a statue of God was placed or a temple was built (Wycherley 1993, p. 81). Similarly, Cook[3] states that an altar without a temple or a statue of a deity nearby constitutes the early periods of the Greek beliefs, which is also called aniconic period. In the first phase of the cult, rituals on behalf of God are performed around this altar. With the transition to anthropomorphism, sculptures have also joined the mountain cults. In the first phase where there was nothing but an altar, there is now an altar and a god statue that has moved with it over time. In the last and third phases, the altar and sculpture are located in a defined enclosed area (Cook 1914, pp. 117-121). Smith also describes the factors which are required for the cult of a substantial god as an altar, cult sculpture and the temple containing this sculpture (Smith 2002, p. 65). In the example of the Mamurt Kale there was a peak that had been given a sacred meaning and a pedestal which is thought to house an altar and deity statues in the first phase of the cult. Over time, as the number of visitors to these sanctuaries increased, new structures for the need were added and an urban regeneration occurred in the region.

The Sanctuary of Mamurt Kale

According to Strabon; there is a temple in the name of Meter Aspordene, the mother of gods in rocky and barren mountains near Pergamon (Strabon, 13.2.6). This name comes from Mount Aspordene, on which the cult area is located. The goddess is commemorated in this sacred area with a special title which is also the name of the mountain[4]. This special area mentioned by Strabon is located on Yunt Mountain, which is approximately 1000 m high, and located about 30 km east of Pergamon.

Schuchhardt made the first visit to the region, and in 1887, plan of the building remains was outlined. He was the first to realize that the region was the sacred place that Strabon mentioned. Later, Philippson and Berlet visited the region during a business trip, and in their work published in 1910, they gave information about the geography of the region, and revealed that it was difficult to reach and idle. Herren Schazmann und Jacobsthal, who worked in Bergama excavation in 1907, was asked to arrange an excursion to clarify the situation in the region. During the excursion, a pedestal with an inscription was discovered in the courtyard of the sanctuary and a plan showing the current situation was provided. According to this plan, there is a horseshoe-shaped stoa created for people who come to worship surrounding the ruins of the temple. All the structures in the region are made of trachyte stone. In the light of the information obtained, the first detailed study was initiated by Conze and Schazmann in September 1909 with the support of the German Archeology Institute (Conze and Schazmann 1911, p.5-6; Ohlemutz 1940, p.174).

On the western slope of the sanctuary, traces of settlements were found in an area that is obviously the main entrance when coming from Pergamon, protected from the northern winds. In another settlement near the main entrance, a wall corner ruin of Greek character with good workmanship was found. When reaching the southeast end of the sanctuary from the ancient road, there is a rough foundation mass; probably the cult members stayed in the area at night (Conze and Schazmann 1911, p.12).

The most important building defining the sacred area is the temple and altar dedicated to Meter Aspordene. The construction area of the central courtyard, together with the temple and the surrounding halls, consists of a 67 x 67 m square (Fig. 1). The courtyard is not flattened; its surface is rough. The foundation of the temple lies directly on the rock ground (Conze and Schazmann 1911, p.14-15). The foundation of the temple, which extends in the northeast-southeast direction, is shaped according to the slope of the land.

The Doric style temple rises above 4 steps; it is 9,60 m wide and 12,92 m long. The dimensions of the stylobate are 7.21 x 11.35 m. Some of the flooring stones are preserved in situ, and the pronaos is 0.10 m below the cella. The pronaos is surrounded by the wall, not by the columns (Conze and Schazmann 1911, p. 18, 19). Two columns between two antes form the facade of the entrance. Although pronaos and cella are of similar depth, floor coverings are different. The floor stones in the cella are smaller in size (Fig. 2). Except for one of the architrave blocks, it was found in their original place where they fell in front of the temple facade. The inscription on the architrave seems like: (Conze and Schazmann

1911, p.20):

ΦΙΛΕΤΑΙΡΟΣ ΑΤΤΑΛΟΥ ΜΗΤΡΙ ΘΕΩΝ

Attalos' son, Philetairos, dedicated this to the Mother of the Gods.

Thanks to the stereobate and well-preserved dimensions of the architrave, the width of the front facade of the temple was reached as 6.80 m (Conze and Schazmann 1911, p.22). There is a triglyph - metope decoration on the frieze above the architrave.

The pedestal in Cella forms the basis of a cult image. The pedestal is older than the temple and dates back to the 3rd century BC. It is thought that a cult statue in naiskos was placed on this pedestal. Some of the pedestal was damaged in the construction of the new temple, however, 1.34 m long above the step and 0.55 m high riser height are visible. At the same time, this pedestal is 1 m below the floor of the cella (Fig. 3) (Conze and Schazmann 1911, p. 28-30). In the depiction of the cult statue and naiskos, the fragments of lots of terracotta in and near the temple provide important data. The restitution perspective of Conze and Schazmann is illuminating in this regard; the goddess, depicted in naiskos, is on a throne.

It is estimated that this road was covered by the distribution of large flat stones between the temple and the altar; the connection of this ceremonial road of approximately 5 m is located at the lower step of the temple stairs. Before the temple was built, the base and altar in this region belonged to the pre-Hellenistic period and was preserved after the construction of the temple. The connection between the two liturgical elements was given importance and connected by a ceremony. In the arrangement made during the Philetairos period, the construction of a new and larger altar was accomplished and old altar was also inside of it. The long side of the altar does not extend parallel to the temple facade as usual, but is placed right-angled. This settlement was built on the basis of the old altar (Fig. 2) (Conze and Schazmann 1911, p.31). In the restitution drawing of the old altar, the current state of the foundation can be seen. The natural stone under the altar was untouched and only adapted by carving (Fig. 4) (Conze and Schazmann 1911, p.32). This suggests that this rock, as an aniconic item, may have been considered sacred and therefore built on the old altar.

A square that covers the front of the temple and around the altar was formed by enclosing its three sides with salons. The doors on the front walls of salons open to the square. Hall walls are 0.80 - 1.00 m thick and the outer surface consists of roughly worked pieces. The hall in the north is intentionally made longer and stronger than in the south, stretching one set of winds (Fig. 1). Pilgrims who come to worship and seek accommodation in big spring celebrations on behalf of the goddess are likely to be exposed to cold weather / harsh mountain conditions (Conze and Schazmann 1911, p.34-36).

Many small votive objects, souvenirs for pilgrims, figurines in terracotta were found around the pedestal where the cult statue located is. The most common figures are depictions of the temple goddess. Based on these figures, information was obtained on the cult image in the temple. In these figures, the goddess is sitting on a pedestal, with long hair, usually wearing a simple form header (polos), tympanum in her left hand, carrying a presentation bowl in her right hand, depicted with one or two lions next to her or a small lion in her lap (Conze and Schazmann 1911, Taf. XI, XII). There are also figures of the goddess on the lion (Conze-Schazmann 1911, Taf. XII-3) (Conze and Schazmann 1911, p.40). Sculptures of sitting goddess, usually depicted with a lion, are available in any size up to 40 cm high (Töpperwein-Hoffmann 1978, p.79). The most commonly encountered attributes other than the lion figure are tympanum, supply bowl and various animal figures.

In an interesting relief in Mamurt Kale, the goddess was depicted sitting on the throne in an ion column naiskos; there is a tympanum[5] in her left hand and a phiale[6] in her right hand. There is a lion figure on the left side; although it is not known exactly because there is a fracture on the right side of the piece of terracotta, it is estimated that this is a similar lion figure (Töpperwein-Hoffmann 1978, p.80, Taf. 34-A, Taf. 35- MK 1-MK 2). Two small and almost fully preserved goddess figures sit on the throne and hold a tympanum in her left hand (Töpperwein-Hoffmann 1978, p.81, Taf. 35- MK 4, MK 6). In addition to these examples, from 5 BC, 3 terracotta goddess figures sitting on the throne were found (Töpperwein-Hoffmann 1978, p.82, Taf. 35-MK 14, MK 15, MK 16). Two of the examples that have

reached to the present day as a whole are the figure of 2 women standing and playing tympanum. These figures are likely to be the worshipers who played musical instruments during the rituals of the goddess (Töpperwein-Hoffmann 1978, p.83, Taf. 36-MK 19, MK 20).

At the enthusiastic night festivals that were held in the light of torch in the wilderness on behalf of the Mother Goddess, the goddess was worshiped by accompanying music and rotating dances. These ceremonies influenced not only the rural population but also large cities such as Pergamon (Ohlemutz 1940, p.179). It gives an idea about these ceremonies in the attributes seen in the goddess figures. For example, the tympanum attribute, which we often encounter, indicates that the musical instrument was played during these ceremonies, and the supply bowl which was held by the goddess also indicates that libation ceremonies were performed.

Conclusion

The cult of Mother Goddess is a very old belief and deep rooted in Anatolia. Many of the important cult areas where this belief is apparent are mountains or high peaks considered to be the house of the goddess. At this point, the 1000 m high Mamurt Kale is one of the important examples of urban regeneration as a cult area where the belief in the Mother Goddess has continued for centuries. In the first phase of an out-of-city sanctuary, this area, whose material existence, consists of only an altar and cult sculpture, is determined only by the boundaries of the land, is stratified with the architecture built in the later stages of the cult. In the time of Philetarios, the temple, built in BC 5, this region has developed with units serving the temple and various accommodation areas.

The importance of this region is that; this cult area has existed in nature, and in the purity and peace of nature, cult rituals have been performed on behalf of the Mother Goddess. For these special rituals, probably special trips were organized from cities to this region. The importance of the region continued in the continuation of the cult, and Philetarios, the ruler of the Attalos period, proved this importance by building a temple on the old cult area. The continuity of the goddess cult allowed the sustainability of the region in terms of architecture. After the temple was built, stoas were created for those who came to worship. And even residential areas were created for officials. On the hill, a stoa surrounding the temple and the remains of three residential areas are documented. Pergamon - Mamurt Kale, which is an example of urban regeneration not only in urban centers but also in an extra-urban area and even a sacred area, is an important example for the literature.
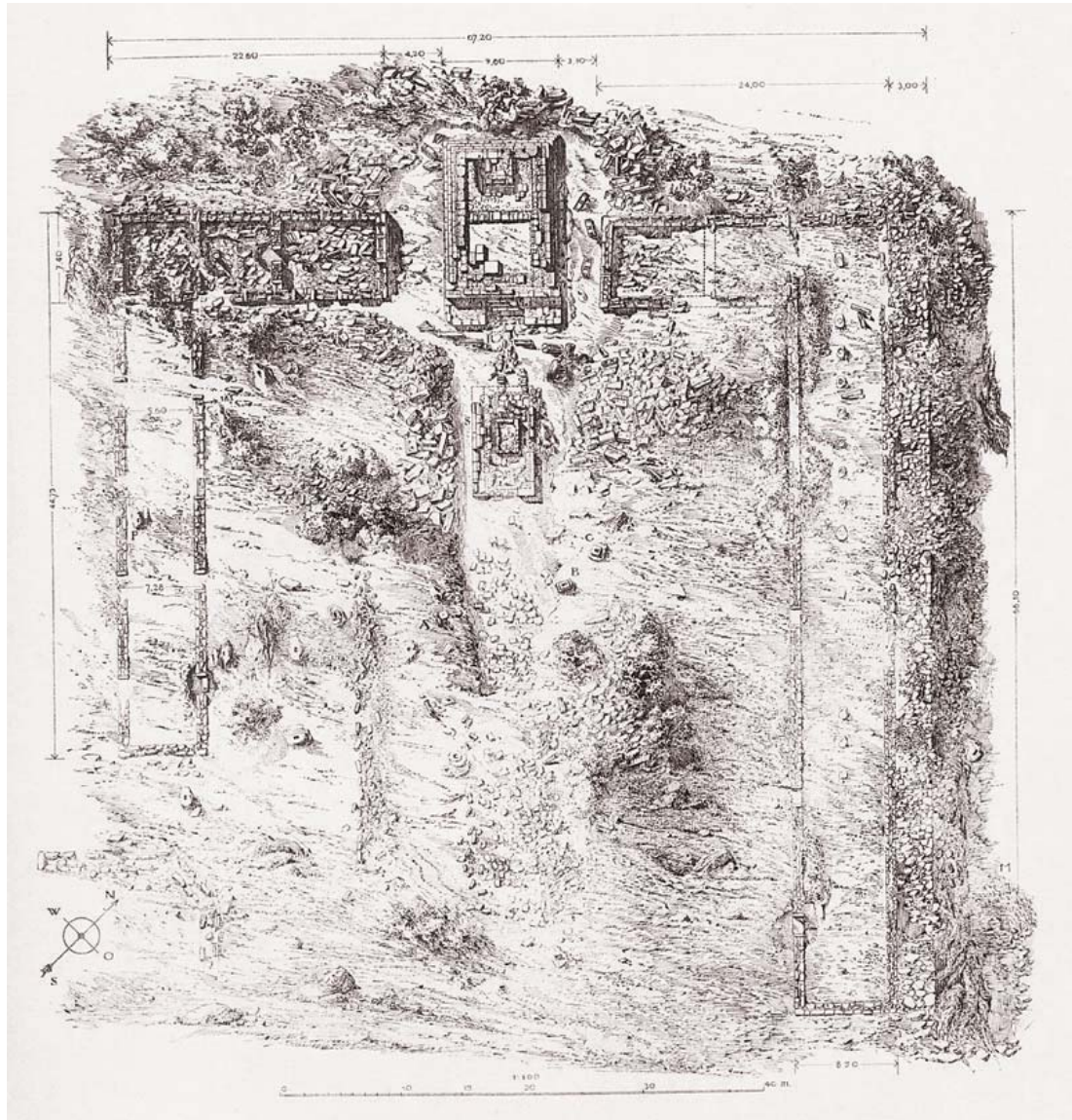
Figure 1. Sketch of Mamurt Kale Sanctuary (Conze and Schazmann 1911, Taf. 1).
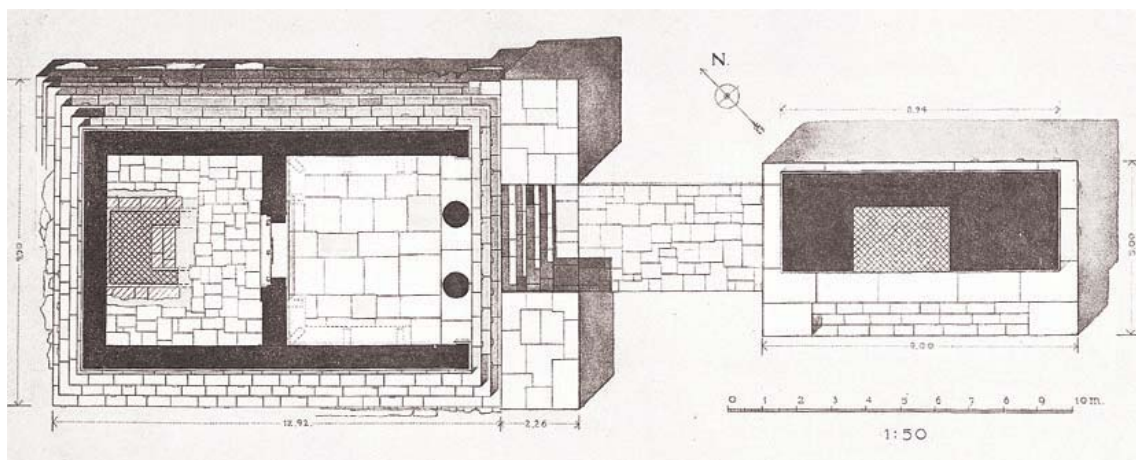
Figure 2. Ground plan of the temple and altar, reconstruction
(Conze and Schazmann 1911, Taf. 4).

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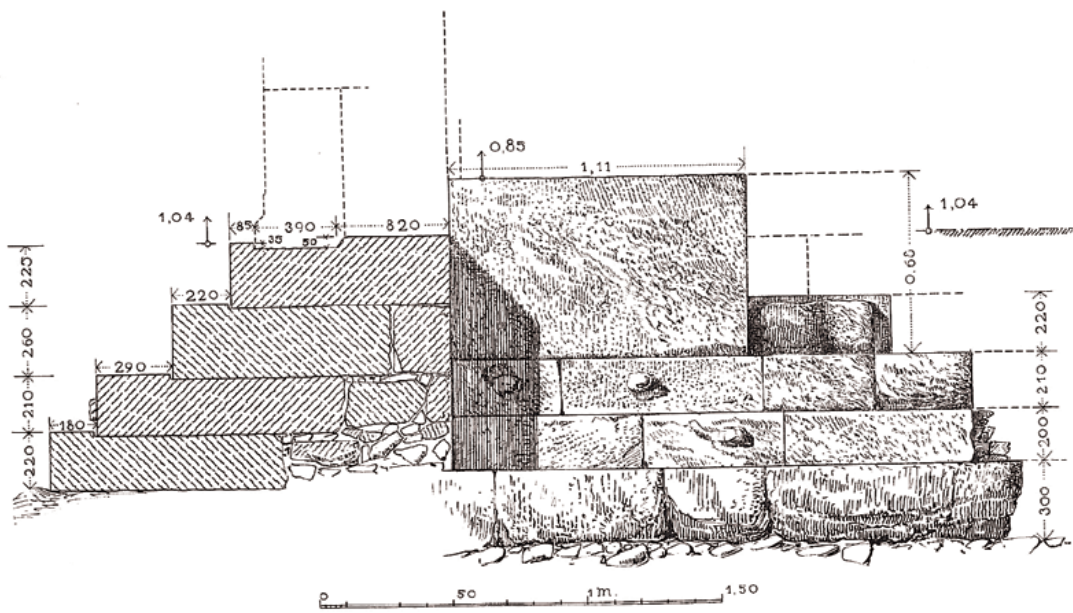
Figure 3. Section through the base of the temple andside view of the base of the image of the god (Conze and Schazmann 1911, Abb. 7).
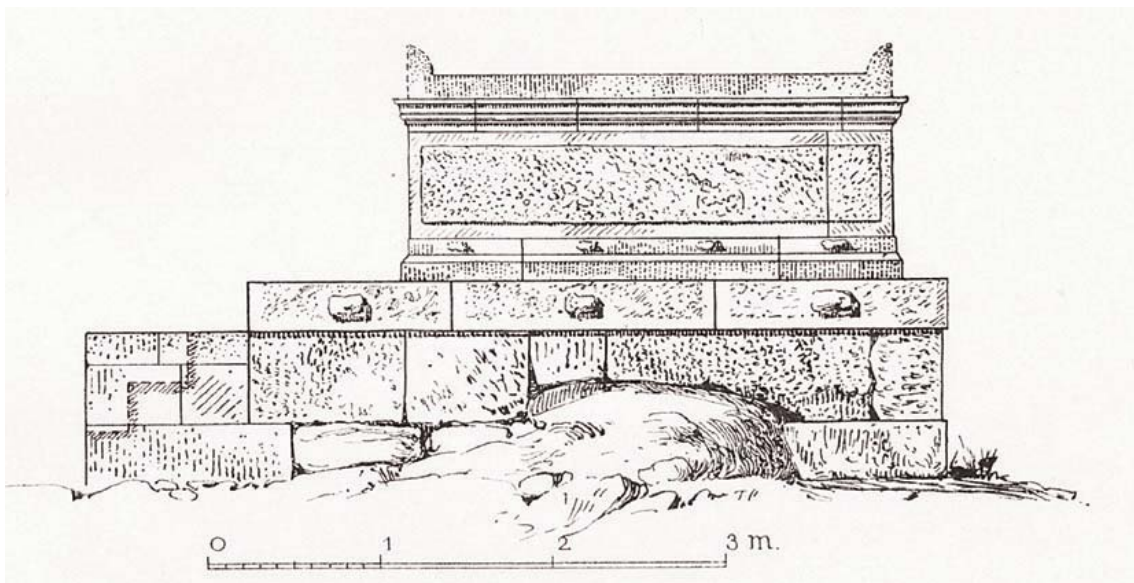
Figure 4. Altar (Conze and Schazmann 1911, Abb. 10).

Footnotes

[1]Büyük Kaya Sanctuary is located on the eastern slope of the city of Pergamon. A sculpture pedestal and pits were found carved into the rock in this area. The pedestal is thought to be a sitting god statue. For detailed information, see Pirson 2009, p. 152-154; Pirson 2010, p.145-150.

[2]A rock throne where belief rituals were performed and the terracotta depictions of Mother Goddess were found in Ilyas Tepe. For detailed information, see Pirson 2011; Ates 2014, p. 434.

[3]The context of rock monuments, which are common in the Iron Age and thought to be built for religious purposes, is primarily related to the Mother Goddess cult, later on the Zeus cult and the monarch cult. There are many cults related to Zeus known as the "God of Sky." In connection with the sky, there are cults that are called by different names regarding mountains, sun, moon, stars, earthquake, clouds, wind, rain, dew, meteorite, thunder and lightning. Within the scope of study, in order to understand the origin and evolution of the cults, Cook's related source was examined and a similar relationship was established between the cults. In the Mamurt Kale Sanctuary, the beginning of the cult is formed by a statue pedestal and an altar dedicated to God on the top of a high mountain. For more information, see. Cook, 1914.

[4]Similary, it is memorialized as Meter Sipylene in Magnesia city, located in the foothills of Mount Sipylos in Anatolia, Meter Gallesia on Mount Gallesion in Smyrna, Meter Ida on Mount Ida, Meter Dindymene on Mount Dindymos in Kyzikos, Meter Sparzene around the city of Sparza in Caria. (Roller 2013, p. 235).

[5]A musical instrument used in cult ceremonies; tambourine.

[6]A ceremonial bowl used to pour votive liquids in cult ceremonies; splayed bowl.

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The Country Magnet - Garden Cities' aesthetic background

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Abstract

Since the beginning of the Garden City Movement, the British countryside represented the opportunity to create a model society, what led to carry on the aesthetic and philanthropic tradition of building model townships in rural settlements, with the addition of some urban patterns under the practice of 'rus in urbe'. During the early eighteenth century, that practice was developed by many aristocrats and architects, who implemented rural features in the heart of cities, such as redefining the English country house and its gardens to create discrete upmarket environments. In this way, several cities like London, Bath or Edinburgh threaded this green yarn to mend the gaps between their urban fabric and their surroundings, upgrading not only their urban landscape but also triggering the re-imagining of town planning. In parallel with urban developments, significant rural landowners and industrialists rose new communities in the countryside to re-settle their employees in an idyllic environment close to their workplace. From the model village of the eighteenth century, until the industrial village of the late nineteenth century, the rural landscape was the testing ground of aesthetes and philanthropists worried about the decay of social reproduction within cities. This work is a journey through a historiographical and morphological analysis of British cities, towns and villages, which gave rise to the evolution of the first garden communities' urban form, by combining urban and rural patterns, as well as sowing the seeds of the Garden City Movement and the beginning of the town planning practice in western civilization.

Introduction

The main aim of this work is to understand the spatial structure of the garden cities through a historiographical research on their aesthetic background, which led to the inception of their existing urban grain. Just like Howard summed up his manifesto as "a unique combination of proposals" (HOWARD 1902, p. 71) according to the philanthropic tradition of reforming the society in moral townships, the garden cities' urban form comes from multiple attempts of implementing rural aspects within cities or villages, whether to frame bucolic landscapes or embody the spirit of place. In order to achieve that, the layout of buildings had a double role, on the one hand as a means to outline the landscape and on the other hand as a means to perceive it. Following these precepts, during the early eighteenth century, in Britain many aristocrats and architects upgraded urban landscapes, whilst they were creating discrete upmarket environments in the heart of metropolitan cities, taking as reference different interventions made in the countryside. The practice of this kind of intervention in the heart of urban environments began in London, redefining the English country house and its garden as echoes of rural methods of enclosure in the city. In this way, the urban palaces as well as landscape gardens were hereinafter the trigger of the re-imagining of town planning, through the practice of 'rus in urbe'[1] (ARNOLD 2005).

Rus in urbe

One of the first projects on landscape gardens fostered by speculative developers in the urban environment, which, at once, introduced the typology of urban villa, is Regent's Park (1809-1811) in London (ARNOLD 2005, p. 71). To transform the original farmland, the Surveyor General of London, John Fordyce, set up a competition in 1809 to ensure the experiment of inserting rural landscape to the metropolis' boundaries. John Nash was successful in this competition, applying the same picturesque principles as the rest of the competitors, such as tree-lined avenues, circle-shaped roads, big garden squares, decorative lakes, villas and terraces, which were laid out in different manners of distribution. Winding paths, hidden villas in the groves and water ornaments, composed the rural informality of Nash's plan and, in contrast, such imitation of the nature was faced with some iconic pieces of urban planning, such as the terrace house building with crescent-shape and circus-shape. This curious morphological combination and dialogue between natural and geometrical elements of planning, such as the crescent-shapes, the picturesque garden, the tree-lined avenues, etc., represent some of the most important and enduring aesthetic contributions to garden communities' environmental imagery. By this way, looking at the Figures 1, 2 and 3, quite similar crescent-shapes and tree-lined avenues can be identified in 1809 John Nash's first plan for Regent's Park, 1910 Ernest Prestwich's plan for Port Sunlight and 1925 Louis de Soissons' plan for Welwyn Garden City.

The inception of these circle-shapes began to take part in town planning practices after John Wood designed the Circus (1754-1768) and the Royal Crescent (1767-1774) in Bath, affecting urban developments' later in time (e.g. Edinburgh's New Town). Both curved building systems, designed by Wood as an influence of the Roman circus (MARCO 2004, p. 9), share the purpose of providing magnificent views towards the open spaces from the house rows. Just like the Roman circus was designed in a curved-shape to see the spectacle from peripheral rings of seats towards a unique central point, Wood designed these continuous terraced house buildings following the same synopticon model[2]. This way, Wood ensured wonderful and wide views from each house towards common garden landscapes, such as the enormous old plane trees within the Circus and the rural landscape close to the Royal Crescent. However, in Regent's Park, Nash included the crescent in his plan not only to provide open views from the terrace buildings, but mainly to use the crescent as a kneecap between the park and the city, through an omniopticon[3] experience from the terrace house buildings' private spaces and from the linear pedestrian ways and roadways from the public spaces like Regent Street. Along these lines, garden communities' architects used similar combinations of tree lined corridors and crescen to set out a filter between the public space, composed by playgrounds, park

ways and flower fields, and the private space, composed by groups of houses surrounded by front gardens and surrounding inner gardens or allotments. Nevertheless, such mentioned planning practices did not just belong to urban developments.

The planned village

Other examples of these public spaces can be surprisingly found in the planned villages of the eighteenth century, such as Lowther Village in Westmorland (1765-1773), which had similar elements to the previously mentioned examples, despite being one of the most incongruent urban designs in the middle of the countryside (SHARP 1946, p. 30). Contrary to the Romantic practice of 'rus in urbe' headed by John Wood and John Nash in the city, this development of houses for the landowner Sir James Lowther's labourers was a reproduction of 'urbe in rus' by the neoclassical architect Robert Adam. The influence of Classical Architecture in the original project is represented by the distribution of houses using two Greek cross squares and a Circus square in the middle of both. However, because the inhabitants of this settlement only needed around half of the plan to provide 90 houses, only a half of such geometrical squares were built, following subsequent demolitions of 30 cottages during the 19th century, which led them to build a 'U' square, a 'T' square and a Crescent (see Fig. 4). This incomplete project had the shortcoming of being too geometrical in an epoch in which the trend of the image of the homes in the countryside was composed by picturesque housing distributions rather than rational distributions. Nonetheless, this example provided a different way of planning public spaces between the houses in the future model villages, instead of simple rows of cottages as in the first model villages of the early eighteenth century.

Small settlements in a poor relation between country palaces and their attached parks were the early prototypes of model villages, such as Chippenham in Cambridgeshire (1712), New Houghton in Norfolk (1729), Well Vale in Lincolnshire (1725), Nuneham Courtenay in Oxford (1761) or Milton Abbas in Dorset (1773-1786) (DARLEY 1975). Among the common features of these model villages, are rows of cottages with ample space and enough amount of land to cultivate, churches, parks, lakes, schools and two of the main social developments, which helped to cement the community: the inn and the shop (SHARP 1946, p. 10). The row of cottages became the most compositional resource of the first model villages and this rational distribution of cottages began to evolve when landscape architects were required to design and plan small-scale rural communities and their residential typologies for the working class (DARLEY 1975, p. 10).

This way, the aesthetic effects of rebuilt villages as 'roadside villages' (SHARP 1931, p. 48) (see Fig. 5) led to the search of a new concept of villages, the 'Picturesque Village', changing the focus in landscape projects through a pseudo-haphazard distribution of vernacular style houses. As a framework to achieve that, aesthetes such as Uvedale Price set the basis of the Picturesque Village's characteristics in contrast to the city, which are "intricacy, variety and play of outline" (PRICE 1794, p. 346, my italics). In other words, the structure and order of planning as well as the design of buildings should be expressed as a simulation of a spontaneous and traditional community, establishing connections with the principles of landscape gardens and the later urban parks. These connections and inheritance over time regarding the practice of picturesque planning in urban and rural settlements, lead us to emphasize again the figure of John Nash.

Simultaneously to the Regent's Park project, John Nash took part in planning the village of Blaise Hamlet in collaboration with George Repton, both commissioned by the landowner and Quaker banker John Scandrett Harford. Since the publication in 1794 of the 'Essay on the Picturesque' by Uvedale Price, there were many individual attempts to achieve he aesthetics principles but just in isolated cottages in the countryside. In the case of Blaise Hamlet (1810), thanks to the contribution of Harford and his architects to provide a worthy retirement place for Hardford's elderly former employees, the project of a small community of nine cottages did not become just one of the first philanthropist projects of garden communities, but also, according to Nikolaus Pevsner, "this group of detached cottages is the nec plus ultra of Picturesque layout and design. English theory about 1800 had preached variety. Here is variety at its most varied" (PEVSNER 1986,

p. 176). In 1810, John Nash and George Repton designed nine picturesque cottages, evoking different vernacular styles of the regions, laid out in a square plot in a haphazard way, with a surrounding common garden, which is the key of success of this project. The inner insight from such common garden inherits the same sense of perception of landscape gardens, multiplying the effects of depth, variety, surprise and complexity of the space between the cottages, playing with the sense of public space with the implementation of a sundial within the common garden (Fig. 6). Every element, whether a chimney, a roof, a porch, a shrub, a tree, a hedge, even a climbing plant was thoroughly planned to simulate and reinforce the sense of rural community in an aesthetic way, following the precepts of Price.

After Blaise Hamlet, bigger villages and towns implemented the principles of the last model villages following the nature-worshipping tendencies of the Picturesque Movement, as in the resort for the wealthy retired people of Bournemouth (1850), "where the straight road was definitely taboo. Everything was to be natural, picturesque and romantic" (SHARP 1931, p. 137). Bournemouth, as well as the previous villages, is composed mostly by detached houses with gardens through haphazard roads, which aids to reinforce the rural environment of the town, avoiding urban physical aspects such as squares, rows of streets, circuses and crescents. In contrast, during the mid-nineteenth century, some industrialists were more focused in the opportunities of the countryside for their workers envisaging the residential area in the same way of back-to-back housing of cities, instead of encouraging the individuality of the natural microcosm for each employed.

Saltaire, located close to Bradford, was the last alternative of Sir Titus Salt to relocate his alpaca wool factory in the countryside, far away from the pollution, after his unsuccessful attempts to encourage other factory owners to implement the device of the Rodda Smoke Burner in each factory to alleviate the pollution of Bradford. He was an industrialist worried about health problems triggered by the Paleotechnic Era aftermaths, which led him to head the tradition of investing the industrial villages as new model villages to improve the living conditions of the industrial workers and set the basis of repopulating the countryside through industrial development, which was hereinafter taken as a reference in other territories of the United Kingdom and overseas. This way, Salt not only grouped his workers to carry on the production of his factory in a healthier site, but in addition established an industrial community surrounded by nature. To develop such mixed use of industrial and residential development, Salt commissioned two relevant local architects, Lockwood and Mawson, who designed 560 homes, the mill, a church, a school, a lecture hall and a park across the riverside to enhance the rural environment of the settlement. Unlike the previous model villages and picturesque villages, Saltaire does not have many private nor public garden pockets within its urban fabric of semi-detached houses, only a few restricted green areas together public buildings such as the church or the school and Robert's Park as transition between the village and the countryside. Though the urban environment at Saltaire of back-to-back housing is too contradictory for a rural settlement, the most important contribution of this industrial village was the introduction of more activities than the previous model villages to redesign the model village of the nineteenth century, which are the industrial, residential and recreational developments, sharing the same rural environment.

The suburban garden community
The green aspect on housing would not be implemented in industrial villages until the end of the nineteenth century. Nonetheless, before industrial garden villages, such a concept was experimented in suburban neighbourhoods of existing cities. After the massive ribbons of houses in close formation surrounding parks, gardens, circuses and crescents of rural urbanism at Bath or at the north-east of London (e.g. Regent's Park and Bloomsbury), during the second half of the nineteenth century, cities began to develop other concept of rural urbanism, but in a private manner for property speculation.

Bedford Park (1877) at 5 km from London, developed by Jonathan Thomas Carr, became the first garden suburb, setting the basis of low-density distribution of medium-sized detached and semi-detached houses with gardens, following the precepts of the

Aesthetic Movement and William Morris's dreams that "people lived in little communities among gardens and green fields, so that you could be in the country in five minutes walk, and had few wants; almost no furniture for instance, and no servants, and studied the arts of enjoying life, and finding out what they really wanted: then I think one might hope civilization had really begun" (MORRIS 1874). Carr and his architects reproduced the first physical example of suburban village life (see Fig. 8), creating community through nostalgic architecture, as prototypical attempts of Arts and Crafts designs.

Apart from the picturesque architecture of Bedford Park, the preservation of many mature trees and its consequent organic and radial distribution from the station are some of the physical features, which compose the 'ad hoc nature of the planning' (BUDWORTH 2012, my italics), that architects of garden communities took as reference hereinafter to lay out the planning of industrial garden villages and garden cities. Such connections are the result of the recurring picturesque trend to represent in a revival manner regional housing typologies surrounded by nature, evolving from the first model villages previously mentioned until the Aesthetic Movement and the Arts and Crafts Movement. During the last decades of the nineteenth century, London's middle classes had acquired a taste for these movements, through writers and artists, and they felt the urge to improve the industrial environment of the city to return to preindustrial modes of production and living. Because of that, Carr commissioned Edward William Godwin, who was taking part in the Aesthetic Movement, to plan and design the estate. Despite of the brief contribution of Godwin, because of several critics regarding his first house designs in Bedford Park, his successors Richard Norman Shaw, Edward John May and Maurice Bingham Adams achieved the picturesque effect that Carr had promised (GREEVES 1975, p. 7). In addition to houses, Carr built a club, a church, an inn, some stores and a School of Art, completing the ingredients of a self-sufficient community far away from the city centre. Thank to this, Bedford Park became the aesthetical prototype of the garden communities in a suburban manner and encouraged to develop a more ambitious model of garden communities across the territory, the industrial garden village.

The industrial garden village

The revival of model villages during the last nineteenth century carried on the philanthropic tradition of industrial villages as Saltaire thanks to industrialists like the Lever Brothers and the Cadbury family, who founded the industrial garden villages of Port Sunlight in Merseyside (1889) and Bournville in Birmingham (1897), respectively. However, such philanthropists were aware that they needed to strengthen the links between the people and these new settlements through new aesthetic patterns, far away from urban terraces of houses, which were "common, monotonous, repressive of individuality, symbolic of slavery and uniformity, unworthy of civilized man" (SHARP 1931, p. 150).

"Houses in which', said Lever in 1888 about his vision for Port Sunlight 'our workpeople will be able to live and be comfortable. Semi-detached houses, with gardens back and front, houses in which they will be able to know more about the science of life than they can in a back slum and in which they will learn that there is more enjoyment to life than in the mere going to and returning from work, and looking forward to Saturday night to draw their wages" (LEVER 1888, p. 2). This way, the Lever Brothers encouraged the community to cultivate their own crops, do sport, go to church, play football or bowling, go to school and reinforce the sense of community in parks and common gardens. Such a programme of activities in specific spaces were laid out by Lever's architects through the principle of open development[4] (see Fig. 9), used by Unwin and Parker fifteen years later in Letchworth: large house-gardens, low density distribution, the use of detached, semi-detached and demi-semi-detached typologies of houses and the situation of buildings well back from the street, creating informal contraction and expansion of building lines to avoid standardised ribbons of houses.

In 1910, Lever organised a contest at the Liverpool School of Architecture and Civic Design to lay out a new plan for the village, since hitherto Port Sunlight's houses were surrounding geographic features as ravines and tidal inlets, which at that time were dammed, filled in and levelled (PSCMP 2018, p. 7). Ernest Prestwich was successful in the com-

petition, proposing a radical geometrical plan composed by a cross-shaped tree-lined corridors and a crescent surrounding the church. After such contribution of beaux-arts designs, the re-imagining of Port Sunlight became a mix of picturesque vernacular architecture surrounding bucolic dells and geometrical core planning, resulting in a still perceived dual-level planning of rural and urban patterns (see Fig. 10).

In Bournville's case, as well as in Port Sunlight's, its development was the result of a previous plan to locate the factory close to the station, which was followed by a park across the Bourn stream, recreation grounds for men and women, swimming pools, gymnasium, libraries, baths, houses for workers and alms-houses for retired workers. Alfred Pickard Walker laid out the first plan of the estate in 1894, following the Cadbury family's vision. After a second sketch plan (Fig. 11) to lay out roads and houses on the former farming lands of Five Gates Farm (in the north of the factory) and Bournbrook Farm (in the south of the factory), Walker implemented a small grass triangle, which became the sketch plan's central element (HARRISON 1999, p. 37).

Unlike Port Sunlight's longitudinal expansion of the original settlement, Bournville evolved in a concentric way, surrounding the factory with more quadrangles of houses and focusing the core of the village with a church, schools and shops in the boundaries of the green village centre. Nevertheless, both cases share the same principles of 'open development', even the similar strategic position of their factories. Port Sunlight's factory was placed in the south of the settlement and Bournville's factory in the northeast, because of the prevalent southwest wind in summer, so the smoke of the chimneys would be avoided and ensure an outdoor life season for the villagers (HARVEY 1906, p. 67). On the other hand, instead of providing informality in the layout of housing, through contraction and expansion along the roads like in Port Sunlight's parkways, Bournville has beautiful examples of informality mainly in junctions to achieve not just more distance between houses, but a subtle perception of reception, thanks to the implementation of a village green in front of each group of houses.

Previously to garden cities, William Alexander Harvey set the basis to lay out large private garden-spaces or kitchen gardens on each dwelling to cultivate vegetables and fruit trees (see Figure 12), instead of developing common grounds for crops, as happened in the inside of the Port Sunlight's quadrangles. In any case, both industrial garden villages planned the core of housing quadrangles to domestic operations, hidden from the surrounding public space, following the precepts of the Arts and Crafts Movement about recovering pre-industrial customs within the community.

Just like gardens and allotments are surrounding houses and cottages as a transition between each other and the public space, the recreation grounds become transitional public spaces for adults between the factory and the houses, as well as the public parks are transitional public spaces for children between the school and the houses. The Cadbury family and their architects thoroughly planned each recreational area to be settled across the daily flows of Bournville's residents, reinforcing the synergies between work, play and life. In this way, the workers are able to do sport when they are leaving the factory, whilst children play together in the park, before both of them get home. Still work, play and life. In this way, the workers are able to do sport when they are leaving the factory, whilst children play together in the park, before both of them get home. Still today, such recreational network is working, giving life to the heart of Bournville Village throughout the day and providing picturesque landscapes of green areas flanked by community facilities, public buildings, houses and the factory, across the bucolic Bourn stream.

Conclusion

The garden cities' urban form is the result of a unique combination of urban and rural examples of British cities, towns and villages, by combining the simulation of the traditional rural community in their residential areas and the magnificence of their public space. The urban formality of their town centres comes from former urban examples under the practice of rus in urbe, for perceiving and framing the rural landscape, as well as bringing the nature to the core of the community and creating, in turn, a pleasant walk between

the residential areas and the factory. The informality of their residential areas comes from the picturesque village, by combining intricacy, variety and play of outline in the layout of houses for simulating the traditional rural community within the town. The combination of residential, recreational and industrial areas within the same settlement comes from the experience of the industrial village. The implementation of private gardens, as well as the preservation of existing mature trees comes from the suburban garden community. And the use of the quadrangle as a residential unit with inner gardens, whether allotments or recreational grounds, comes from the industrial garden village for reinforcing the sense of community throughout the residential areas of the town. In short, such mixtures of different aesthetic backgrounds were the result of several attempts of introducing traditional rural aspects within urban and rural environments, as a chain of overlapped revivals of rural imagery, which led to the inception of the garden cities' urban form, whether to frame bucolic landscapes or embody the spirit of place.
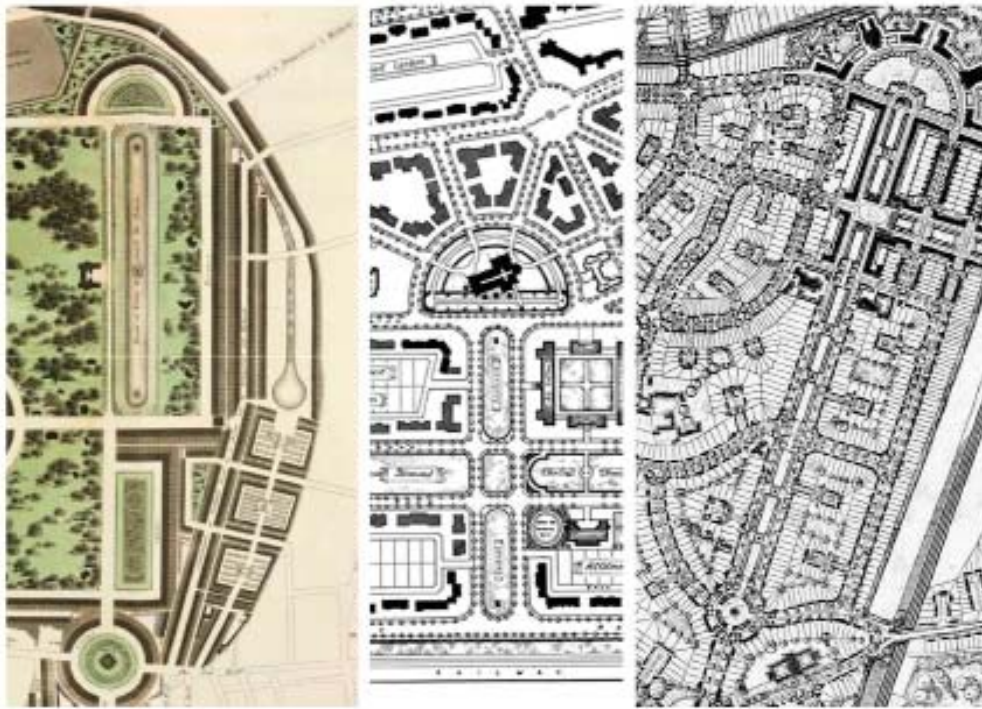
Figure 1. John Nash's first plan for Regent's Park, 1809; **2.** Erenst Prestwich's plan for Port Sunlight,1911; **3.** Louis de Soissons' plan for Welwyn Garden City, 1922.
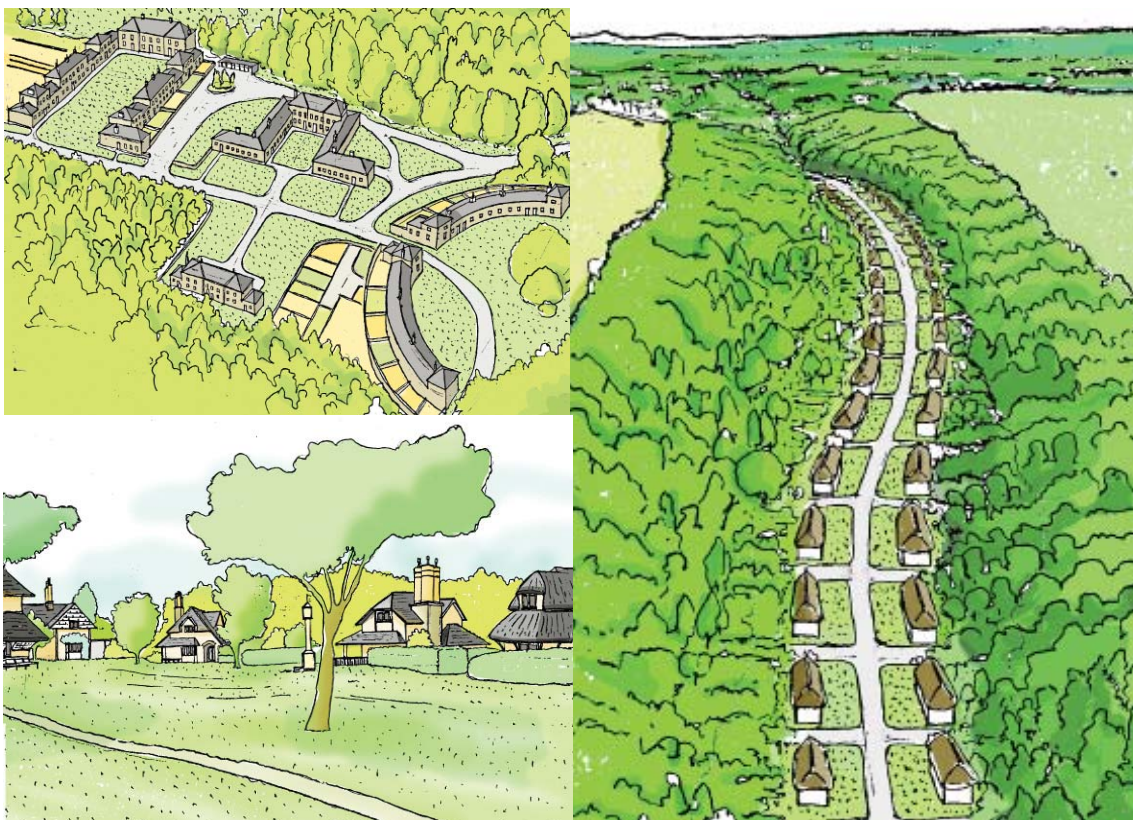
Figure 4. (from the right top to right) Lowther Village in Westmorland; **5.** Milton Abbas in Dorset; **6.** Blaise Hamelt in Bristol.
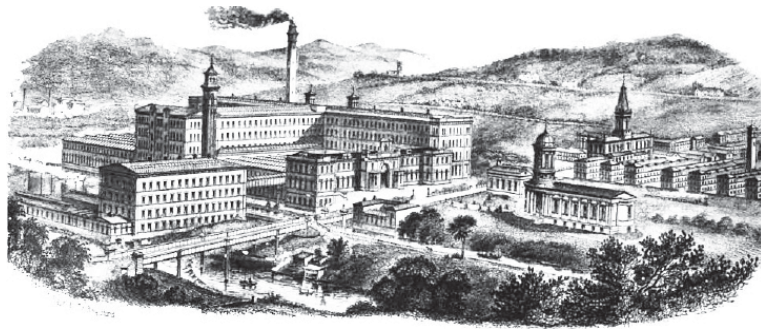
Figure 7. Saltaire in Bradford.

Figure 8. Maurice B. Adams' map of Bedford Park at Chiswick.
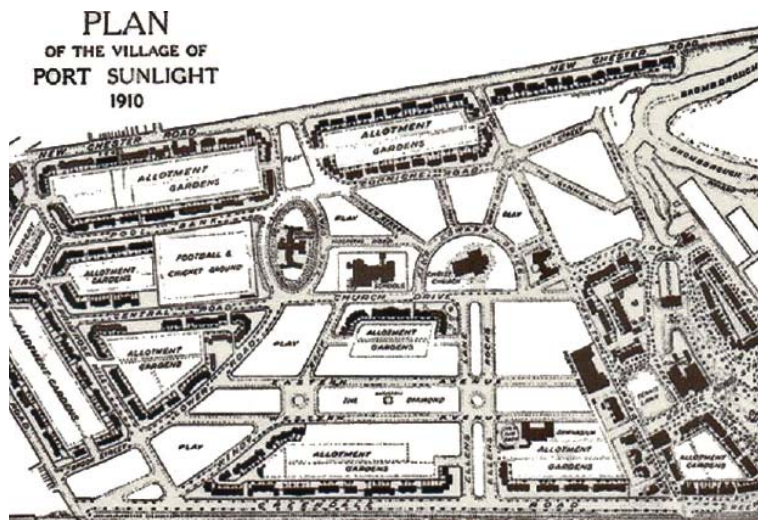
Figure 9. 1910 Erenst Prestwich's plan for Port Sunlight.
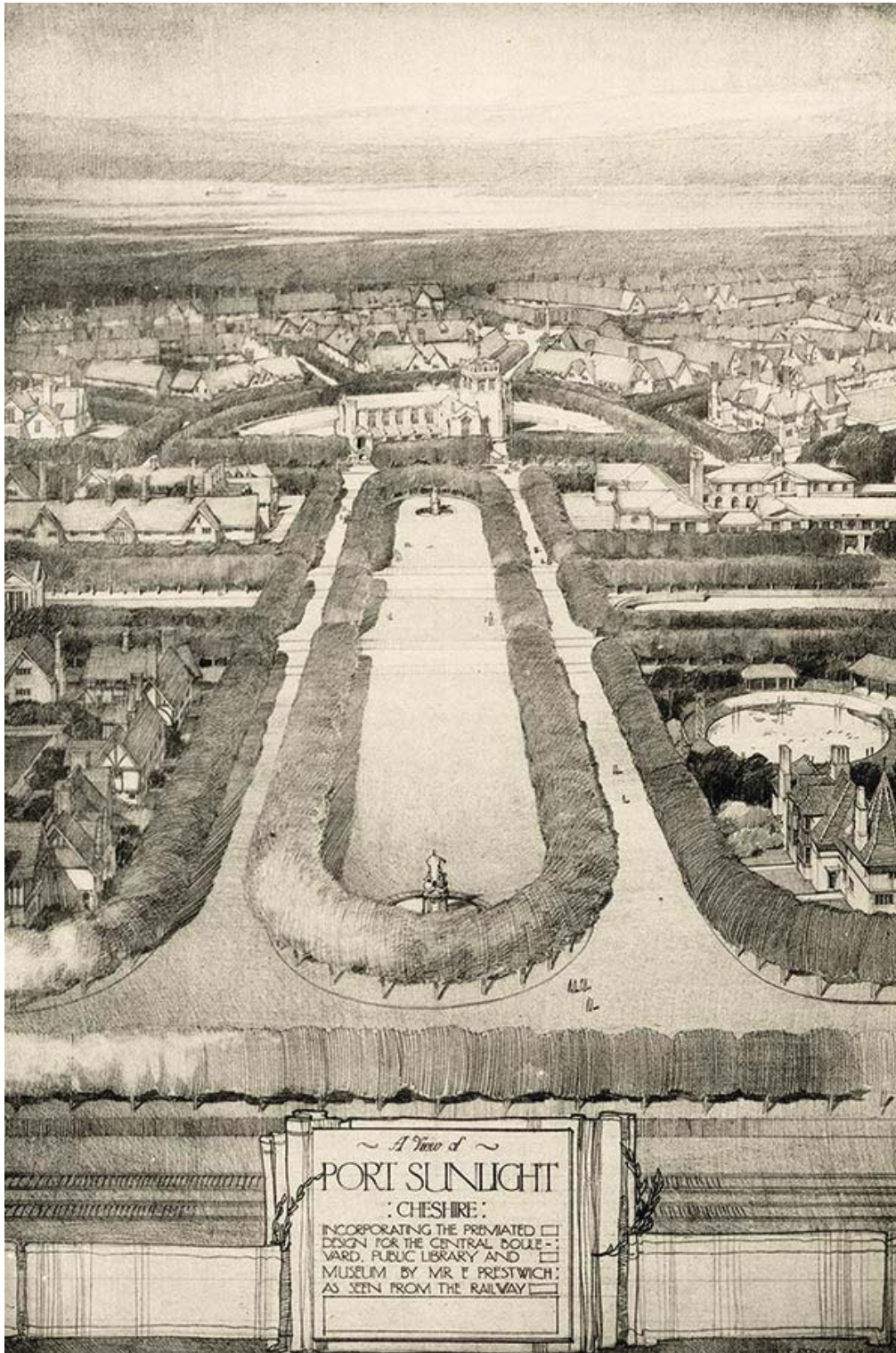
Figure 10. 1910 Ernest Prestwich's sketch about his plan for Port Sunlight.
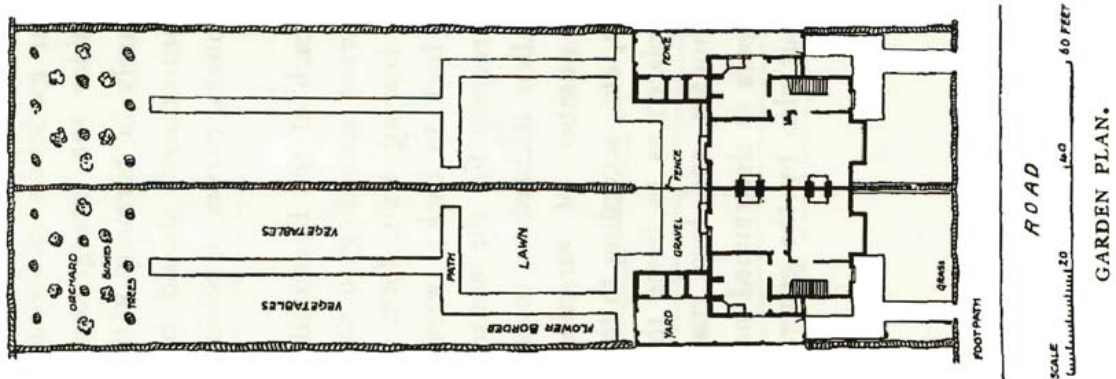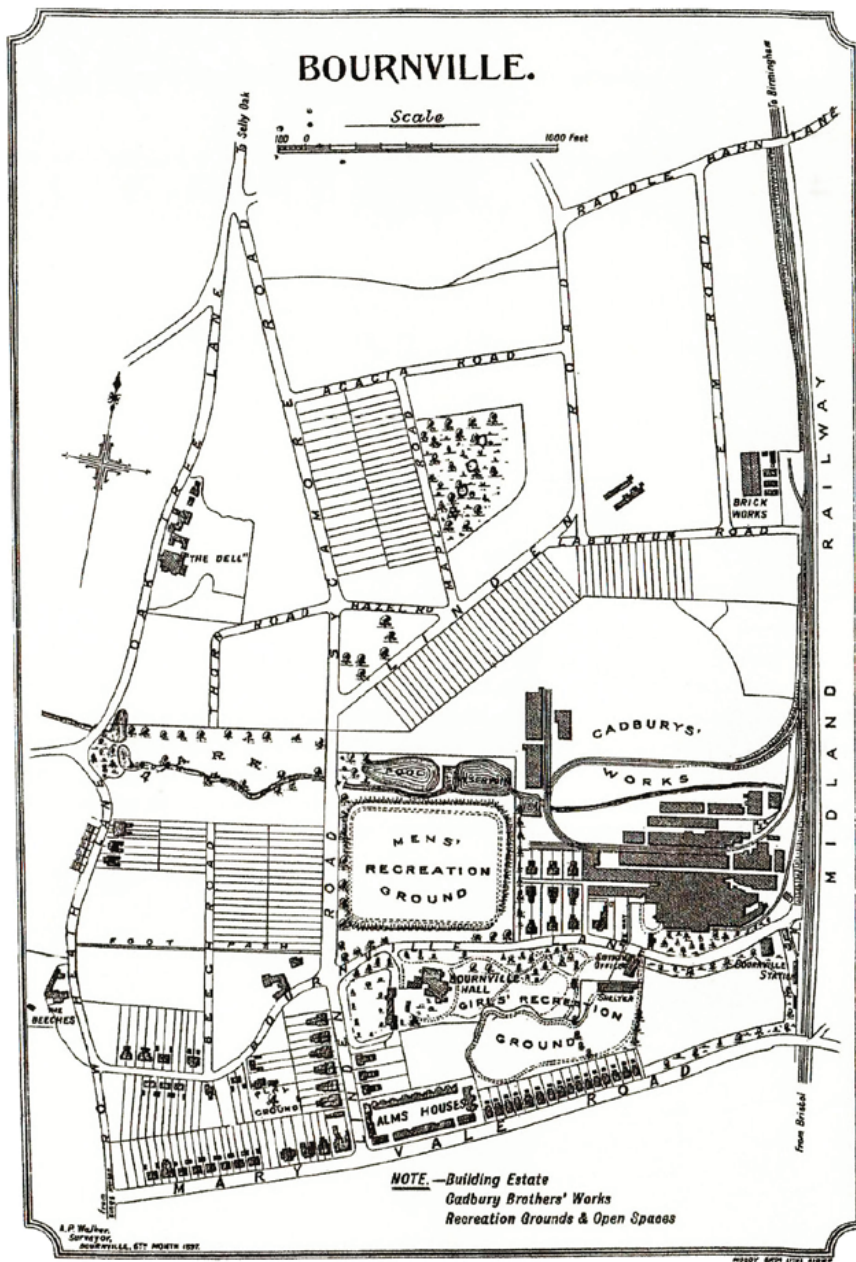
Figure 11. 1897 A. P. Walker's plan for Bournville; **Figure 12.** W. A. Harvey's garden plan.

Footnotes

[1]'Rus in urbe' is the practice of simulating the countryside within the city, through gardens or country houses.

[2]Synopticon is a concept described by Thomas Mathiesen as a surveillance phenomena where few control many.

[3]Omniopticon is the combination of Panopticon and Synopticon effects, which are experienced at the same time.

[4]'Open development' is a planning concept, which was coined by Thomas Sharp in 1932 in his book '*Town and Countryside. Some aspects os urban and rural development*'.

Caption

Fig.1 - Cadell and Davies.

Fig.2 - Port Sunlight Village Trust.

Fig.3 - Welwyn Garden City Heritage.

Fig.4 - Illustrated by the author in 2019, through an aerial photo taken in 2017 by Simon Ledingham.

Fig.5 - Illustrated by the author in 2019, through an aerial movie frame taken in 2019 by the BBC.

Fig.6 - Illustrated by the author in 2019.

Fig.7 - www.victorianweb.org

Fig.8 - www.bedfordpark.org

Fig.9 - Port Sunlight Village Trust.

Fig.10 - '*Civic Art. Studies in Town Planning, Parks, Boulevards and Open Spaces*' by Thomas Mawson.

Fig.11 - The Bournville Society.

Fig. 12 - '*The Model Village and its Cottages: Bournville*' by William A. Harvey.

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Mapping Urbanities. From morphologies to flows a new reading of Public Space.

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Keywords: *Mapping Urbanities, Morphology, Flows, Public Space*

Abstract

What is the capacity of the built space mapping to reveal the forces at play responsible for the shape and modelling of urban space? How can mapping urban phenomena extend our capacity to imagine space and therefore the possibilities of urban transformation? Starting from the ranks of theoretical thought to the study of "human/urban behavior" set by Jacobs (1961) and Gehl (1987) up to the exploration of built space at different scales of detail, the research intends to explore the power of mapping urban phenomena as a method of investigation that opens new horizons in the exploration of complex urban environments. Urban mapping is, in fact, a form of spatial knowledge production that embodies a spatial logic that cannot be reduced to words and numbers. Rather, it allows the building of interconnections between the ways in which the city is perceived, conceived and lived; and it can reveal multiple urban transformation capabilities by defining the city as a new space of possibilities. A focus will be placed on the study of urban morphologies and flows within the city by analyzing different case studies where the understanding of the city is focused on identifying the relationships between places rather than on places in themselves; on transformations rather than fixed forms; and on the multi-scale relationships of built space. The mapping of the urban structure thus becomes a research tool, a practice through which we obtain a deeper understanding of how the city works and how it could be transformed through urban planning and design.

Talking about "Mapping Urbanities" means trying to answer some questions. "What is the ability of mapping to reveal the forces involved in shaping urban shape and space? How can mapping extend urban imagination and therefore the possibilities of urban transformation? " The purpose of this research is try to demonstrate how, focusing on different urban scales, mapping can be understood as a method of spatial research that opens new horizons in the exploration of complex urban environments.

Assemblage Thinking and the City: Implications for Urban Studies

In a first focus, the research approaches the study of urban morphologies and flows through the definition of the "Assemblage Thinking"[1] through which it is possible to develop an understanding of cities that is focused on the relationships between places rather than on places in themselves, on transformations rather than on fixed forms and on multi-scale relationships. As the authors Kamalipour H. and Peimani N. affirm in the publication "Assemblage Thinking and the City: Implications for Urban Studies" : "Assembly can be effectively adopted as a way of thinking in urban studies to provide a theoretical lens for understanding complexity of the problems of the city, emphasizing the relationships between sociality and spatiality at different scales." Reading the assembly concept of Deleuze and Guattari (1987), we can say that the "Assemblage Thinking" concerns multiplicity rather than singularities, since the concept of "multiplicity and manifestations" refers to the modalities of change and the "space of possibility"[2]. In a sense, exploring the space of possibilities can become an interesting line of investigation in both theory and practice, where the designer can benefit from the "design as a research tool" process. Furthermore, the thinking of the assembly passes from the analysis of the parts to the exploration of the relationships between the parts on different scales. In this way, it can be adopted as an effective theoretical lens to understand complexity, where the results are often unpredictable within the city[3]. This is, in fact, a focus on processes rather than products. In a sense, it can stimulate the transition from a desire to focus on form to an initiative to explore the possibilities of incrementalism, adaptation and temporality in the city[4]. Starting from the relationship between sociality and spatiality at different urban scales, before talking about mapping, it is necessary to carry out a historical excursus on the research processes that led to gaining awareness on the importance of studying the "contents" and not only the "container" of the city.

Assemblage Thinking and Urban Life Studies. An historical Overview

The first studies on public life come to light, although with different forms from those of today, with the birth of industrialization in 1850 and continue with the pinnacle of economic growth and the strong expansion of construction in 1960. In figure 1 we can see a series of selected seminal works, divided by years, in which the theme of public space is directly or marginally addressed[5]. Although studies on public life began much later, in this bibliographical timeline the text of Camillo Sitte of 1889 "City Planning According to Artistic Principles" appears as the author, among the first, writes about the art of building cities and see the entire urban body as a work of art in which the building interact. In the following segment, the first public life studies, a new academic research environment for urban public life studies is established, which from 1960 to the mid-1980s. There is also a third part, which chronologically goes from the second mid-80s until the early 2000s, in which it is highlighted how studies on public life also involve environments related to urban planning and politics, demonstrating the winning interaction between studies of human behaviour and urban behaviour. Finally, there is the last period from 2000 until today, in which the study of urban public life takes an increasingly direct and necessary way to solve the problems of the city of the 21st century. All these texts define the field of urban planning in general, including the field of studies on public life. The line of inspiration, highlighted here, however, shows books that, although not directly part of the theory of urban life studies, demonstrate that they are closely connected to the theoretical foundations that defined the theme. These books have had a direct influence on the education of the sector, as a source of inspiration for the different academic approaches. Among the most important texts that mark the field of studies on public life

we must therefore highlight that of the sociologist Jane Jacobs "The death and life of the great American cities" (1961) who wrote numerous observations on urban public life in her neighborhood, Greenwich Village of New York City, "Life Between Buildings" (1971) by Jan Gehl who, as an architect, among the first directed his analysis and design studies to understand the life of public space, and finally, two famous texts "Social life of small urban spaces "(1980) by William H. White and" A Pattern Language "(1977) by Christopher Alexander which are united by the ability to explore the built space at different study scales. These texts confirm the presence of an "Assemblage Thinking" in the theoretical foundations of these authors, who, among others, experience the need to provide theoretical and methodological frameworks to explore the complexity of the problems of the city through which urbanity emerges in relation the intricate socio-spatial networks placed on the various investigation scales. The next step, in this process of identification of the meaning of "Mapping Urbanities", therefore leads us towards the definition of a true "epistemology of mapping".

"Epistemology of Mapping"

To define this "epistemology of mapping" we can start by answering a series of questions, reconnecting to those asked at the beginning of this intervention. What is the meaning of "Mapping"? Mapping can be defined as a production of spatial knowledge that embodies a schematic logic that cannot be reduced to words and numbers.[6] Specifically, mapping builds interconnections between the ways in which the city is perceived, conceived and lived and can reveal the capacity for urban transformation: the city as a space of possibilities. A map is a graphic representation of the spatial arrangement and distribution of a territory; a lens through which we see the city. Maps are therefore, at the same time, social products and tools for the social construction of cities. But how can "Mapping" be used as a search tool? Mapping can be understood as a practical tool for urban research through which researchers and professionals gain a deeper understanding of the city and how it could be transformed through urban planning and design. Spatial detection tools such as GIS, for example, in recent years have allowed a considerable proliferation of the different types of research maps used, above all, to analyse and rethink the various aspects of urban space, producing, in fact, tools for comparative morphological analyses. Here the cartographic interface is used to extract and juxtapose different layers of spatial data - for example material, social, environmental, economic and political - constructing in fact, multilayer maps that analyse the territory on multiple scales: Assemblage Thinking. Mapping therefore has a fundamental role in understanding the complex relationships between spatiality and urban sociality, in a dimension of understanding the alliances, synergies and symbiosis of the city. So, what does "Mapping Urbanities" mean? Mapping urbanities therefore means placing a "schematic and assemblage thinking" at the basis of the reasoning, which goes well with urban thinking, showing the ways in which a city works. Thanks to the work of some of the aforementioned theorists, such as Sitte (1889), Alexander (1965), and Jacobs (1961) it was possible to develop a practical method of intervention on the city, according to the forms of "schematic and assemblage thinking". The assembly of layers of data on the map therefore introduces particular ways of seeing the city. This implies making the invisible visible: data that cannot be captured by the senses become visible on the map. For this reason, researchers such as Dovey K., Pafka E., and Ristic M., have developed an urban analysis strategy called "urban DMA"[7], through which analyse the city according to parameters of: Urban density, Functional Mix (of land use), and of Accesses, intended as flows of movement within the urban space. When we talk about "urban DMA", we talk about the density of buildings in a city, the way people and activities are mixed together and the urban accesses or transport networks that we use to navigate through the built space. Like biological DNA, "urban DMA" does not determine results, but establishes what is possible, according to intrinsic characteristics[8]. Here they become a conceptual triangle of connectivity, co-operation and concentration, mapped on multiple scales from the single building to the metropolis. (Figure 2) What is important in this phase, therefore, is not only to understand the different ways in which urbanities are mapped, but

to understand the potential of each of these elements through multi-scalar investigation.

"Urban Flows of Movement"

Specifically, the theme of Access in the "Urban DMA" opens us to an important chapter in the mapping of urbanities and introduces us to the theme of the "Urban Flows of Movement", exploring the ways in which the "Assemblage Thinking" involves a shift of attention from things in itself to the flows between them; from objects and forms to processes, from synergies to interconnections; from order points to lines of movement and becoming. In fact, with the mapping of movement flows, the links between the daily and weekly rhythms of a given urban space are explored on one side, on the other, the morphological properties of density, permeability, particle size and functional mix. The maps and diagrams show that the overlapping of daily habits and routines, with the mechanical micro-rhythms of the transport systems, all mediated by the urban form and functional mix, lead to defining specific polyrhythms of a given place[9]. We can therefore say that the mapping of movement flows informs us of how a space(city, neighbourhood, public space) is used. They make known the "value" that the various citizens-users give to that area, the meaning it assumes within daily life and the role it plays within its context (urban, economic, social). Knowing how to read and combine the data deriving from the analysis of flows, it is possible to obtain a very wide range of information capable of guiding the possibilities / needs of transformation of a given space in order to better correspond to the needs of its users. Information that is very useful both in the orientation of economic and social strategies that in urban regeneration interventions.

Case Study: "Trafalgar Square" - Norman Foster And Space Syntax

The relationship between pedestrian movement and road networks has been explored, among others, through Space Syntax's research that maps topological measures of network integration. The case study that I bring to the attention is in fact, the first case of reading and Project of the public space through the Pedestrian Movement Flows and concerns the redevelopment project of the area between Trafalgar Square and Parliament Square in London, by Space Syntax and Norman Foster for the "World Square Project" (1996-1998). The redevelopment project of Trafalgar Square was obtained by analysing the urban movement flows counted manually by the Space Syntax team, with the aim of analysing access to the square and the relationship between pedestrian and vehicle movements in order to obtain, through expert choices design, an improvement in the perception of historic buildings in the area, enhancing public transport and increasing the quality of urban life. The analysis of pedestrian movement flows has identified a general congestion in the urban area, with non-existent access for pedestrians, which favoured "illegal" and dangerous road passages. With this image (Figure 3), Foster at the "Space Syntax First International Symposium" in London, showed how, a design based on the study of urban pedestrian movement flows, can really regulate the use of urban space in relation to its use, giving evidence of how the mapping tool is, to all effects, an excellent design tool, analysing and designing the "urban container", passing through the "content"[10].

Conclusions

In conclusion, we can therefore say that the mapping of movement flows is an effective tool that puts the information obtained by reading the urban fabric into a system, giving order and hierarchy to the "Mapping Urbanities". The flows constitute that summary indicator that brings us back to the values of nodality and antinodality present in the urban fabric, declaring in fact relationships and synergies of the city, alive in its urban and social part. The reading of flows is therefore a new guiding tool for addressing all urban strategies, as well as a tool for measuring and evaluating public space, effective both in terms of a new project and much more in existing contexts, thus becoming an effective indicator for the urban project.

426   ISUFitaly_2020   **URBAN SUBSTRATA** | Morphological legacies
& and
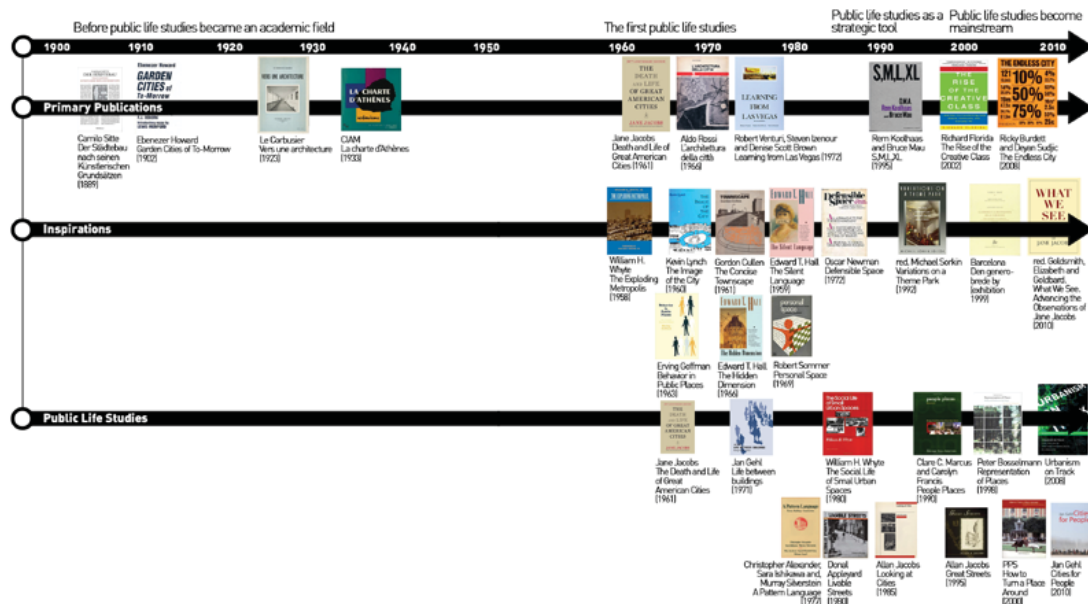**CITY REGENERATION** | design tools

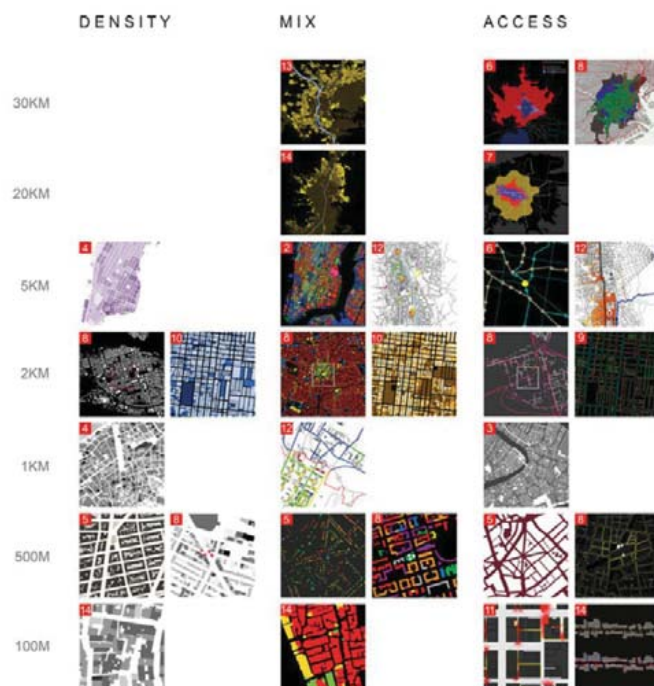**Figure 1.** Seminal works relating to urban life studies

Figure 2. Urban DMA

Figure 3. Comparative image of urban life before and after the design hypothesis in the case study analyzed in Trafalgar Square by Space Syntax and Norman Foster.

Footnotes

[1] In this investigation, the role of mapping in understanding complex relationships between spatiality and sociality of the city is based on a way of thinking about urban space that can be defined as "AssemblageThinking", developed mainly by Deleuze and Guattari in the book "A Thousand Plateaus" (1987). Assemblage Thinking is a relationship research practice rather than simply looking at things, trying to understand how urban alliances, synergies and symbioses work.

[2] Reference from "A New Philosophy of Society: Assemblage Theory and Social Complexity", by Manuel De Landa, 2005.

[3] Reference from "Assemblage Thinking and the City: Implications for Urban Studies", by Hesam Kamalipour and Nastaran Peimani, 2015

[4] Reference taken from "Mapping Urbanities: morphologies, flows, possibilities", by Kim Dovey, Elek Pafka and Mirjana Ristic, 2018

[5] The bibliographic timeline was extracted from the book "How to Study Public Life", by Jan Gehl and Birgitte Svarre, 2013

[6] Definition of mapping from the text "Mapping Urbanities: morphologies, flows, possibilities", by Kim Dovey, Elek Pafka and Mirjana Ristic, 2018

[7] The concept of "Urban DMA" was defined by Kim Dovey in the text Urban Design Thinking A Conceptual Toolkit (2016). Big cities and neighborhoods always have a particular type of urban intensity - what we might call the "character", the "buzz" or the "atmosphere" that emerges over time. Although unique in many respects, large cities also have some things in common. One way to understand these properties is to think of the "urban DMA" of a city: its density, its functional mix and its accesses.

[8] The comparison between "Urban DMA" and "Human DNA" is present in the text "Mapping Urbanities: morphologies, flows, possibilities", by Kim Dovey, Elek Pafka and Mirjana Ristic, 2018

[9] From "Schematic Thinking" to "Assembling Thinking". Kim Dovey, Elek Pafka and Mirjana Ristic's theories on Mapping and "Assembly Thinking" in "Mapping Urbanities: morphologies, flows, possibilities", by Kim Dovey, Elek Pafka and Mirjana Ristic, 2018

[10] Image and reference obtained from the publication of Sir Norman Foster's Opening Address at the Space Syntax First International Symposium, London 1997

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A green legacy: the transformation of eighteenth century parks into the new British universities of the 1960s

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Abstract

The need to expand the access to higher education in Britain after World War II led to the extension of a number of existing colleges and to the creation of seven new universities within a 250 Kilometer radius around London. Since the financing body, the University Grants Committee, asked for these new universities to be on the outskirts of existing towns -to allow for expansion- and to provide a site of at least 200 acres (around 80 hectares), many promoting committees resorted to existing eighteenth century parks, which were no longer profitable as agrarian estates or had become too close to the urban realm. In their academic programmes, the new universities of the 1960s aimed at breaking with the past with a multidisciplinary approach that was reflected in its ground-breaking architecture. However, the fact that the university sites were frequently landscape parks with mature tree structures was acknowledged quite differently by architects and landscape designers in each case. This paper explores how eighteenth century parks were transformed to host a new use, a larger scale and a higher density, analyzing which features were retained and what role these inherited landscapes assumed in the overall image of the new universities.

After World War II, British authorities became aware of the need to open up its system of higher education in order to regain its international leadership in the technological and scientific fields. The elitist university tradition represented by Oxford and Cambridge was to give way to a more democratic system that aimed at granting access to all those qualified by merit. Several colleges were promoted to university status, while seven universities were created anew within a 250 Kilometer radius around London (Muthesius, 2000). These were the universities of East Anglia, Essex, Kent, Lancaster, Sussex, Warwick and York and were soon branded as the plateglass universities for their modern architecture (Beloff 1968). This modern architecture was to represent the new teaching programs that strived toward a multidisciplinary aproach. Promoted through the University Grants Committee, the new universities were to be established near existing towns on large plots of land to eventually allow for further expansion. Since the minimum size was of about 80 hectares, former eighteenth century landscape parks were often the most suitable sites for the task, their green features providing a mature landscape from the very start. However, this green heritage was acknowledged quite differently by architects and landscape designers in each case. This paper explores how the surviving features of eighteenth century parks were involved or excluded from the university schemes and to what extent they became representative of these new institutions. For this purpose, the grounds of the University of East Anglia, the University of Sussex and the University of Essex will be examined and compared.

British eighteenth century parks: elements and systems

Eighteenth century landscape parks are one of Britain's most outstanding contributions to Western culture. As part of large rural estates, they integrated cattle husbandry, agriculture, forestry and many other rural tasks into a comprehensive work of art that synthetized the British landscape as a symbol of cultural identity. From 1700 on, they evolved from the more formal schemes of the baroque to free compositions of trees, lawns and lakes that codified the elements of the English landscape. Their winding paths, serpentine streams and undulating slopes epitomized the ideals of the new society that flourished after the Glorious Revolution under a parliamentary democracy. Thrust by the economic bounty of colonial expansion and by the principles of the Enlightenment, a liberal gentry –mainly based in the countryside- emerged, striving toward cultural independence from the continent. The English countryside was praised for its beauty but also as the symbol of a free-thinking nation.

Around 1750 the English countryside was to undergo major changes in its appearance. The Industrial Revolution introduced large-scale transformations in the transportation systems, mainly hard-surfaced roads and canals, while factories increased their scale and presence in the urban and rural profiles. Additionally, the so-called Enclosure Acts that transformed the commons into private property helped to establish larger estates that could be managed more efficiently. The open fields and winding dust tracks of the previous century gave way to a pattern of large plots where the technical and scientific findings of the time were put into practice (Steenbergen and Reh, 1996). Along with improved plough types (Tull, 1751), fertilizing and draining techniques, a new system of crop rotation was put into practice, which resulted in an extraordinary increase in crop yields (Martins, 1990). Instead of yearly alternating cultivation with fallow, a rotating system was used to grow wheat, turnip, barley and clover to raise fertility and diminish plagues. Thus, country estates became increasingly attractive as an investment and income source, but also as theatres where national pride, Enlightenment ideals and a new aesthetic could be displayed.

These country properties were consequently improved, their gardens now becoming part of a system that stretched over the whole estate. Their boundaries were initially outlined with fast-growing plantings such as hawthorn, but they were soon replaced by sunken fences or ha-has: large ditches often overgrown with bramble and other thorny species to prevent animals and intruders from entering the grounds but allowing to enjoy the distant views. The garden became a park that merged with the surrounding landscape. Along with native, deciduous trees such as oak, elm, beech or hornbeam, the country's

colonial expansion and the owners' fondness for the Grand Tour helped to introduce new species that often contrasted against this background. Within this setting, the park was no longer a painting to be contemplated from the house but a three-dimensional work of art to be experienced in movement. It was often organized around two types of circuits, a walk closer to the house, which usually gathered the more symbolic elements of the garden into scenes or thematic percourses, and a more extended trail stretching over the whole property, which was to be toured by horse or carriage. Often, a ha-ha separated both circuits, so as to prevent deer and cattle from coming close to the house, while visually linking the garden with the distant views.

Leaving behind the geometrical control of the land of French Baroque gardens, the vast space within British enclosures was structured by carefully placing the trees. Thus, belts defined losely connected glades where copses and single trees would outline spatial layers at different intervals building an pictorial perspective, like in the landscape paintings of Salvatore Rossa or Claude Lorrain. The house and some other pavilions would accentuate this scenery in an irregular, asymmetrical way, while dams transformed small streams into lakes mostly connected to the main house by a sloping lawn. Dynamic perspective and fluid space were tested in these eighteenth century parks well before these issues were translated into architecture.

During the following century, growing industrialization shifted the sources of economic production toward the urban realm with country estates entering a period of slow decay. Many of them were to find an abrupt end during both World Wars, when gardens, fields and forests were requisitioned for military purposes and urban expansion threatened to engulf the once idyllic retreats.

The park revisited: University of East Anglia

This was the case of the Earlham Estate on the outskirts of Norwich. Placed on high ground overlooking the River Yare, it comprised some 80 hectares of land around a house to the west of the city centre, along the southern flank of Watton Road.

A manor house seems to have existed on the premises since the sixteenth century, which was subsequently transformed and extended with two perpendicular wings a century later. By the end of the eighteenth century, the house and its grounds were leased to the Gurneys, a family of bankers that rented the property until the early twentieth century. They transformed the property into an agrarian estate with pleasure grounds and a park (Hogget and Williamson, 2006).

The main access was placed on Watton Road with a carriageway flanked by what was probably a wilderness, an ornamental wood which was depicted in a sketch by Humphrey Prideaux of c. 1725. The area around the house was laid out as a pleasure garden, a rectangular precinct surrounded by a ha-ha featuring a wooden fence along its baseline to keep livestock away, as a painting by Mrs. F. Cunningham shows (Cunningham, n. d.). To the south, these pleasure gardens consisted of an open expanse of lawn flanked by shrubs and trees –mainly oak and larch- so as to frame the views onto the river. According to William Faden's county map of 1797, the park seems to have spanned initially form the ha-ha almost to the river course but an important part to the south was later transformed into arable fields with occasional clumps and groves of trees, as well as pits for the extraction of gravel or marl. This more utilitarian part of the estate continued to be part of the landscape to be contemplated from the pleasure gardens as a ferme ornée, a farm designed for utility and beauty (Jellicoe 1991: 186). This visual link between the park and the fields would become obstructed in the second half of the nineteenth century, when a tree belt segregated the park from the farmland, as the Ordinance Survey Map of 1887 shows (figure 1).

The estate was finally sold to the Norwich City Council in 1924 and 120 hectares of farmland were turned into a municipal golf course between 1932 and 1966 (Golf's Missing Links, n.d.). Belts of coniferous trees were planted then to organize the grounds in parallel fairways and greens descending in bands from the park's southern tree belt down to the River Yare. It was in this part south of the Earlham Park where the University of East Anglia would eventually be located.

The golf course was closed in 1966 so the grounds could host Denys Lasdun's design for the University of East Anglia. A former World War II airfield builder, he started by exploring the grounds by foot and helicopter so he could grasp the spatial structure of the site (Hairwood, 2015: 261). He summarized his impressions on a plan entitled "Physical Factors", where he registered the features he was willing to keep and the views he found relevant (Lasdun, AR DL PA 2124/5(8)). The tree belt that once separated the park from the farmland was now to become the backbone of the new teaching facilities, while the residential ziggurats followed the contours of the terrain sloping down to the river. He further retained a former marl pit that had already been depicted in maps since the nineteenth century. His first idea was to turn it into an open-air rostrum. The ziggurats would dialog with the undulating banks of the river.

The postwar urge to provide access to higher education for a greater section of the population, lead both promoters and architects to concentrate on the architecture of these new universities (Muthesius, 2000). However, Lasdun acknowledged the beauty of the site and asked for a landscape designer to collaborate in the planning. Brenda Colvin, who was already acquainted with the large-scale commissions of the postwar, such as reservoirs, power stations or new towns (Gibson, 2011), was called in when the initial building scheme had already been established, but she further emphasized the distinct character of the ecosystems on the site: the tree belts on the high ground, the fields sloping south toward the river, the marshland on its banks. She kept a hedgerow –probably a former field boundary- as a screen separating the southern slope from the marshland and the marl pit in its natural state (Colvin, 1967), while she, together with her partner Hal Moggridge, piled the excavated earth from the building works next to it, so as to provide a prospect overlooking the whole estate (Colvin and Moggridge, 1970, AR COL DOI 1/2/21). She further planned to transform a section of the river into a Broad, a shallow lake which is typical of the Norfolk region, usually originated from peat and gravel extraction. This was finally realized at a slightly different position by Rosamunde Codling, a landscape designer who worked for Bernard Feilden, the architect who took over the university planning after Lasdun left in 1968. The Broad put a visual end to the span of grass that connected the buildings with the river and became the focal point of the whole ensemble. Codling also used the hedgerow to outline its northern bank and she recovered another feature from the previous estate: a copse which was to be seen in plans since at least 1829 and that was now to preside over the main square of the new university (Codling, c. 1970s, UEA COD). The architect and the landscape designers retained relevant features of the previous landscape and supplemented them with new ones to reinterpret the typical arrangement of the eighteenth century park –the tree belt, the mound, the house, the lawn and the lake- for a larger scale and a new use; one that looked up to the future without forgetting the past.

A tree belt structure: University of Sussex
A similar understanding of the inherited landscape was shown by architect Basil Spence and landscape designer Sylvia Crowe when inserting the new headquarters of the University of Sussex within the former Stanmer estate from 1959 on (Spence, 1966). The enclave was part of the South Downs in southern England, a landscape of soft, turf-covered hills where sheep graze among occasional woods and hedgerows. Of medieval origin, Stanmer was included in the Domesday Book (1086) and described as one of the most important estates around Brighton, but it was to live its heyday in the eighteenth century, when the Pelham family bought the medieval hamlet and added further properties to it. A neopalladian house was built in the 1720s by French architect Nicolas Dubois, who added the gardens around the house and larger scale landscaping, water courses, a bowling green and a walled kitchen garden (Brighton & Hove 2010: 4). The grounds were subsequently transformed in the 1770s as an ornamental farmland featuring strategically placed trees, clumps and belts to esthetically improve the views. Placed at the head of one of the dry valleys that cross the area in a northwest-southeast direction, the prospect was framed by the soft parallel slopes which are topped by woodland.

Stanmer village was further extended during the nineteenth and early twentieth cen-

turies and the estate remained in the hands of the Pelham family until it was requisitioned in 1942 by the war office. It was sold to the Brighton Corporation in 1947 to provide recreation space for the city in prevision of urban expansion (Gray, 2011). About a decade later, a section to the east of the estate was allotted to host the University of Sussex in a dry valley running parallel to the one where Stanmer House was placed. Both valleys were separated by Richmond Hill, a long ridge covered by woodland. A hedgerow at the bottom of the eastern valley and a belt on top of the next ridge further enhanced the topography of the site. This inherited tree structure in parallel bands running in a north-west to south-east direction was to become the articulating device for the campus future development (figure 2).

From 1959, the new university was organized as a cluster of independent brick buildings –mostly featuring patios as a modern version of the Oxford quad-, which were loosely arranged around a green core at the base of the valley, with the wood on the western ridge and the tree belt on the eastern ridge performing as visual screens that channeled the views to the south. The hedgerow at the base of the valley was to become the green spine that connected the public core with the more domestic realm of the student dormitories, which were placed further north (Spence, 1966). Another feature of the former estate, the so-called Russell's Clump (OS 6-inch, 1888), was used to visually counterbalance the long volume of the Library, which flanked the main core half way up the western slope. By incorporating previous green features into the new scheme both designers put into practice what Sylvia Crowe had promoted in her seminal book Tomorrow's Landscape (Crowe, 1956). In this text, she claimed that universities and other large-scale postwar structures were not to be concealed but integrated into the existing landscape, so they could harmonize with the overall pattern. This sensitive attitude toward the landscape of the Downs has conferred the campus with a sense of place that is still to be felt despite the university's further extension.

A green backdrop: University of Essex

Unlike these landscaped schemes, the University of Essex opted for an urban layout that reinterpreted the traditional quads at Oxford and Cambridge in a modern way. The starting point was again an eighteenth century park, the Wivenhoe Estate, located some 5 km east of Colchester, on the opposite side of the River Colne. Stretching over a plateau overlooking the river, the site was cut by a small valley where the central axis of the university would eventually be laid.

The history of the estate can be traced back to 1734, when a first property was initially acquired by the Rebow family and subsequently enlarged by further purchases. A mansion was erected on the grounds by architect Thomas Reynolds around 1759, while the site was improved by Richard Woods in the 1770s to the taste of the time. It was then when the boundaries were outlined with tree belts, and the pleasure grounds laid out on the southeastern front of the house and separated from the surrounding deer park with a ha-ha. On the opposite side of the house, a series of dams were built in order to transform the brook into two lakes. A third one was planned but it was not realized, in an area which was occupied by a walled kitchen garden. Richard Woods designed a grotto, a canal and a fish pond and cleared a lawn to connect the house with the water (Feesey, 1963). It was this landscape that was depicted by John Constable in "Wivenhoe Park, Essex" in 1816 (figure 3).

The park was to undergo major changes along the nineteenth century, when from 1846 further farms were bought to enlarge the estate westward, and evergreens were planted in the park and roses in the garden. By the 1880s, the railway line severed the estate from the River Colne banks. It was later sold to the Gooch family in 1902, who kept the property as it was until it became an army exercise camp during World War II. The remains of the park were cultivated and turned back for pasture after the war until they were sold in 1961 to locate the University of Essex headquarters.

The scheme for the university was the outcome of the close interaction between Vice-Chancellor Albert Sloman and architect Kenneth Capon of The Architect's Co-Partnership. They both opted for an urban model despite the fact that the site was still well-

away of the city and it kept its country seat flair to a great extent (Sloman, 1964). The valley sloping down from the lakes on the plateau to the River Colne was occupied by the university's services, on top of which a series of five platforms was built. Surrounded by buildings hosting the different departments, the platforms became a sequence of enclosed squares at different levels with cafés and restaurants that provided the atmosphere of an academic town even when classes were over. Flanking this urban spine on both sides, a series of towers would host the student flats. As it was often the case, a landscape architect started to collaborate once the architectural layout had been fixed. Michael Brown, an architect who had studied environmental design with Ian McHarg at the University of Pennsylvania analyzed the site and delivered a landscape proposal that tried to improve the climatic conditions of squares and courtyards, while attempting to conceal the carparks from view (Brown, 1965a and 1965b). However, little was done with the existing landscape park. The surplus clay from the buildings' foundations was used to build up a third lake at the top of the central axis, where the library and a theater were planned. This was meant to link the urban spine of the new premises with the existing park. However, only the library was realized, so the park could not become truly integrated into the university scheme, performing as a mere green background for the new structures (AR BRO DOI/1/6 1 of 2).

An underestimated heritage?

Thus, despite the fact that many of the new universities could enjoy mature landscapes from the very start, they did not always take advantage of the existing features to the same extent. While all participants in the process of making these new universities –authorities, Vice-Chancellors, architects and landscape designers- were all well aware of the significance of the eighteenth century parks, the postwar urge to improve Britain's scientific capacities by increasing access to higher education in all sections of the population prioritized building over other issues. Unlike other major building tasks of the postwar, such as power stations (Collens and Powell, 1999), the collaboration between landscape designers and planners was not contemplated from the beginning. However, the need to deal with the existing landscape was soon acknowledged by the architects in charge of the new campuses, who often paid for landscape designers to take part in the planning well before they were hired by the universities, as it was the case with Denys Lasdun and Brenda Colvin at the University of East Anglia.

Usually well away from the manor houses and pleasure gardens, the new universities frequently occupied the most remote areas of these eighteenth century estates, where the site was less designed. Still, the visual structure of the groups and screens of trees in this areas provided a valuable starting point for the new architectural schemes. The tree screen that once separated the park from the farmland in Earlham became the green backbone of the department buildings at the University of East Anglia, while the copse was interpreted anew as the green core of the university's main square and the marl pit reused as a visual counterpart of the newly created outlook onto the university premises. The wood and the tree belts that once sheltered the access roads to Stanmer Estate were kept to outline the valley's skylines at the University of Sussex, helping to integrate the new buildings into the landscape pattern of the South Downs. Further, Russell's Clump was used to visually compensate the horizontal mass of the library and the existing hedgerow at the base of the valley was turned into a green avenue that linked the different areas into a comprehensive whole. At the University of Essex, the park was preserved aside as a counterpart of the urban spine where students were expected to spend most of their time; a green oasis retrieved from the daily hustle of academic life. Although the new universities did not take full advantage of their privileged sites, they do show the value of the underestimated heritage of the green structures that landscape parks provide and point at ways of integrating their main elements for a new purpose and a new time.
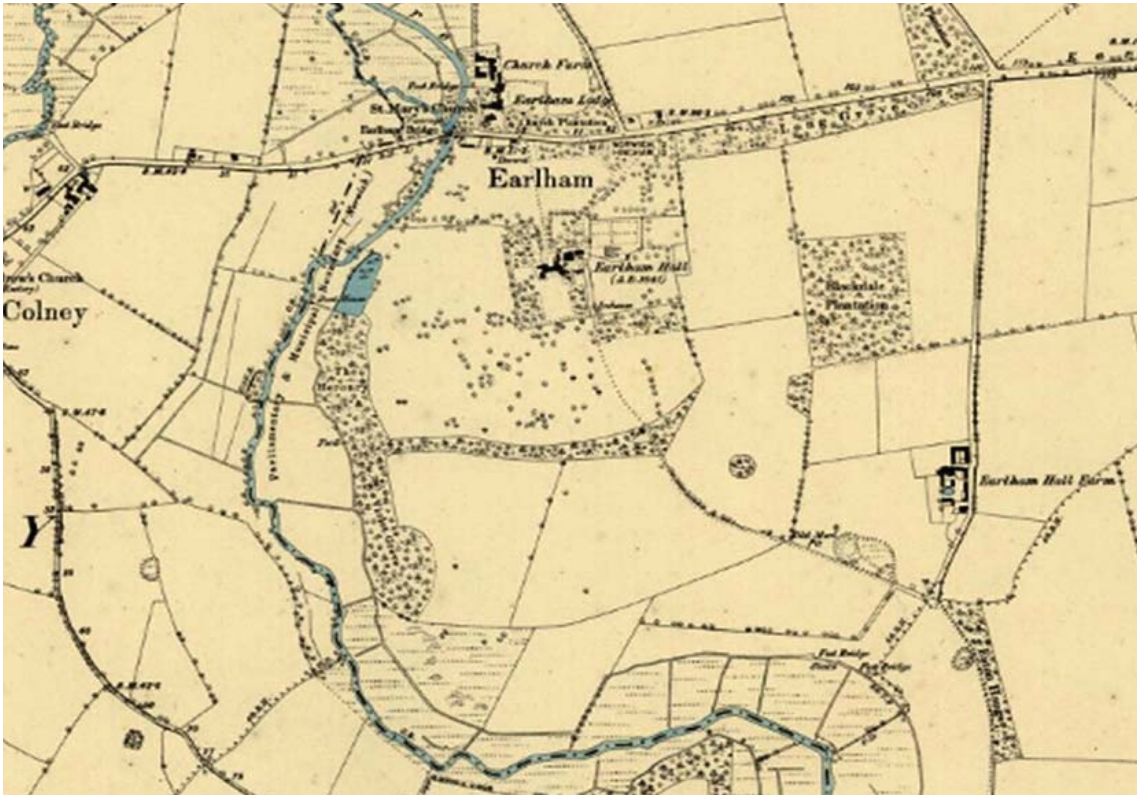
Figure 1. OS six-inch England and Wales, Norfolk LXIII.SW, surveyed 1880-1884, published 1885.

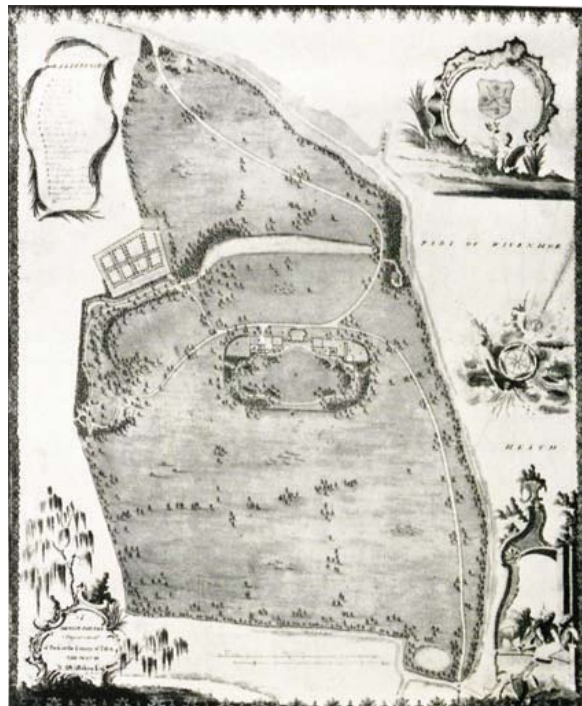**Figure 2.** (left) Budgen, T. (1797), Lewes [map], scale 2-inch to the mile.
Figure 3. (right) Richard Woods, "Proposed alterations for the Park of Wivenhoe," 1765, n. s.

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Volumes of the past, lines in the present.
Ouzai square, on the traces of the invisible streetscape of Beirut

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Keywords: *Invisible, streetscape, volume, line, imagination*

Abstract

Beirut, capital of Lebanon, had an extraordinary boom in construction after the civil war from 1975 to 1990. Lebanese and, above all, internationally renowned landscape architects have contributed to the creation of new landscapes under the control of Solidere, a private company that has appropriated all the historical center of Beirut.

Among these new developments, let's mention the project won by Martha Schwartz and Partners.

It is about an open space at the southern entrance to Beirut Souk: Imam Ouzai Square, also known as Zawiyat Ibn Iraq Square in reference to the present monument. Martha Schwartz, through her design tries to put in front the past history of the city. In order to create continuity with historical landscape through contemporary design, the main idea was to highlight the buried old Roman pavement, into lines in the floor surface of the current square. Thus, Ouzai square appears on the traces of the invisible streetscape of Beirut.

From parameters identified by spatial and social approaches we tried to uncover:

What is the interest of this intervention at the spatial level? What contribution do these lines offer to the streetscape? How can an invisible volume be read from a visible line?

What is the interest of this intervention at the social level? How does a simple line become a tool for creating continuity? How does this intervention allow people to imagine, care, defend and be curious about the landscape? How does this intervention contribute to the creation of their landscape?

In this way, various results could be listed: - The role of pavement in the square - The continuity with historical landscape through contemporary design - Volumes of the past, lines in the present - Imagine, and be curious to care and defend their own landscape - Ouzai square, on the traces of the invisible streetscape of Beirut.

Introduction

Beirut, capital of Lebanon, had an extraordinary boom in construction after the civil war from 1975 to 1990. Lebanese and, above all, internationally renowned landscape architects have contributed to the creation of new landscapes under the control of Solidere, a private company that has appropriated all the historical center of Beirut.

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It is about an open space at the southern entrance to Beirut Souk: Imam Ouzai Square, also known as Zawiyat Ibn Iraq Square in reference to the present monument. Martha Schwartz, through her design tries to put in front the past history of the city. In order to create continuity with historical landscape through contemporary design, the main idea was to highlight the buried old Roman pavement, into lines in the floor surface of the current square. Thereby, Ouzai square appears on the traces of the invisible streetscape of Beirut.

To understand this phenomenon, a critical analysis is considered, based on parameters identified by spatial and social approaches.

Thus, we opt the article plan in three parts -The first one is entitled - The role of pavement in the square. Its subtitle is - The continuity with historical landscape through contemporary design. The second one is - The methodology from a spatial approach and from a social approach. And the third one is a synthesis where various results could be listed: Volumes of the past, lines in the present - Imagine, and be curious to care and defend their own landscape - Ouzai square, on the traces of the invisible streetscape of Beirut.

The role of pavement in the square

In this paragraph, we recognize two important words, reflecting our case study, which deserve to be defined as a function and as a value. The first is the square and the second is the pavement.

By definition, "The square was probably the first organizing form of urban space and the street was an extension of the square once the periphery had been filled with houses" (Trancik, 1986, p. 67). Likewise, according to that given in the book (Chahine, 2019, p.31) "The street is a place of passage, but when it marks a break, it becomes the square. In the squares, passers-by stop, sit down, and rest", watch each other, do business and gather. In this way, the squares became the potential to be powerful statements of a city's history, identity, and values; and adapted to cultural and economic realities. According to Lynch (Lynch, 1960, p. 102), the square is "a conceptual anchor point" or a node of activity, often at the intersection of major pedestrian routes. It may also serve as a landmark. Its connection to the street and to other nodes in the urban network are important factors in its success or failure (Trancik, 1986; Whyte, 1980). Then, the square has the function of rest, of identity, of economic and cultural value, and designers have the ability and the responsibility to create public spaces that are more than just functional and beautiful – they can and should be contextual, memorable, and meaningful, reflecting the history of the city like Martha Schwartz in Imam Ouzai square in Beirut.

Regarding the second important word in our study, the pavement as summarized by Beazley (1960), provide a hard, dry, non-slippery, load-bearing surface; guide or restrict pedestrian traffic flows, encourage slowing or stopping, with non-directional pattern; reduce the scale of urban space to human proportions with appropriate activity; and reinforce the existing visual style of a space. Also, "In a manner of speaking, and by no means all metaphorically, floors and pavements are the touchstones of a civilization" (Rudofsky, 1969, p. 276).

But there are roles and values of pavement, still according to Beazley, especially when it comes to a square. In this way, the role of pavement could be as a human scale element in large spaces, as a stimulus of multiple senses, as a cue to movement, as a pattern for pattern's sake, as a carrier of information and meaning, as a permanent landscape feature, as an expression of the earth beneath it, and as a unifying or integrating element. Then, the pavement is an essential element in the square, it allows its integration in the context. Through the pavement, Martha Schwartz highlight the buried old Roman pavement, into lines in the floor surface of the current square. Then, the mixture of the two important words, square and pavement, creates what we call a Continuity.

The continuity with historical landscape through contemporary design.

Martha Schwartz in Imam Ouzai square in Beirut, through her design tried to put in front the past history of the city. She represents the Volumes of the past, into lines in the present in order to create a continuity with historical landscape through her contemporary design. In the same way, as mentioned in the synthesis of the book (Chahine, 2019, p.165) it is not just about making a functional and aesthetic design, but above all a meaningful square, which reflects the spirit of the place, which tells the story of a people, or even civilizations like the case with Imam Ouzai square. In this sense, what can be our methodology?

Methodology

A critical analysis is considered, based on parameters identified by spatial and social approaches, to try to uncover:

What is the interest of this intervention at the spatial level? What contribution do these lines offer to the streetscape? How can an invisible volume be read from a visible line?

What is the interest of this intervention at the social level? How does a simple line become a tool for creating continuity? How does this intervention allow people to imagine, care, defend and be curious about the landscape? How does this intervention contribute to the creation of their landscape?

From a Spatial approach

On mid-December 2019, there were site visits. The area designed by Martha Schwartz is about 1671 sqm. It is an important open space at the southern entrance to Beirut Souk from Rue Weygand: Imam Ouzai Square, also known as Zawiyat Ibn Iraq Square in reference to the present monument. This square constitutes the main entrance from the south and offers passages to the Tawila, Sayyour, and Jewelers' souks (names of souks that made the reputation of the golden age of Beirut downtown before the war) also renovated following a competition launched by Solidère. The pavement is tiled with black basalt, includes an oval outlines of the old Roman pavement. It integrates features from the site heritage together with elements of modernity. It is mostly mineral, except the solitary tree; the important thing in the use of nature in urban areas is not its quantity but its usefulness (Chahine, 2019, p.35). In Imam Ouzaï square the solitary tree demarcates the space. It is alone and very important. Some users take advantage of its shade to rest. In this square there was more an architectural intervention than plant with the reproduction of the old roman pavement by the white traces on the ground. This square has more the function of a place for crossing than a place to rest. The furniture is not insured for sitting and resting, except for the edge around the solitary tree generated from Schwartz's study.

From one side, the only architectures of this square are a small domed on the right of the south entrance, and a cupola-topped prayer on the left, remains of the late Mamluk zawiya (prayer corner) of Ibn Arraq Al-Dimashqi, a religious authority, born in Damascus. In 1517, he built a house and a ribat (hospice) in Beirut. It is recorded that he chose this location to be near the former house of Imam Abd Al-Rahman al-Ouzai dating from the 8th century, whose reputation for holiness and justice spread throughout the Muslim world. Ibn Arraq died in Mecca in 1526. His house remained a private madrasa (college of jurisprudence) and a zawiya for his followers (Hallaq, 1987).

From another side, Imam Ouzai square is part of Beirut heritage trail, 2.5 km walking circuit in the historic core of the Beirut downtown. Beirut, the capital and the largest city of Lebanon, has hosted successive historic periods of major powers and civilizations in the Mediterranean and West Asia. It has layers of Phoenician, Hellenistic, Roman, Byzantine, Arabic, Crusader, Mamluk, Ottoman and French Mandate periods (Chahine, 2019, p.18). A bronze medallion is embedded into the sidewalk. The Beirut Heritage Trail, a project by Solidere in collaboration with the Ministry of Culture, Directorate General of Antiquities and the Municipality of Beirut, links archeological sites, historic public spaces and heritage buildings. Celebrating the multi-layers of Beirut's rich heritage, the Beirut Heritage Trail reveals the story of 5,000 years of history and takes the visitor through a historic journey of the key sites and monuments.

The circuit starts at the Beirut Souks, which retain the 2,500-year-old ancient street grid

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and Ottoman access gates, and incorporate several archeological remains including the Phoenico-Persian quarter, the city walls and moat, our site study Mamluk Zawiyat Ibn Iraq, and Majidiya mosque. Among the sites featured in the trail are the Emir Munzer mosque, the Roman Baths, Riad El Solh Square and the Grand Theatre.

Following the line, visitors imagine the invisible volume. The volume of the past city is now in the new city represented by lines. The white lines on the floor refers to the walls that existed, there, long time ago. An invisible streetscape incapable by nature of being seen, not perceptible by the eye, is perceptible by the imagination. To the point that allows seeing the invisible through the line, the volume, the traces, by imagination and continuity.

It reminds us of Michel Henry, one of the leading French philosophers of the twentieth century. In his oeuvre Seeing the Invisible (Henry, 2009, p. 108), the author appears engaged in the field of aesthetics. Through an analysis of the life and works of Wassily Kandinsky (Russian painter and art theorist, credited as the pioneer of abstract art), Henry uncovers the philosophical significance of Kandinsky's revolution in painting: that abstract art reveals the invisible essence of life. Henry shows that Kandinsky separates color and line from the constraints of visible form and, in so doing, conveys the invisible intensity of life. More than just a study of art history, the artist is engaged in painting the invisible and offers invaluable methodological clues for Henry's own phenomenology of the invisible. Henry defines the imagination, as a creative, even a radical sense that gives a positivity that was not glimpsed by classical thought. Art's creative has ceased to be, according to Kant's famous definition, the faculty of representing a thing in its absence. It has become the magical power of making something real.

This is what Martha Schwartz, through her design tries to put in front the past history of the city. In order to create continuity with historical landscape through contemporary design, using imagination. The Volumes of the past are represented by lines in the present. Ouzai square appears on the traces of the invisible streetscape of Beirut.

From a Social Approach

For a few days, from September to December 2019 at different times, there were visits to the site where surveys and meetings were held. The purpose was to evaluate the imagination of passerby and the meaning, according to them, of the lines representing the traces of the buried old Roman pavement creating the invisible streetscape in Imam Ouzai square.

The first person encountered was a taxi driver. Stopped in rue Weygand to catch client, in the southern entrance to the square, he didn't know the name of the square waiting in front of it. Same for the police, asked in the street, ignore completely the name of the square. Even the costumers, all what they mention that it is the southern entrance to the souks. None knows the square by its name.

Unfortunately, when asking the surrounding community, no one could have guessed or was aware of its heritage nor its historical value. Interviewing around 23 people, none gave any supportive information considering the site. Only few knew its name and mentioned the fact that it's dedicated to an important religious reference. Others' assumptions about the white tiles printed on the floor included random, creative architectural design and electricity underground cables' pathway.

But, there was a couple mid seventy years old, who now lives abroad, comes to Beirut only during holidays. They used to come to this place before the civil war. They explain how pretty was this area, and how is different now. But they enjoy the traces on the pavement, and for them, the contemporary design gives value to the buried underground roman pavement, informed from Beirut heritage trail. Same thing, a group of tourist local and foreign, they were for a circuit with Beirut heritage trail, and they know about the lines and their representation. For them, the landscape architect used carefully the historical potential of the site and gave value to it. They can imagine through the design the roman pavement and the volume of the past. For them, it is important to represent the previous landscape to imagine how it was, and seeing the invisible streetscape. Imagination is part of the landscape; it let people see what is not real or exist anymore. It let people to be curious, to care and defend their own landscape. Once they are informed, they enjoy the current design.

So only people through Beirut heritage trail know about the roman pavement. Otherwise,

passerby doesn't care, even if he sits for a rest in front of the white lines.

Synthesis

Thereby from these two approaches, the historical landscape and contemporary design has a big value through the Martha Schwartz study.

From the spatial approach, we saw how the landscape architect tries to put in front the past history of the city. In order to create continuity with historical landscape through contemporary design, using imagination. As shown in the analysis, the volumes of the past are represented by lines in the present. Also we saw the closed relation between the imagination and the invisible as explained by Henry through the oeuvre of Kandinsky.

From the social approach it appears that only people through Beirut heritage trail know about the roman pavement. Otherwise, passerby don't care, even if they sit for a rest in front of the white lines. For those informed, the landscape architect used carefully the historical potential of the site and gave value to it. In this way, they can imagine through the design the roman pavement and the volume of the past. For them, it is important to represent the previous landscape to imagine how it was, and seeing the invisible streetscape. Imagination is part of the landscape; it let people see what is not real or exist anymore. It let people to be curious, to care and defend their own landscape.

From that, we will enumerate some results:

- Volumes of the past, lines in the present - Imagine, and be curious to care and defend their own landscape - Ouzai square, on the traces of the invisible streetscape of Beirut.

Conclusion

Thus, the project won, in Beirut, by Martha Schwartz and Partners deserve to be mentioned among the most successful competition project launched by solidere.

Imam Ouzai Square, also known as Zawiyat Ibn Iraq Square in reference to the present monument, at the southern entrance to Beirut Souk, put in front the past history of the city. In order to create continuity with historical landscape through contemporary design, the main idea was to highlight the buried old Roman pavement, into lines in the floor surface of the current square.

To understand this phenomenon, a critical analysis was considered, based on parameters identified by spatial and social approaches, where the historical landscape and contemporary design has a big value through the Martha Schwartz study.

From the spatial approach, we saw the history and the architectural element of the square. We saw also the imagination and the invisible of Kandinsky through Henry oeuvre. From these points, we saw how the landscape architect tries to put in front the past history of the city. As shown in the anlysis, the volumes of the past are represented by lines in the present. From the social approach it appears that only people through Beirut heritage trail know about the roman pavement. For those informed, the landscape architect used carefully the historical potential of the site and gave value to it. In this way, they can imagine through the design the roman pavement and the volume of the past.Imagination is part of the landscape; it let people see what is not real or exist anymore. It let people to be curious, to care and defend their own landscape. Once they are informed, they enjoy the current design.

Thus, Volumes of the past, lines in the present. Ouzai square, on the traces of the invisible streetscape of Beirut could be a succeful example of Historical landscape and contemporary design.

Figure 1. South entrance to Imam Ouzai square. Source: Author, 2015.

Figure 2. Aerial view of the square. Source: Solidère, 2005.

Figure 3. View to the south. Source: Author, 2019; **Figure 4.**View to the East. Source: Author, 2019

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Emerging perspectives on urban morphology: collaborative learning activities fostering combined approaches

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Abstract

The *Emerging Perspectives on Urban Morphology* research project (EPUM) brings together five partners from different countries in South and Central Europe that have been promoting different morphological approaches aiming at comparing the theoretical, conceptual and methodological basis of the different approaches, identifying their main strengths and weaknesses, and exploring the possibilities to combine some of these different ways of describing, explaining and prescribing the physical form of cities through the teaching of urban morphology.

EPUM identified a need of collaborative learning spaces which will enable the exploration of the potential of combining and coordinating the different approaches while at the same time enabling the participation and collaboration of all relevant stakeholders in the debates about contemporary cities' issues. The mode of learning which proved to be suitable for such a learning platform is one that facilitates both face-to-face activities, so as to allow institutions to work independently, with on-line activities which enable the synchronous or asynchronous collaboration and learning across institutional barriers; in other words, a blended learning approach in urban form studies. The attempt to establish a network linking the different approaches, bringing together researchers, educators and learners from different institutions, geographical areas and approaches, through the development of collaborative learning activities (CLAs) in a blended learning environment, lies at the heart of this paper.

Understanding urban form – combined approaches to urban morphology

A number of approaches on understanding urban form have been developed in the past decades, responding to the diversity and complexity of human settlements and the variety of forms of socio-spatial patterns. These approaches, each with different terms of reference, are characterized by specific disciplinary and geographical trends and have often seen the emergence of separate schools of thought. Each approach tends to be associated with a main research centre or with certain individual researchers and, despite some exceptions, they have many times been applied in isolation. The teaching of urban form analysis in higher education institutions across Europe also faces the challenge of addressing contemporary cities' issues from often isolated perspectives based on the aforementioned different schools of thought, either reflecting specific national educational trends or opting for a globalized approach cutting the knots with local specificities.

As Kropf pointed out (2009) the challenge raised by the diversity of approaches in understanding and analysing urban form, lies in combining and coordinating them rather than in selecting between the different views. Kropf undertakes a critical analysis of publications representative of four dominant approaches: historico-geographical, process typological, configurational (space syntax) and spatial analytical. He firstly identifies the range of different phenomena that are the object of urban morphological enquiry; he then identifies an aspect common to all the approaches which can be used as a reference key to coordinate different views in a rigorous way; and, then, he outlines a composite view in which the different approaches support each other to provide a better understanding of human settlements. In the end, Kropf argues for the need to develop this comparative approach and analysis, pointing out that *"close examination of key texts suggests that 'urban form' is described in a number of different ways in the different approaches. The gaps do not represent insuperable barriers. Already the different approaches are broadly complementary. How could they be made more rigorously and effectively so?" (ibid: 3).*

In a similar attempt to explore the potential of combining and coordinating these approaches in order to improve our ability to describe, explain and prescribe the physical form of the city, Oliveira et al (2015) selected a key concept in each of four approaches (morphological region (historico-geographical), typological process (process typological), spatial configuration (space syntax) and cell (spatial analysis)) and applied it into a single case study in Porto. The main points of contact between the different approaches (structured in three fundamental groups: urban form elements, levels of resolution and the time factor) were identified and a generic methodological approach was proposed. These four approaches were revisited by Monteiro (2018), offering a new input to this line of research. While Oliveira et al. (2015) analysed a single case study through an isolated application of each of the four approaches, Monteiro (2018) integrated three of the approaches into a single method of explanation and prescription.

Geddes's recently completed PhD thesis is in the same line of research aiming to establish an effective way of identifying the key processes that led to the emergence and transformation of the city of Limassol by refining current ways of analysing the urban form diachronically. Through a review of key issues surrounding our understanding of the nature of cities, a theoretical framework largely based on the relational conceptualisation of cities as social assemblages is set implying a series of analytical requirements. The benefits of relevant analytical approaches and methodological tools are reviewed and, based on the requirements of the theoretical framework they are coordinated and combined. Table 1 summarises the different analytical elements (both physical and social), as well as the spatial relations, which three different analytical approaches (configurational, relational-material and historico-geographical) consider (Geddes 2017).

APPROACH	PHYSICAL FEATURES	SOCIAL FEATURES	SPATIAL RELATIONS	HUMAN-PHYSICAL RELATIONS	TEMPORAL RELATIONS
CONFIGURATIONAL APPROACH	• Street • Open Space	• Use • Occupation • Movement	• Network Structure • Interconnectivity	• Perception • Movement Economy • Cultural context	• Cyclical Growth • Diversification
RELATIONAL – MATERIAL APPROACH					
HISTORICO-GEOGRAPHICAL APPROACH	• Site • Town plan (Street, Plot, Building)	• Function • Land Use Pattern	• Street Pattern • Plot Pattern • Building Pattern	• Social and Economic Context	• Cyclical change
PROCESS-TYPOLOGICAL APPROACH	• Building • Urban Tissue • District • City	• Cultural Context • Historical Context	• Aggregation	• Intention • Construction	• Derivation (Cyclical Reproduction, Modification of Form)
SPATIAL ANALYSIS-CELLULAR AUTOMATA	• Plot • Parcel • Census Tract • Built-up Area • Route	• Use	• Network Structure	• Flows	• Feedback (Continuous Readjustment)

A diachronic analysis of the city enabled the identification of key synthesising mechanisms, but also provided the tools to define the characteristics of Limassol at different points in time and ultimately what caused and led to its contemporary identity. The theoretical framework proposed, proved vital in identifying the mechanisms at work demonstrating the benefits of coordination and combination of the different analytical approaches. A number of pathways for further development of this research were also clear: a process-typological analysis for example, could bring great benefits to the understanding of the aggregation, repetition and modification of housing typologies and street layouts and so on.

The attempt to find a common ground through possible combinations of a variety of approaches within the field of urban morphology, proves to be a challenging task; but the knowledge of the strengths and the weaknesses of each approach may enable us to select the most appropriate options given the specific nature of the object under study, fostering a more holistic and integrated approach to urban form studies (Whitehand 2015, 2017).

In the same line of thought, albeit from a pedagogical perspective, EPUM identified a need of collaborative learning spaces which will enable the exploration of the potential of combining and coordinating the different approaches while at the same time enabling the participation and collaboration of all relevant stakeholders in the debates about contemporary cities' issues. The attempt to establish a network linking the different approaches, bringing together researchers, educators and learners from different institutions, geographical areas and approaches, through the development of learning platforms that foster the exchange of knowledge, providing opportunities for contact and collaboration and encouraging the dissemination of findings, lies at the heart of this paper.

The mode of learning which proved to be suitable for such learning platforms is one that facilitates both face-to-face activities, so as to allow institutions to work independently, with on-line activities which enable the synchronous or asynchronous collaboration and learning across institutional barriers; in other words, a blended learning approach in urban form studies. The possibility of a blended learning pedagogy is explored in the following sections, with reference on the implemented learning activities of the EPUM project.

Collaborative learning activities in urban form studies -a blended learning pedagogy in teaching urban morphology

Blended learning, which has gained much popularity in higher education in the past years, is a term which is endowed with multiple meanings and it has become apparent through a number of studies that different models of blending can exist at various levels. Generally speaking, it refers to a learning environment which combines face-to-face instruction with

computer-mediated instruction and it can occur by blending levels of activities, course-levels, program-levels or even institutional-levels (Graham, 2006). However, a number of studies suggest that blended learning implementations are most often used for the purposes of efficiency and supplementation, with only a low number fully exploiting the potential of this mode of learning to enhance the learning experience and initiate collaborative activities, particularly in the field of urban form studies (Driscoll 2002; Hofmann 2006). Even though we can find examples of intertwining a specific learning style with blended-learning there still is not much investigation either about the relationships between both or the potential to foster collaborations (Donnelly 2010).

As Randy and Vaughan (2008) point out, the value of blended-learning transcends the mere application of ICT for teaching and learning, "recombining concepts that were previously considered contradictory, such as collaborative-reflection and asynchronous community". What makes blended learning approach particularly important to address the issues raised by the EPUM project, is indeed the fact that it supports the implementation of a number of collaborative learning activities among partners throughout Europe facilitating a community of inquiry which is constituted above and beyond institutional and physical barriers, allowing at the same time multiple levels and types of instruction to be adopted. Learners, learning styles, academic programs, subject-matters, disciplines, and institutional frameworks can be blended (Madrazo et al 2017), providing the adequate conditions for the implementation of a "free and open dialogue, critical debate, negotiation and agreement" (ibid, p.97) between different urban form approaches in the participating institutions.

Such a learning context offers an open educational practice which helps collaborators to share freely and openly ideas, knowledge, tools, approaches and materials used in urban form studies. At the same time, it enables participating institutions to keep their own academic program, structure and curriculum; in other words, it enables the participants to work independently and collaboratively. This possibility to combine learning activities which can be carried out at different times and in different places (on-line, in the classroom) combined in interaction with other learning resources, requires specific pedagogic methodologies which take advantage of their collaborative potential and point to the creation of alternative learning environments. Such a learning environment was suggested by Punie (2007) to describe ICT-enabled educational spaces which transcend existing limits, physical, conceptual and institutional. Punie highlighted the potential of such environments to place students at the centre of the learning, enabling the personalization of learning as well as social interaction at different scales (from learning individuals and communities to learning cities and regions), while being flexible enough to integrate various learning styles, teachers' skills, and curriculums, gradually becoming informal platforms to share expertise and knowledge across organizations. In the OIKONET project, the term learning space to pursue goals which are in line with those described by Punie has been initiated in the field of housing studies (Madrazo et al 2017).

The EPUM project, identifying the lack of such collaborative, blended learning environments in the field of urban form studies, not to replace but to "extent/expand/broaden" the physical space of institutional teaching, explored the potential to link different approaches to the study of urban form in different parts of the world through a) the development of a pedagogic model which can facilitate a flexible interaction and collaborative learning activities between courses included in the academic programs of the participating institutions in relation to different approaches to the analysis of the urban form and b) the development of a collaborative digital learning platform (epumplatform.eu) to support and facilitate such a pedagogic model.

The pedagogic model proposed, aims at blending different components such as subject-matters, delivery formats, learners from different institutions and levels, learner styles. A combination of these components can be applied at session, module and programme level, in face-to-face, online or blended environments. Furthermore, the pedagogic model regards the development of a collaborative open learning curriculum (OLC) and the implementation of a blended learning environment which enables the learning activities and learning tasks to be executed across institutions. The OLC is informed by the methodology of aligned learning and teaching proposed by Biggs (Biggs et al 2007). Biggs' constructive

alignment constitutes a methodology in higher education which seeks to align elements of the educational process such as intended learning outcomes with teaching learning activities and assessment tasks. More specifically, all components in the teaching systems such as the curriculum, the intended outcomes, the teaching methods, the assessment methods as well as the evaluation are perfectly aligned to each other. This approach helps students to construct meaning through relevant learning activities and in that sense, meaning is not something imported or transmitted from teacher to learner. Instead, teaching is only a catalyst for learning which guides students to engage in learning activities.

The open learning curriculum includes both theoretical and practical learning material and focuses on (a) aligning complementary approaches to develop a comprehensive analysis of urban form and social phenomena and (b) combining on-line (digital platform) and on-site (courses and seminars taking place at the participating institutions) collaborative learning activities. The sequences of tasks (or assignments) can evolve in an open-ended manner and include both online collaborative activities and tasks (through the digital platform) and face-to-face activities and tasks (through intensive programme workshops). Building on the precedent of OIKONET, the key (to the learning process) is to intertwine the activities that can be carried out within the programme at each institution with the collaborative tasks amongst the institutions, either synchronously or asynchronously (Madrazo et al 2017). Therefore, the pedagogic model proposed for this project regards the implementation of a blended learning environment which enables various learning activities with numerous learning tasks to be executed across institutions facilitating a flexible interaction between courses included in the academic programs of the participating institutions in relation to different approaches to the analysis of the urban form. This learning structure is flexible and neutral enough so as to support different types of activities such as collaborative development of a project or even a course assignment which can be carried out by students working individually or in groups within or across institutions.

The learning structure proposed aimed at fulfilling a double purpose: to enable participating institutions to keep their own academic program and to facilitate the design and implementation of learning activities in collaboration. Learning activities carried out in the project's shared digital platform (small-scale activities) were integrated with the face-to-face activities carried out at courses of the participant institutions through open learning processes (synchronously or asynchronously) as well as in joint intensive programme workshops (large-scale activities).

The blended learning approach adopted was supported by the development of a collaborative web-based learning environment, (EPUM digital platform), aiming at breaking down institutional barriers in educational cultures through the development and use of digital learning spaces and resources, structured under specific activities in various thematic areas proposed by both professors and students, interlinked with other activities carried out at various institutions in design studios, workshops, seminars and courses. The activities are represented by modules, referred to as Collaborative Learning Activities (CLAs). CLAs offer an innovative way for collaboration in the education system, by making available resources which are accessible, not only to those enrolled in higher education programmes, but to anyone wanting to access training regardless of their geographical location, educational culture or ability to travel. The innovative framework and tools proposed comprise a visual index to students' work, providing them with the capability to upload data files to assignments, incorporating their peers' feedback and review, as well as tutors' feedback to students for their work, and the ability for discussion around any of the topics or works. Furthermore, the add-on tools provide the capability to visualize a network of activity interactions and present it in a way that it is appealing and understandable to different stakeholders, both registered and non-registered users.

Implementing collaborative learning activities in EPUM's blended learning environment

Building on the pedagogical model developed, a framework and principles for possible collaborative learning activities enabled partners to find adequate ways through which they could intertwine learning activities that could be carried out within their programme of study, either synchronously or asynchronously. In that sense, both teachers and learners

gradually developed a more comprehensive view of how each approach can enrich the understanding of the urban form and assessed the advantages and disadvantages of using different methodologies in order to address specific issues for contemporary cities.

To facilitate this understanding, the framework proposed included two types of collaborative activities: small-scale and larger-scale activities. The criteria used for the identification and eventually implementation of these common learning activities included among others the level of education (i.e if the course is offered for postgraduate/undergraduate), the type of the module (seminar, design course e.t.c) as well as the desirable learning outcomes and deliverables. These criteria assisted participants in identifying potentialities for cooperation within existing modules and seminars as well as within new modules or small-scale events (such as a lecture series) planned in the context of EPUM.

Small-scale activities facilitated by the project, refer to collaborative learning activities carried out by academic institutions, following the blended-learning approach described in the previous section. These activities aimed at enabling the gradual establishment of a network of relationships among existing courses, students and topics in the participating institutions, facilitating the study and exploration of urban form, exposing students and teachers to other approaches across institutional and geographical areas and preparing students and teachers for larger-scale activities.

Small-scale activities at all stages of the project were supported by larger-scale activities which aimed at bringing physically together researchers, educators, learners and stakeholders from different languages, geographical areas and schools of thought along with the virtual resources developed through the project. More specifically, larger-scale activities involved both online pre-workshop activities and onsite intensive workshops organised by the consortium through which empirical case studies were explored and examined by multinational and multidisciplinary teams. During these events students, teachers, researchers and other stakeholders gained adequate competences necessary so as to work in a readily accessible international environment, overcoming institutional and geographical boundaries.

In that sense, larger-scale activities, which included two international intensive workshops, aimed at: bridging together both academic participants from the various institutions as well as academic with non-academic participants; bringing academia along with stakeholders, professional and local authorities; exchanging knowledge and information between approaches; achieving mutual understanding between the different approaches; facilitating combination and coordination of the different approaches.

Exploring Porto's and Nicosia's historical urban form through a combined approach

Two transnational intensive workshops formed part of the project's larger-scale activities and focused on the study of the urban form from a multidisciplinary perspective, with the participation of multiple stakeholders. The case studies of historic Porto and Nicosia were used to develop and build knowledge of the full potential of a) combining and coordinating different approaches to urban form studies and b) shared collaborative activities in a blended learning environment.

Collaborative learning activities were designed to engage all the participants in the definition of important and timely issues to be addressed in the historic centers of the cities and took place through the exploitation of the physical space along with the virtual resources developed through the project's research outcomes. Activities and tasks during all phases evolved in an open-ended manner as the learning process progressed; they moved from the virtual to the physical spaces, depending on the intertwining of sequence of on-site courses with on-line activities. The workshops thus consisted of a combination of physical and virtual lectures, practical group learning and design tasks and critical discussions between learners and other stakeholders, including professionals, local authorities, local communities and organisations.

More specifically, the collaborative workshops were part of a sequence consisting of pre-workshop, workshop and postworkshop activities which were carried out both on-line and on-site. Pre-workshop activities took place at each institution building knowledge about the object of study and the site, through a Collaborative Learning Activity developed in the

EPUM digital platform. The preparatory activities and initial analysis of the historic centres in the participating institutions facilitated the establishment of a network of relationships amongst the courses, students and topics, facilitating the work performed collectively later onsite.

The work initially developed at a distance was shared and discussed through the digital platform and was then brought together through the onsite collaboration, where teachers and learners were involved in the development of urban strategies in multinational teams and were exposed to the different theoretical and methodological approaches. Both teachers and learners interacted with local stakeholders, beyond academia including local authorities, policy makers, local residents and social organisations to learn about and discuss the specific urban challenges in each context, through a combination of lectures, design-studio work, design critiques and social events. After the workshops, the learning process continued (post-workshop activities) and was consolidated back at each institution through online collaboration.

The main goal of the two weeks Porto Intensive Workshop was to initially be exposed to and build knowledge of the various approaches on urban form studies and then to explore the possibility to effectively combine different morphological approaches – historico-geographical approach, process-typological approach, space syntax and relational approach – in the analysis of the physical form of the historical kernel of Porto and of the main challenges that it faces today. In the first week different groups of students (London, Nicosia, Porto, Rome and Wien), supervised by different educators, applied each of the morphological approaches in isolation. The studio work was fed by different lectures by educators, practitioners from the local authority and major stakeholders, focusing on Porto urban form, agents and processes of transformation and on the four morphological approaches. Following the application of the different approaches in isolation, students worked in mixed groups, exploring the possibility of combining some approaches in the analysis of the urban form.
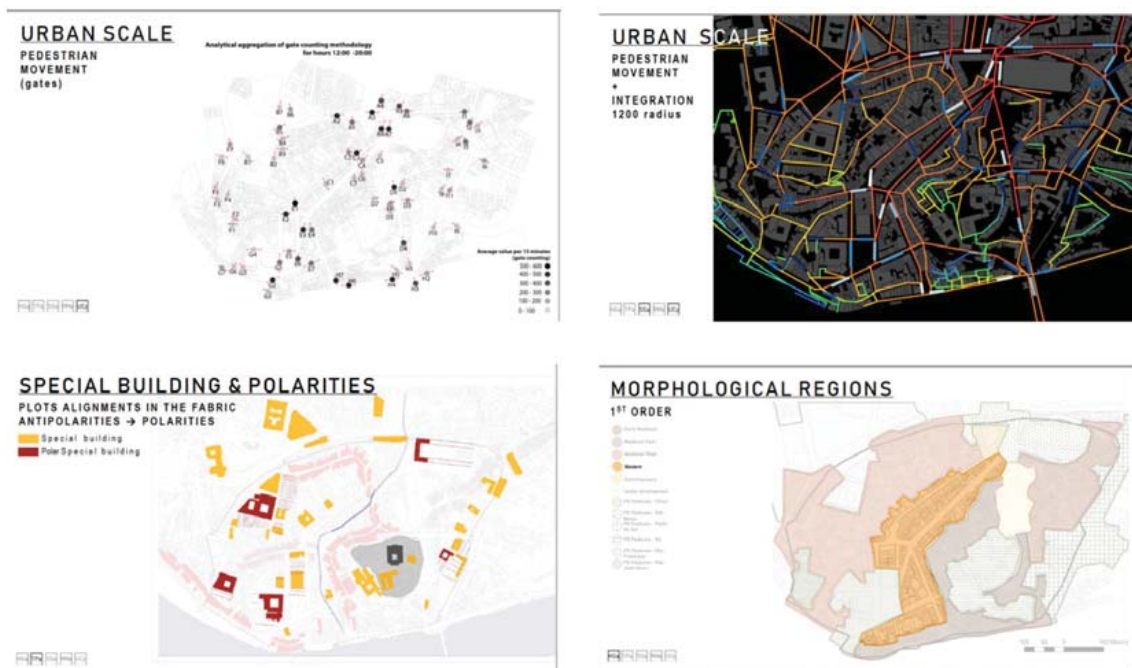
Figure 1. Analysis of Porto's historic centre.

Drawing on the results of the Porto workshop, the Nicosia Intensive Workshop aimed at effectively exploring the potential application of combined morphological approaches – historico-geographical approach, process-typological approach, space syntax and relational approach – initially in the analysis of the physical form of the divided, historical core of the city and of the main challenges that it faces today and subsequently, in the design of

one particular area of the city. Having as a starting point the complexity of factors that have shaped the city though time, the workshop sought to understand conditions of the unsettled that have shaped the city's urban form through time and the respective challenges posed today. During the first days of the workshop, mixed groups of students (London, Nicosia, Porto, Rome and Wien), explored the possibility of combining some of the different urban morphology approaches to analyse the urban form of the historic core. The analysis took into consideration pre-workshop activities at the partners' institutions, which were available at the EPUM collaborative, online platform. During the rest of the workshop, students built on a systematic reflection on the analytical work and proposed intervention strategies for conservation and/or transformation of the existing urban forms in the area of Ayios Kassianos, a neighbourhood adjacent to the city's Buffer zone.
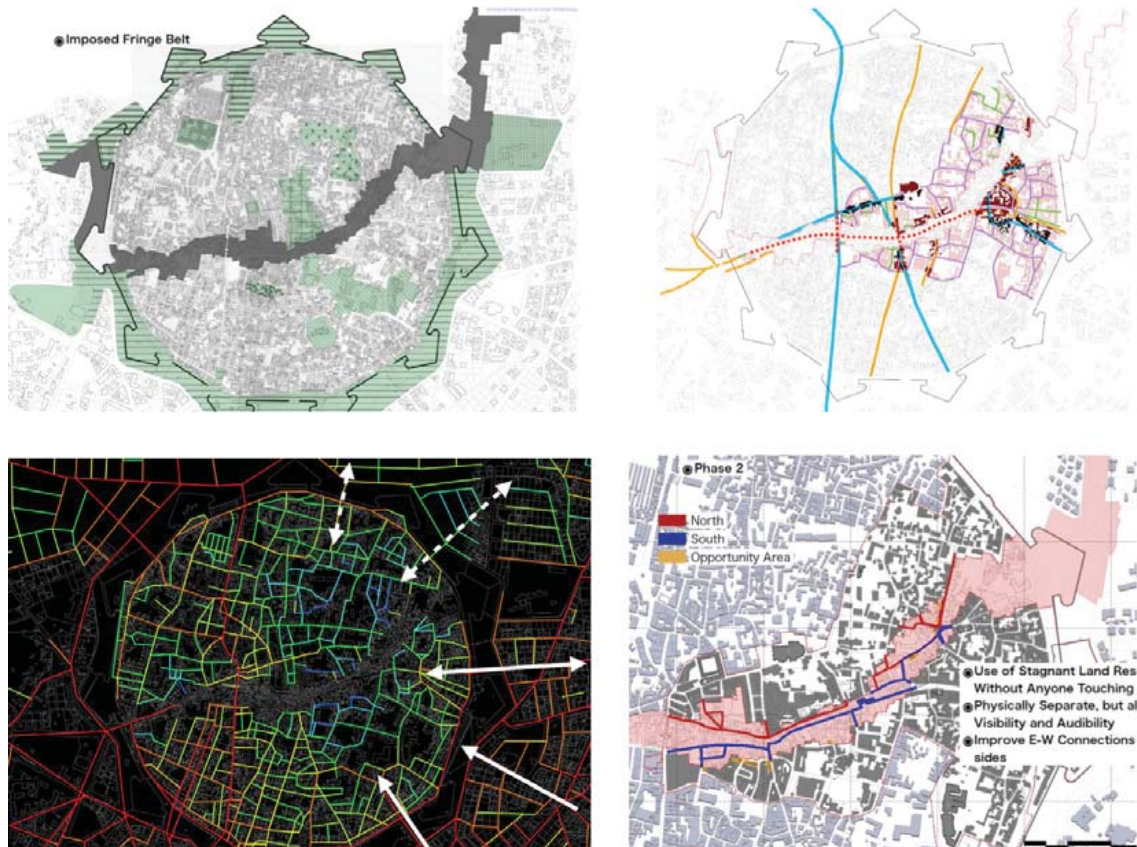
Figure 2. Analysis and design proposal for Nicosia's historic neighbourhood of Ayios Kassianos

Conclusions

The blended learning approach adopted and supported by the digital platform, proved extremely important for the implementation of this project resulting in the creation of a number of Collaborative Learning Activities among partners throughout Europe, facilitating a community of inquiry which is constituted above and beyond institutional and physical barriers. In that sense, it provided the adequate conditions for the implementation of an open dialogue, critical debate, negotiation and agreement between different urban form approaches in the participating institutions. Designing and implementing the learning spaces in collaboration facilitated an open educational practice which helped partners to share through their teaching, freely and openly, ideas, knowledge, tools, approaches and materials used in urban form studies. At the same time, it enabled participating institutions to keep their own academic program, structure and curriculum; in other words, it enabled the participants to work independently and collaboratively. This approach can eventually create and formulate an online community of practice where the active membership of learners and teachers will facilitate an educational social praxis. In that sense, learning

"involves co-construction and co-evolution of knowledge" (Banerjee,2016, p.179) among partners and different schools of thought in the study of urban form.

Acknowledgments

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From past to present.
Shiraz historical texture and its morphological structure

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Abstract

The change in the structure of Iranian cities after the transition from Sassanid to the Islamic era caused new urbanization in Iran that had significant differences with previous urban planning in Iranian urbanism. Iranian architects who used a systematic and geometric structure for designing the city before the arrival of Islam into Iran defined a new morphology for establishing the city. The change made in the Iranian cities was not limited to changing the position of the cities, but also significant changes in the structure and social classes of the cities.

The city of "Shiraz", originally located at the present castle of "Abu Nasr", was different from other cities that built by Sasanian architects. The city of "Darabgerd", "Goor" city, "Bishapur" city, which is a prime example of pre-Islamic Iranian urbanization, has been designed and built on the basis of the Hippodamus system. While post-Islam cities are based on organic systems.

In this research, which is based on studies on the historical context of Shiraz, Iran's urban planning system has been compared with the pre-Islamic urban planning system. Based on the information obtained from this research, it was found that the structure of the city of Shiraz was based on the unit by unit design and with predetermined planning.

This research shows that the change of the city in Iran has been done only in its formal form. And the physical structure of the city continues to follow the structure of the Hippodamus system.

The research method in this study is comparative - analytical. Practical and library methods are used to collect data. The result of this research can help in achieving the principles and design parameters in the historical textures in Iran.

Introduction (Problem Statement)

The shape and existence of the city during its lifetime reflect the spatial distribution of human activities in urban areas and are profoundly affected by management issues and environmental, economic and social characteristics of communities.

The first purpose of examining urban form and structure is to formulate fundamental principles for shaping the future structure of cities. In Iranian cities that have a special morphology due to the use of specific climatic conditions, it is necessary to study the process of changing cities throughout history and to develop guidelines for future city development.

Iranian cities have undergone many changes in recent years due to the arrival of modernity and their morphological structure has changed. The physical structure of Iranian cities began to change rapidly in the 1950s. In the last half century, the transformation of Iranian cities has been accompanied by social and cultural changes. In other words, the change in the structure of cities has changed the social and cultural structure of the inhabitants of cities.

The main purpose of this research is to study the process of the formation and development of Iranian cities and their changes throughout history. The case study for this study and analysis of the physical structure of Iranian cities in the historical context of Shiraz. This study evaluates and categorizes urban shape patterns in Iran and examines the possible relationship of these patterns to a series of human and natural variables. Given a large number of cities, the present study focuses solely on specific urban samples in Iran.

At the end of this research, while examining the type and morphological structure of Shiraz historical texture, it will compare the historical texture and the new urban texture.

Research method

This research, with a general descriptive-analytical approach, collects and reviews library and field data and information. The basic information of this article taken from the thesis of the first author's doctoral thesis at Sapienza University in Rome (Building on Built Space) under the guidance of Prof. Paolo CARLOTTI and Attilio PETRUCCIOLO.

Articles and researches have also been used to formulate theoretical foundations. In order to introduce the study area, statistics and documents in the detailed and comprehensive plan of the city of Shiraz were used, as well as basic information of the Budget and Housing Organization in the population and housing censuses. The geographical area studied in this study is the historical texture and contemporary texture of Shiraz.

After data collection and extraction, the important results were evaluated to investigate the possible relationship of the studied variables with respect to the nature of the data. These results indicate a significant relationship between city shape and human variables such as population size, physical development mode, growth rate, the extent of the urban area, urban population density, as well as environmental and altitude variables with urban shape patterns. Finally, it is attempted to present the results of the analysis in the form of a proposed model for describing urban shape patterns in Iran.

The city and its concepts
Concept of "old city texture" in Iran

Today, the word "texture", more named as "city texture" term, is used in the literature of architecture and urbanization, and it seems to be a completely tangible expression for general and specific people. This word has been originally taken from biology and expresses the living, dynamic and changing nature of the city. The texture of each city, first, specifies the physical aggregation of the city, ie full and empty spaces, their size, and their relationship and their closeness limit. Secondly, reveals the communication networks, the method of access and the general characteristics of ways and alleys; thirdly, it expresses the spatial distribution of activities; and fourthly, it reflects the city formation, development and growth stages throughout history.[1]

And the communications network together compile a combination of filled and empty

[1] Toufighi, M. (1997). Urban development and the logic of escaping from the old textures of Sabzevar city. proceedings of urban textures. Specialty Conference on Urban Texture (p. 25). Kerman: Arg of Bam: Ministry of Housing and Urban Development.

spaces called texture. This texture is dynamic and live. This combination always changes with transformations created in the number and composition of the age of the population, the natural, economic, social and communicational system, tools and technical knowledge, and other factors affecting the formation of urban spaces and elements; and formed to provide facilities and space suitable for life.[2] According to the definition of the Supreme Council for Urbanism and Architecture of Iran, "the context means a linked range that is formed by different morphologies during the life of the city within the boundaries of the city or its margin , in continuity and link with the city". This range can consist of buildings, collections, roads, spaces, urban amenities, and installations, or a combination of them.[3] It is usually possible to recognize the different layers of the city texture by investigating the phases of urban physical-spatial development.

The study of city size concept

City size including the city itself or maybe its previous forms do not have a clear and obvious definition. Various factors affect on the size of a city, the description of which, and the role of each one help to define the city size. Shortly, these factors are:

- Population
- City economic power(the city total income, per capita income or average family income)
- City physical size(city expansion)
- Density(it means the relation between the population and city area, or in other words, the intensity of land use)
- In studies related to the city size, the population factor is mostly used as the demonstrative factor of city size for the reasons given below:
- Access to the information related to the population is easier than other factors.
- As the economic capacity of big and crowded cities in countries with low per capita income is less than that of medium cities in countries with higher per capita income, economic capacity can`t be considered as a suitable criterion for city size because it can`t be used as a general measure.
- Density only shows accumulation rate in a specific location and it doesn't consider the important aspects of development.
- On the other hand, although the physical size of city by itself effects on showing the city greatness , it cannot be an effective factor if not accompanied by other factors, because most of the low- population and wide suburbs, in which there is not much economic activity, cannot find their real situation in hierarchical order of size only because of their area.

Confirming population as the main index in this regard, "Kevin Lynch" says: there is consensus on this issue that key variable is the number of the resident population, not, for example, the number of workers or the geographical extent of settlement or the size of infrastructure or monetary value of production. Also, the United Nations merely rely on population criterion in the classification of the cities size.

Small, Medium and big cities

There is no exact definition for small, medium and big cities. So, the minimum and maximum thresholds are usually considered to determine them. Harvey and Suthertwait have defined small cities like the one with populations ranging from 5 to 20 thousand and middle cities as the one with a population of 20 thousand and more.

At the Seminar on "The Role of Small and Medium Cities in National Development," held at the United Nations Regional Development Center (UNCRD) in Japan in 1982, cities with a population of 20,000 to 100,000 were defined as small and medium-sized cities. So it can be inferred that cities with more than 100,000 people have been considered as the big cities. In the 1970s, Datar defined French cities with a population of between 20,000 and 100,000 people, which is coordinated with the UNCRD definition. Of course, this classification of cities

[2]Sultanzadeh, H. (1995). Naiin of the Historic Millennium. (p. 60) Tehran, Tehran, Iran/Tehran: Office of Cultural Research.
[3]Sharan, Consulting Engineers., Guidance for identifying and intervening in worn-out tissues.2005,(p. 35). Tehran: Fan and Art Idea Publishing.

varies from one country to another.

For example, in China, the cities with a population of 200,000 people or less, those with a population between 500,000 and 200,000 people, and those with more than 500,000 people have been considered as small, medium and big cities, respectively. In Germany, the cities with a population of 20,000 to 100,000 people; in the former Soviet Union, those with a population between 50,000 and 100,000 people; in Africa, those with a population between 20,000 and 50,000 people; and in Asia, those with a population between 20,000 and 250,000 thousand people are called medium towns.

In Iran, the discussion of the medium(middle) cities has first been formally reported in (CE-TIRAN) land use planning reports, and the classification of the population between 25,000 to 250,000 people have been selected for these cities. In the studies on land use planning or designing (Stage I, 1985), the classification of small, medium and big cities have been presented as follows:

- Small cities (with the population less than 50 thousand people)
- Small-medium cities (with the population 50 to 100 thousand people)
- Big medium cities (with the population 100 to 250 thousand people)
- Medium cities (with the population 250 to 500 thousand people)
- Big and very big cities (with a population of 500 thousand to 2 million).[4]

Shape and meanings of the city

The city's shape is a reality independent from the observer, which has been constantly existed and some messages are sent from it. It is in the urban landscape, where the city's shape becomes a direct tangible quality. The power and ability to create a mental image of the city's shape in the minds of a person is a capability in the city's shape. Properties of the city's shape can create a mental image of it and a sense of place in the citizen's mind. The city's shape, which means the mental imagination of the city- including degrees of perception, identification, recognition, and distinction, linking the elements and components, linking and relating the city's shape and activities and linking the events, time and place and relating the non-spatial meanings and values- is the creation of a strong mental image of the city that provides the basis for the interaction of people with the environment.[5]

Factors Effecting on Physical Formation of the City

Throughout history, various ideas have been raised about the roots of the city's formation. For example, from the point of view of Ibn-e Khaldun, the formation of the city has a social root, which has been formed following the luxuriousness and Nervousness of mankind and the necessity of the state existence. From the perspective of Gordon Childe, the formation of the city is rooted in economics, and Amos Rapapourth considers the cultural and psychological context to be effective in urbanization.[6]

Kevin Lynch (1995) focuses on the relationship between the city's shape features and the issues associated with them. Lynch's groundbreaking study of the people mental images from the city they live, created a completely new field of research, called the Cognitive Mapping, and focuses on the mental processes involved in the creation and formation of such images. The importance nowadays added to the concept of "identity of the place" as a reciprocal relationship between the recognition processes of social activity and the shape features.

In Christian Nurburg Schultz's view, human relationship with the environment is more than a person's orientation towards his environment, as Lynch has simply referred to. One can make a person's friendship with a special environment by recognizing the deep process of identification. The identification of man with the place gives rise to the assumption that the

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[4]Zebardast, E. (2003). City Size. Tehran: Urban Development and Architecture Studies and Research Center.42.

[5]Habibi, S. M. (2005). From Shar to City.Historical Analysis of the Concept of City and its Physical Appearance: Thought and Effect (Second Edition ed.). Tehran: Tehran University Press.9.

[6]Nasr, T. (2013a). Components of the Physical Identity of Iranian Cities. In T. Nasr, (Ph.D.) Thesis in Urban Planning (p. 101). Tehran, Tehran, Iran/Tehran: Islamic Azad University, Science and Research Branch.

place has a character- i.e there are features distinguishing one place from other ones and giving places a unique existence or the place' soul-according to which, the main object of the architecture is defined. Any given space or place (including the city) has its own specific text and content and induces a kind of dependency and sense of belonging and commitment among its inhabitants. These three elements, due to the special organization experienced over time, are the important elements of distinguishing that location from other ones, founding the spatial identity; So, the factors affecting the formation of the city's physical body can be considered as economy, community, and nature.

The economy includes the type of livelihood, capital, labor, management, existing politics, and laws and bills, barriers and limitations. The community consists of historical backgrounds of the way of thinking and worldview, population, language, race, religion, traditions, rituals, science, art, technology. Also, nature includes geographical and climatic features, weather, water, soil, wind, plant, sun, and topographic view and landscape.

In 'The Summaries of the Urban Landscape", Gordon Cullen. 1998 presents objective landscape techniques. The analysis of the mental landscape is important for Kevin Lynch, 1960 in "Image of the City". In the paper "Histology and features of the city", Karl Kropf raises the morphology of the city. From his point of view, morphology is a factor in distinguishing a city from another, and the same factor shows the personality and identity of the city.[7]Wagner believes that time and space, human beings, and action create an inseparable identity; therefore, the meaning and the action are intertwined elements, which must be taken into account to understand the identity of the place and time.[8]

Regarding the definition of identity in buildings and cities, Christopher Alexander believes that the identity of each space is shaped by the continual repetition of a particular pattern of events occurring in that place. The identity of any city or building is affected by the event in which it occurs, more than anything else.[9]

Environmental perception

Human perception of the environment is one of the most central issues of environmental psychology. It is a process by which a person chooses the necessary data from his environment according to his needs. Therefore, it is a targeted process and depends on the culture of attitude and value governing the receiver thinking. Hence, the perception process is always associated with the knowledge of man from the environment.[10]

The city's skeleton is a complex of the spine and an interconnected network of utilities and various urban elements, giving cohesion to the totality of city, and its texture is continued throughout the city to its distal components i.e residential districts. This complex illustrates total features and characteristics of the city, including artificial elements (mosques, churches, palaces, walls, and fences) and natural elements(mountains, hills, rivers, seashore and massive vegetation coverings and the like. The city's skeletal elements, which form the city iconic network, are the identifying tools and inflection points in the city, applied to create a   memory of the city and its legibility, through their specific spatial organization.[11]

Rivers, lakes, vegetation and animal species of particular points and other natural factors formed as the main symbol of a city and introduce themselves as the main elements of the city identity, play an important role to recognize the city and its inhabitants. In addition to the natural elements that depict the appearance of a city, the buildings of the network of roads, public spaces, complementary elements of space, such as urban furniture, and in ge-

[7]Karbalayi Nouri, R. (2006). Identity, City, Memory. International Conference on New Towns (p. 373). Tehran: New City Development Corporation Pres

[8]Ghasemi Esfahani, M. (2006). Sense of Place in the New Towns. International Conference on New Towns (p. 325). Tehran: New City Development Corporation Press.

[9]Alexander, C. (2002). The Timeless Way of Building. (Q. B. Mehdi, Trans.) Tehran: University of Shahid Beheshti Press.52.

[10]Nasr, T. (2013a). Components of the Physical Identity of Iranian Cities. In T. Nasr, (Ph.D.) Thesis in Urban Planning (p. 136). Tehran, Tehran, Iran/Tehran: Islamic Azad University, Science and Research Branch.

[11]Hamidi, M. (1997). Structure of Tehran City. Tehran: Tehran Engineering and Technical Consulting Organization Press.87.

neral, the artificial environment, if they are identified, can display a different perspective and landscape of each city's physical body ; The identification of these dimensions should be consistent with the culture and beliefs of the inhabitants of the city. On the other hand, the structure of cities in the estimation of the thinking and worldview of nations and civilizations. The physical image and locations of our city reflect the mental structures of its inhabitants or determine the method of religious beliefs that have long influenced the formation of cities so that Mumford considers the spiritual issues as one of the main causes of the cities formation. It is also imperative to mention that symbols and signs are potential means to explain the meaning. The importance and necessity of the presence of the symbol in the city are so much that Kevin Lynch deems a network of symbols as necessary to create legibility in the city.[12]

The evolution of urbanization in Iran

Although the history of urban development and urban planning in Iran is rooted in the history of the urbanization of this land and dates back to a few thousand BC, there is still a belief that the thinking of urban development and urban planning in Iran is imported thinking. Some reasons, including the following, can be searched for this way of thinking.

Many of the physical effects of ancient urban development in Iran have been eliminated due to the impact of environmental and climatic elements or political and historical adversities, and only very few evidence has remained from them.

among the few urban developments works discovered and the remained, only a very small part, has been scrutinized and introduced scattered. In contemporary urban development, no much evidence is observed about the thinking performance of ancient and enlightened Iranian urban development. The contemporary pluralist urban development has turned the urban environment into a handful of land usage and disproportionate construction styles, and completely deprived it of the unity existed in the regular environment of the predecessors, which has been praised.[13] Modernity, with the concept of rationalism and the destruction of traditional beliefs and habits, along with passing the financial and intellectual methods, has also transformed the ancient architectural and urban development life.[14]

Ancient period and its empires

The ancient period began about in 19th century B.C. and continued until the 7th century A.D. According to evidence and resources available, the process of urbanization and urban development in this period can be studied in five historical sections, which coincides with the emergence of governmental systems. The of Medians empire was accompanied by the beginning of Iran civilization, lasted from the 9th to 7th century B.C. The Achaemenid empire covered the 7th to 4th century B.C., and in the 3rd century AD replaced with Seleucids.

The 3rd century B.C. to 3rd century A.D. corresponds to the period of the Parthian sovereignty. From then on, until the 7th century A.D., began with the Islamic Muslim invasion to Iranian urban development, the Sassanians came to power in ancient history. Generally, the spatial construction of Iranian ancient city consists of two distinct parts: one was the state citadel, and the other was the "SHAR" or the main city, which formed the basis of the spatial divisions of the city.[15]

This traditional allocation and division of space were formed during the Achaemenid empire and gradually evolved into a structured form in the Sassanid empire. The governmental citadel, later called "Kohndzh" or "Qahandeh" by Muslims, was a strong citadel or castle with political and governmental functions, from where, the organized urban management of the city was applied to the city's social and economic constitution; That is why it has been

[12]Lynch, K. (1960). The Image of the City. Massachusetts: Mass Cambridge Massachusetts: MIT Press.
[13]Turner, T. (2000). City as Perspective. (N. Farshad, Trans.) Tehran: Urban Planning, and Processing Co.19-20.
[14]Ahmadi, B. (1994). Modernity and Economic Thought (First Edition ed.). Tehran: Markaz Press.11.
[15]Habibi, S. M. (2005). From Shar to City.Historical Analysis of the Concept of City and its Physical Appearance: Thought and Effect (Second Edition ed.). Tehran: Tehran University Press.30-36.

the residence of his ruler, his family, and his relatives and his guardian and security forces.

The Shah's palace, the relative's domicile, the treasury barn, courts, military installations, and soldiers houses, temples and main fire temples, and defensive fortifications constitute the complex of the physical body of elements of this section. Due to the key role and strategic importance of governmental citadel in the city, it was located in a high place in the center of the city in order to provide a reliable and effective defense against internal and external enemies. In the mo rphology of the ancient cities of Iran, "SHAR" (or the main city), is part of the city's physical body, inhabited by its citizens. Zoning or urban districts form the basis of its physical divisions. The physical foundation of this section, called the "Shaarestan" in the Islamic period, can be defined with a set of houses, temples and fireplaces, the main Bazar and defensive fortification. Occasionally, the "SHAR" itself was organized and arranged with other sub-divisions, the middle "SHAR" and outer "SHAR" (Rabaz in the Islamic period), which reflects the class system and aristocracy ruling the city.

Another segregation observed in the urban development of this period is functional segregation, or in other words, the traditional separation of urban use. The ancient city of Iran has had a set of defensive - military, governmental, commercial, productive (workshop and agricultural), religious and residential. The physical elements and spaces occupying this function (ie, the governmental citadel, the Bazar, temples, houses, farms, workshops, and defensive fortifications) have been clearly separated and each one has been located in a certain place in the city.

In fact, the location and distribution of urban uses throughout the city have been done according to their performance criteria, which is considered as one of the most important principles of urban planning. Based on this criterion, the interference and adjacency of heterogeneous used have been avoided in the organization of urban uses. This is still considered as the main approach and has an important place in urban planning, whether in modern urban development and town development or in old urban planning.

Spatial organization (spatial determination of principles and concepts)

The study of the spatial foundation and urban morphology of the ancient Persia shows significant evidence of the performance of urban planning rules and criteria of this period. These rules have crystallized in various ways on the cities' body and reflected their effects on urban space organization.

Unfortunately, such spatial effects, either due to climate effects, political or historical adversities, have not been retained or properly studied, so that today it can be used accurately with all dimensions to determine and depict the delicacies and details of Iranian urban development. However, the amount that has been remained and studied can be effective to discover and understand many facts and highlights the great points of traditional urban development of Iran.

The study of the remaining texts and the remnants of ancient Persia cities, with all of its shortcomings and deficiencies, reflects the fact that the criteria and thoughts of urban planning have been crystallized in various dimensions and appeared physically in the body of the city. These thoughts first appeared in the construction of single monuments and urban elements (such as the temple), then they were continued with the construction of urban collections, and finally, have been occurred in space with the emergence of complete urban samples. Thus, they have been turned from the soul to the physical body in various dimensions and have been visualized spatially.

Accordingly, urban development and urbanization in Iran refer to three great historical experiences and periods; the spatial crystallization of the city in each of these periods, in addition to the historical continuity of the concepts of the previous periods, has both its evolved form and the new concepts, which is unique to the same period. These periods include:

First period

This is the birth and emergence period of urbanization and urban development from the 9th to 4th century BC. This section has been lasted six centuries and covers the governance period of the Medes and Achaemenid dynasties. In this period, the city, urbanization and

urban development were founded under the influence of cultural exchanges and social interactions with urban civilizations located in Mesopotamian Plain, in Median land and organized in Achaemenid land.

The urban planning thinking of the Median period, which is significantly visible in the "Hegmataneh" (Ecbatana)construction, is defensive-military thinking that reveals its effects in locating the city and its physical face. The emergence of military and castle cities, which have a special place in the typology of Iranian cities, has been the direct consequence of this thinking. The city, in the first place, was a tough and strong castle over a hill or strategic point, and its development was heavily influenced by defensive and military strategy.

For this reason, in the urbanization of the Median period, an element that played a key role and was carefully designed and planned, was a governmental citadel, i.e city's defensive castle and fortifications, and its internal divisions. Other urban elements such as the Bazar, urban districts, and "SHARESTAN" in the spatial organization of the city did not have a prominent position and evolved shape, and were in fact in their early stages.

When this urban development thinking comes to its Achaemenid period in its historical movement, is transformed according to time requirements , creating another organization in space: the Military - castle city of "Media" is replaced with Persian military- commercial and commercial-agricultural city (Achaemenid); Urban development is liberated from the monopoly of military- defensive thinking and organizes urban and regional space in accordance with Achaemenid urban development thinking. The first phase of this program, on a macro scale, follows the division of land and empire territory into the country, clan, village, and home. In addition, some programs are being implemented at the local level for urban organizing. Within the frame of these programs, the city is the main site of which, in addition to the divisions that classify the social body of the city, some divisions are also applied to the spatial organization of the city, which finds a definite form in its body.

The spatial division and allocation of the city's physical body to three branches of the governmental citadel, the medial "SHAR" and the outer "SHAR", which is the basis of the spatial divisions of the city throughout the ancient period, is first apparent in the spatial organization of the Achaemenid city. Since then, the Bazar element finds a definite place in the physical body of the city and its function plays a significant role in the city's economic life. The mechanism of genesis, transformation, and evolution of the city and urban development in Median and Achaemenids periods, known as Persian style or Persian method in urban development, ends with the "Alexander the Great" attack in the third century BC; and the middle period in ancient urban development starts.

Second period

This is the period of combining and integrating both Iranian and Greek urban development, and foundation of autocracy cities with the style of government-Greek cities on the Iran national statue. This stage began with the invasion of Alexander the Great in the 3rd century BC and coincides with the short period of the Seleucids sovereignty in Iran. In this period, the urban development politics of the Medes and Achaemenids, i.e Persian style in urban development, which was derived from Mesopotamia, became native in Median land and evolved in the Achaemenid government, was invaded by the Greek urban development method and, to some extent, lost its unity and integrity. For this reason, the physical-spatial formation of the city has undergone the change and exhibited other symbols. One of the urban development activities of the Seleucids was the construction of the new-founded cities and towns and in the Greek urban development style, using the Hippodarius chess grid, which was often commercial and strategic routes.[16] Another measurement of Seleucid urban development is the reconstruction of many urban centers and ancient villages- cities of Iran using the Greek urban development method. In most cases, Alexander and his successors (Seleucid), repaired and rebuilt old cities and ancient residential centers, and changed them accordingly to their desires. In this regard, fertile areas such as Kermanshah, Borujerd, and Hamedan were considered by them, some changes were made in cities and centers

[16]Taghavi Nezhad Dilami, M. R. (2002). Architecture, Urban Development and urbanization of During the time passing. Tehran: Yasawoli press.80.

such as "Kangavar", "Nahavand", and "Dinor", and the Greek installation was made; "Heg-mataneh" was rebuilt.[17]

And Susa and Fasa cities have undergone some changes. One of the most important elements in installed in these cities, following the Greek urbanization, was the element of the field as a social and public space that has been added to the elements of the physical organization of the cities. In Seleucid period, which lasted less than a century, the city and urban development generally continued to grow, but experienced the transition period from an indigenous and Iranian style to a mixed way called "Parsi-Helleny", and revealed its evidences in the spatial organization and the physical formation of the city's physical body in different parts of the country.

The third period

It is the flourishing period of urbanization and urban development, and generalization of its expansion throughout the land. This period, which lasted from the 3rd century BC to the 7th century AD, coinciding with the period of the Parthian and Sassanid sovereignty in Iran, is considered as the last stage in the history of urbanization and urban development of ancient Iran. This period was accompanied by the emergence of a Parthian style in urban development and ended with a Muslim invasion in the first century AH.

The city became the key element to organize the national space during this period.

Until that time, city and urban development were b being manifested in the concept of single cities in space, which often was capital centers and a symbol of the saber-rattling of the ruling dynasties; whereas urbanization and urban development were shaped on a massive scale in space after that .i.e a network of cities that had diverse functions and used them in the urban area. Urban thinking and urban planning criteria of the ancient period in its historical dynamism, reaching this stage, obtains the peak of its evolution and defines and establishes the true identity of the ancient city of Iran, as we know today. In the division of the country for its more administration, Parthians paid more attention to the cities, and principally, provided a kind of internal autonomy to the states and the cities.[18]They are the founder of a type of city that is called circular or around cities in urban morphology. These centers were often found in cities with a circular design whose design and construction were heavily influenced by defensive criteria. This reveals the insecurity of Iran in the Parthian period. Some historical sources regard this urban form as an adaptation of the principles of West Asian's old urban development or derived from the design of the military camps of Assyria.[19]The development of the castle making art and the construction of defensive fortifications in the architecture and urban development of the Parthian period can be analyzed in conjunction with this urban development method. In the Sassanid era, a vast network of new-founded towns, known as Shah's cities, was built with the principles of Sassanid urban development by kings, especially powerful kings like Ardeshir, Shapur, and Ghobad. The scope of Sassanid urban development activity was such that today it has created the belief that most of the ancient cities were formed during the Sassanid era or the ancient cities of the past periods that expanded and prospered in this period. Ten city constructions have been named in the list available from state capitals in the Sassanid era.[20]The construction of port cities in the ancient period should also be attributed to the Sasanid era. They established a number of port cities, including Rishahar and Siraf, on the northern coasts of the Persian Gulf, to develop maritime commerce. The main factor for urban development and urbanization in the Sassanid era is the link between the national economy and the urban economy. Cities have been the main focus of trade exchanges; therefore, the government administration has been highly dependent on urban economics.

In the last period of the history of ancient urbanization and urban development (Parthian

[17]Taghavi Nezhad Dilami, M. R. (2002). Architecture, Urban Development and urbanization of During the time passing. Tehran: Yasawoli press.79.
[18]Nehchiri, A. H. (2000). Historical Geography of Cities. Tehran: Madreseh Press.290.
[19]Girshman, R. (1993). Iran from the beginning to Islam (10 ed.). (M. Mohammad, Trans.) Tehran: scientific and cultural.326.
[20]Ashraf, A. (1974). Historical Features of Urbanization in Iranian- Islamic Period. Social Sciences Letter, 1(44),32.

and Sassanid), urban development criteria and urban planning regulations are being used to organize urban spaces and reach the peak of their evolution. The spatial structure of the city's physical body can be defined and described as a manifestation of these criteria, with the following characteristics:

1) Urban space is separated in its entirety by some segregation. The result of this separation is the allocation and division of the physical body of the city into three parts of the governmental citadel, the middle town, and outdoor city.

2) Among the triple spaces of the city, whether in the "Parthian" city or in Sassanid city, the governmental citadel is considered as the most prominent urban space.

The style of urban development commonly used by the Parthians and the Sassanid are known as the "Parthi" method or style of urban development in the ancient period of Iran. It seems that in this urbanization, building with consciousness, and establishing with previous design and plan,i.e the planned urbanization, has been of a prominent place in the complex of urban activities. This is confirmed by similarities between the design of the Sassanid. The results of archaeological reviewing and historical studies describe these maps in the form of a rectangle. The intersection of the main axes in its internal networking has imagined the cross shape.[21]ARG-e-BAM(BamCitadel) is one of the cities that built based on this system.

Conclusions from previous discussions

The results of these studies indicate that the traditional Iranian urban development system has been   based on a set of old, but unwritten criteria and regulations. These regulations are a combination of economic, environmental and worldview features or a perspective of the existence that has been faced to man. Accordingly, some factors such as water, defense, the functional unity, performances and the types of spatial, functional and classical segregations have been considered in urban development. Works that have remained from the spatial-physical body of the Iranian city from Median to Sassanid, with all their inadequacies and limitations, show well the performance of mentioned thoughts and their transformation from soul to body.

Tracking these planning thoughts and the spatial organization arisen out of which, while emphasizing the endogeneity of urban development thinking in Iran, can be regarded as a valuable resource for reviving past values in contemporary urban development. The essence and motive of many of these thoughts, as persistent principles, illustrate the continued ability of the traditional, alive and dynamic principles that can be used in different conditions and situations.

There is no doubt that life is evolutionary and developmental; and dynamism, growth, and variability are undeniable properties of existence, and urban development is not excepted from them. But the semen of this dynamics is undoubtedly in the past. It is born from the past and is the result of the message of the past, and of course, have preludes for the future. One of the points that have been observed in Iranian urban development, even until the end of the last century, was the continuity and historical sustainability of traditional principles and concepts;

However, the aspects of innovation and adaptation to time are also considered. But today, what is in front of the Iran urban development, because of the disconnection from historical past, evokes nothing except the maid, separation, and irregularities. The issue of the society modernism moreover, has targeted the transformation of the urban community, in the physical dimensions of the city, more than anything else, and greatly altered the ancient concepts of urbanization.

Reading the urban morphology – of Islamic cities - in Iran and city formation based on morphology
Urban morphology

Traditionally, urban morphology is defined as a systematic study of the form, shape, and design of urban areas. Also, the growth and function of the city would be added to this definition in some cases. Generally, the cities function plays an important role in urban morpho-

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[21]Mashhadizade Dehaghani, N. (1994). Analysis of Urban Planning Features in Iran. Tehran: University of Science and Technology of Iran.217.

logy formation, so that each urban function creates a special morphology and landscape.

For example, the cities with multiple textile factories, typically provide a special form of urban morphology along with spinning factories, their own warehouses, and labor house; whereas, pilgrimage cities with minarets, finials, mosques, churches and religious schools create another kind of morphology. Urban morphology can be studied in three periods, in terms of time.

Historical genesis period: The geographical situation and historical backgrounds give birth to the city in this period. The city is gradually developed under the influence of various internal and external factors. The heart or the center of the city has administrative and religious attractions.

Patterning and formation period: The built streets and paths create the skeleton of the city, and it takes a special patterning by its different cores and their functions in this period.

And, the configuration period:

The morphological features of the city clearly illustrate the relation between its morphology and function in this period. This period is influenced by gravity and centrifugal forces.

By studying the structure of cities, it can be found that urban morphology emphasizes on several basic issues;

- Urban design analysis in the morphology of cities:

The city physical and topographic development , the streets system, properties of the buildings, the city development project in historical periods, Bazar places (its genesis and evolution) of urban cells, changes in the central part of cities, construction of land use and the effects of gravity and centrifugal forces will be studied in this method.

- Periodic behavior: different land-use periods, building forms and the correlation between the development of urban areas form and marginal belt with economic fluctuations and social class location will be emphasized in this kind of survey.

- Factors affecting on morphological changes of the city: In this regard, the study of the change in the form of buildings given the personal and public buildings, change of social and economic factors, analysis of landowners', planners' and architects' role in urban morphology, suburbs and new cities as well as interdependence between form and function are considered as the important issues to recognize urban morphology.

In addition to three mentioned factors, the climatic and topographic conditions, as well as ideological values, also play an important role to form urban morphology.

Islamic city

A full definition of the Islamic city and its properties has not been provided yet. But according to Naghizadeh point of view, the Islamic city is an evolving process, and always adapts itself to requirements of its time, place and inhabitants, of course with reference to Islamic principles. In other words, the Islamic city is a potential identity, which can have its own special interpretation and manifestation at any time and place, with due regard to technology, materials, knowledge, arts and native culture.

Parviz Piran believes that "such a general naming – i.e. the Islamic city - of the settlements in the Islam world is wrong. In this regard, he writes: "Such a naming, more by Western scholars, is mixed with some prejudices and incompatibilities, and adds a concept to confusion rather than enlightenment. Ultimately this application may be simultaneous with other misunderstandings and it would be supposed that the mentioned cities have been governed according to Islamic laws. Although some features of Islamic world cities, such as mosque, Azan, and to some extent the Bazar, are almost the same; and although in the large part of ancient world, the concept of the district has been similar in many cities, a diversity that exists in the cities of the Islamic world, in any respect, is so dramatic that it's difficult to classify them in a group because of some similarities".[22] In Mahmoud Tavassoli's point of view, the Wests' reason for such terminology is "location of the city (ies) alone in one Islamic city and its formation after the genesis of Islam."

He poses the fundamental question that: "First, what should we do by the cities, whose core dates back to the pre-Islamic era And secondly, can we consider any city as Islamic,

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[22]Piran, P. (2007). the Village Theory replaced by the City Theory. Andishe-ye- Iranshahr, 1, 75.

albeit it has been formed in an Islamic country and in the Islamic era".

In this regard, he brings the opinion of two orientalists, accompanied by him in some way, and writes: Claude Cohen and Jan Oben believe that it is better to say that cities in "Dar al-Islam" than Islamic cities. Cohen shows that most of the features considered for Islamic city are in fact particular to cities of the Byzantine and Middle Ages and the Italian cities before the 11th century, and even to some extent, China and Central Asia".[23]

Tavassoli emphasizes again on his opinion and writes: "although it is difficult to identify the pre-Islamic core due to extensive changes made in Iranian cities structure during the Islamic period, there is no doubt that many physical features of the architecture and urban development of the ancient Iran era have come to the Islamic era".[24] In this regard, Ahmad Ashraf writes: Iranian cities in the Islamic era were formed from a mixture of Sassanid city with the new-founded Islamic cities.[25] Javier Doplanol believes that the Islamic city is a combination of intertwined blocks, ventilated undesirably through zigzag alleys, dark courtyards, and low-rise houses, endlessly segmented due to their small courtyards; and it seems that disorder is the most prominent feature of Islamic cities.[26]

Properties of Islamic city in Iran

Islam is the dominant factor of Islamic city pattern, based on which, all indicators and elements of the city social and physical life are identified and systemized certainly.[27] Kohandezh and the governons seat (Dar-ol-Hokoomeh), Bazar, mosques, schools, and districts are all visual representation of the system of governance, guilds, religious communities and nation (Ummah) in Islamic city.

Urban renovation is being continued as one element of the city dynamics. The people themselves embark to do so according to requirement, and all of the custodians and managers of the city move towards this dynamics.[28] In general, despite the various differences between traditional Muslim cities, two factors including urban construction and the city texture can be considered as commonalities of spatial-physical properties of Islamic cities, which include the inner and outer complexity. The mosque was added to Islamic cities structure as a new element. According to historical documents, the first Islamic state was built in the mosque.[29]

Islamic cities morphology

Perhaps, the traditional Islamic city would be the manifestation of a meander in twisted alleys at first glance.

In the top view of the city displays itself in a crystalline form, with cubes and charters-which are in fact the community of side- by- side houses, the cut spaces, everyday life commute, convoluted paths and the tied roads that seem to end nowhere.[30] According to Moghaddasi, the streets of Shiraz were so contracted that even human or animals could not cross it.[31]

[23]Tavassoli, M. (1990). City in Islamic Era lands (First Edition ed.). (A. Iraj, & M. Yahya, Eds.) Tehran: Asatir press.359.

[24]Tavassoli, M., & Bonyadi, N. (2010). Urban Space Design. Tehran, Tehran, Iran/Tehran: Shahidi press.127.

[25]Ashraf, A. (1974). Historical Features of Urbanization in Iranian- Islamic Period. Social Sciences Letter, 1(44), 20.

[26]Hakim, B. S. (2002). Arabic-Islamic Cities: Principles of Urban Development and Construction. (M. A. Mohammad Hossein, & A. M. Aref, Trans.) Tehran, Tehran, Iran/Tehran: Ministry of Culture and Islamic Guidance.364.

[27]Ayazi, S. A. (2008). Explanation of Islamic Thought around the City and Urbanization with an Emphasis on Religious Texts. The first Conferences of Islamic Utopia (p. 102). Isfahan: Isfahan University.

[28]Habibi, S. M. (2005). From Shar to City.Historical Analysis of the Concept of City and its Physical Appearance: Thought and Effect (Second Edition ed.). Tehran: Tehran University Press.141.

[29]Ben-Hamouche, M. (2009). The complexity of Urban Fabric in Traditional Muslim Cities: Importing old Wisdom to Present Cities. Urban Design International, 14, 23.

[30]Bmat, N. a.-D. (1990). Islamic city. (M. H. Halimi, & M. Eslambolchi, Trans.) Tehran, Tehran, Iran/Tehran: Printing & Publishing Organization of the Ministry of Culture.87.

[31]Moghaddasi, A. A. (1982). Ahsan al-taqāsīm fī marifat al-aqālīm (Vol. 2). (A. N. Monzavi, Trans.) Tehran, Tehran, Iran/Tehran: Corporation of Authors and Translators.640.

In the old texture of Tehran, the paths were narrow and twisted; and the buildings had protrusions to path space to create more shadows. The orientation of houses and, consequently, the street plans had partly environmental logic. The streets and alleys were continued to the front of the entrance door but did not give any picture of the nature or dimensions of the district.[32] The fact is that villages, towns, and Islamic cities were rarely matched with the geometric symmetry of urban design. In order to create distinct areas of the public space and the traffic system, the structure of the Islamic city is limited to the spaces between houses and spaces such as shops and chambers. While the social composition of the Iranian city is matched up with Islamic needs, its› morphology is to a large extent the logical response of culture to the natural environment, especially the topography and climate of the Iran plateau. The climatic conditions of Iran Plateau and other Middle East countries have caused the central yard system to be considered as the dominant model, for most Islamic cities of the mentioned region, to achieve the proper dwelling conditions.[33] The emphasis on observing the sanctity of family was one of the most significant factors leading the internalization principle of residential districts. Observing this principle in buildings was influenced by various factors including climate, geography, and security. This was approved and encouraged due to compliance with the principle of family sanctity in Islam, and the application of this principle in all urban and architectural spaces has been effective in the emergence of compacted and continuous urban textures in historical textures.[34] The grand mosque and religious centers are considered as centers accumulating the urban textures in Islamic cities. In the district centers, some elements such as anchor, mosque, seminary school, bathrooms, and shops configure the urban texture. Usually, the fields in Islamic cities are spaces enclosed with surrounding buildings, creating a space for social, cultural, religious and sometimes commercial activities. These squares exist in the textures of Iranian cities both in geometric and non-geometric patterns.[35]

In a general statement, we can mention the following items about morphological-spatial properties of urban texture in Iran:

- In Iranian cities, each element of the architectural physical body has a specific function and an amazing relation with other elements of architecture in unifying hierarchy. Houses are balanced and proportionate in terms of the height, volume, composition, materials and outside decorations.

- In Iran cities, the communication has taken a more legible form based on more clear relation between the city center and district through main paths as linking elements. This feature is evident not only in the entire construction of the city but also in its components, i.e. the district centers.

- In the old cities of Iran, the residential units are joined with the central courtyard. The physical organization of the old cities of Iran is based on the spatial link between the elements including the city center, the district centers, main crossings, and square.

- The coordination of the scale of the main crossings and paths of the city with secondary sidewalks is another feature of urban texture in Iran.

- Breaking the linear state of the local streets, adjusted with breaking the uniform voids into a few contracted and wide spaces, dynamically and steadily, through a combination of different but harmonious bodies, is another feature of Iran urban textures. In fact, this is the reduction of length and creation of a variety of space, distinguishing it visually.

- In urban spaces of Iran, in spite of the variety of geometries and volumes applied in urban spaces structure, a balanced and adjusted combination of contradictory functions has been created with high proportionality, supporting the urban services through a logical relation with each other.

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[32]Shokoee, H. (1988). New Perspectives in Urban Geography. Tehran, Tehran, Iran/Tehran: The Organization for Researching and Composing University Textbooks in the Humanities (SAMT).191.

[33]Kheirabadi, M. (1997). Cities of Iran. (H. Hataminezhad, & E. Mafi, Trans.) Mashhad, Mashhad, Iran/Mashhad: Nika press.21.

[34]Kheirabadi, M. (1997). Cities of Iran. (H. Hataminezhad, & E. Mafi, Trans.) Mashhad, Mashhad, Iran/Mashhad: Nika press.41.

[35]Tavassoli, M. (1988). Principles and Methods of Urban Planning and Residential Areas in Iran. Tehran, Tehran, Iran/Tehran: Research Center of Urban Planning and Architecture of Iran.137.

- In the urban texture of Iran- between the buildings combined to create an enclosed space in the city- there is such a harmony in morphological unity that, the mentioned space becomes continuous and creates a harmonious unit, despite the formation of enclosed spaces from different buildings.

Shiraz and its formation in the context of urban morphology

The Iranian cities have had different shapes and designs in the vicissitudinous historical context of Iran plateau and its vast empire territory. However, they all have a single design in terms of hierarchical structure. Iranian cities with special and prominent historical core such as Shiraz, Esfahan, Kashan, Yazd, Tabriz and Mashhad, all follow an organic structure and have formed the city based on climatic, cultural, social, military and sometimes political parameters. During the Achaemenid era, Iranian cities were built under the influence of the Assyria urban development, with an emphasis on the defensive aspect, with circular plans, the most important of which can be mentioned as Darabgard and Shahr-e-Goor cities. Cities that have been formed over elevations, hills, and mountains according to their time requirements-based on the military impacts and defensive implications of the city- have also been another type of Iranian urban development typology i.e the morphology of Iranian cities. Such cities have not been built with a single typology. But the city defensive part was built on adjacent elevations, and other parts were formed on the submontane plains.

At a certain section of Iran the history (the Parthians or Arascian), the city was designed and built with the pattern of the Greek cities design, leading to the formation of the Hippodamus cities. This type of urban morphology has long been prevalence in Iran urban development and formed the foundation of Iranian cities in ancient times with a slight shift and getting out of geometric constraints. Bishapur can be mentioned as one of the cities with the Hippodamus design. The city of Abu Nasr, which is the site of the formation of the primary core of Shiraz, was also formed in the morphology of Iranian cities.

Abu Nasr city, where the primary core of Shiraz was formed, was also formed following the Iranian cities morphology.

The genesis of Shiraz City

Before entering the Aryan race, the ancient inhabitants of Persia have been consisted of relatively rude black local natives living in the mountains, the evidence and symptoms of them are now available in ancient Iranian museums, Persepolis and Pars.

According to the researchers' view, the Aryans have arrived at the Iran plateau from 1000 to 1400 BC.

As Herodotus says, the Aryans (Persians) have consisted of 10 tribes, one of which was the Pasargadians who settled in Pasargad city and then Istakhr city. It is not certainly clear that which tribe of Persians has settled first in the Shiraz plain. However, we know that the Pasargad city has started to be destroyed, after the domination of Alexander, and its people have moved to Istakhr city and transferred from the Istakhr to Shiraz after the Arabs dominated.

In general, no much information is available about Shiraz before Islam, since most of the available historical books related to Shiraz are from the works of Islamic historians, who have generally focused on post-Islamic events and situations, and have paid less attention to pre-Islamic history.

These books, which may be the only means of accessing the position and limits of Shiraz in the past, attribute the shiraz construction history to Muhammad ibn Yusuf al-Thaqafi, the governor of Fars during the caliphate of Abd al-Malik ibn Marwan(65-89 AH) 685-708 AD. And some of these books restrict this date to 76 AH or 696 AD.In his Farsnameh book, Ibn Balkhi expresses the Abu Nasr city or collection, now known as Qasr-i Abu Nasr as the origin of Shiraz. If we imagine Qasr-i Abu Nasr as the origin and source of Shiraz, based on the available evidence, we choose a rational Eastern source; and If Ibn Balkhi's text is correct, we can consider the distance of six kilometers between Qasr-i Abu Nasr and the old location of current Shiraz as the movement route of Shiraz from the original to current situation.

According to the foundation of Shiraz and changes in the city development from the beginning of Islam on, that is visible in the available maps, Shiraz has always been moved toward the west, and this is true also about the present era and the development direction

is quite evident.[36]

Therefore, Shiraz can be considered a city, developing from the east to the west, and the current situation of the city development can be considered as confirmation of this theory. One of the main causes of this mobility should be sought in a natural situation and atmospheric conditions of the plain, so that investigation of the natural situation of this area shows that the rainfall in the northwest highlands of this plain is high and always waters flow from west to east toward the Maharlou lake. After the Arabs conquest to Iran and breaking down of Istakhr city, the city was gradually evacuated and its inhabitants turned to Shiraz. According to the contents of the Islamic histories, which is considered as the only evidence of Shiraz historical development in the Islamic era, Shiraz was founded in 74 AH or 694 AD, by Muhammad ibn Yusuf al-Thaqafi, the brother of Hajjaj ibn Yusuf, appointed as Shiraz governor by Umayyad caliph and Abd al-Malik ibn Marwan. The primary core of the city was at the time of foundation without any defensive battlement. However, some battlements with a ditch full of water were built around it at different times. The first battlement of Shiraz was built in 639 AH or 1242 AD. The Shiraz Fence was renovated or reconstructed several times during different years. It was destroyed by the earthquake in 1339 AH or 1921 AD, and no fence or battlement has been renovated from then on.

Flourishing and development of Shiraz are merely limited to times that it has been capital or has become important for some reasons.

The study of the historical evolutions of the city shows that the origin of Shiraz city formation should be searched in the Bazar and four axes that have crossed them and surrounded the urban elements. Each axis represents a physical evolution of a period of city history. These evolutions have taken place in accordance with the requirements of the time and with respect to past experiences to improve and complete the city structure. The placement of urban elements during these axes has been subject to a certain arrangement so that the common features of the city structure at different times are as follows:

- The location of urban elements at the route of the infiltration galleries and the flowing waters;
- The segregation between the religious, governmental and commercial field of functions;
- Existence of interface spaces and functional joints.
- The first urban space was created for the gathering of Muslims, following the construction of the Aqiq Grand Mosque during the time of Amr-i Laith Saffari. After that, some places such as the New Mosque, the Shah Safavid Square, Toopkhaneh Square and so on created the past urban spaces, so that Shiraz has never been empty of urban spaces until the contemporary era.

Briefly, The steps of Shiraz city formation are as follows:

-1st step:

The first step of the city's main structure formation relates to its flourishing at the time of Al Boyah, in the 4th century AH or the 10th century AD. Before that, the Atiq Grand Mosque was constructed and the city Bazar was continued from its side to the Istakhr city gate. Urban elements were established on the way to the Azodi Qanat at the time of Al Boyah.

The governmental buildings were located in the west and religious elements were centered on the east of the Bazar axis. This pattern has also led to the formation and expansion of the main city skeleton in later periods.

-2nd step:

The second step of the city historical evolution of the has been during the Fars Atabakan era. The segregation of urban functions was also observed in another axis, which was selected during this era parallel with the Azodi Qanat. In this era, some frontage-shaped spaces were created between these spatial elements, which facilitated their activities.

-3rd step:

The third step of the city historical evolution dates back to the Safavid period. In addition to the main structural elements of the past, the Safavids had a specific pattern and method to design urban spaces, which adapted it to the needs of the city in different conditions.

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[36] Quotes from the report of Cultural, H. O. (1995). examining how Shiraz was formed and the process of its transformation in different periods of history. Shiraz: Fars Province Cultural Heritage Organization.1-2.

The third axis of urban elements placement in Shiraz, which has been created in this period, started from the Khan school in the east to the Daoud Khan Bazar in the middle of the two direction of the Bazar, reaching the Shah Safavi Square, surrounded with the palace, Dar al- Shifa and the Safavi Mosque.

At this time, another axis was constructed in the form of Chahar Bagh, extending from the Darvaze Isfahan to the Tange-ye Allah Akbar.

Due to the destructive floods in 1079 AH. 1669 AD in Shiraz, the Afghan invasion and destruction of the buildings by the next dynasties, the valuable treasure of Safavid architecture and urban development in Shiraz was demolished, and there was nothing left but a few buildings, and references to some of the historical documents.

In this period, which is considered as the most flourishing period of urbanization in Iran after Islam, Shiraz had such an extended area during the Safavid era that, the city was not expanded as much from then on, until the early Qajar era.

-4th step:

The fourth step of the city historical evolution is during the Zandieh period. After defeating the Afghan attack, Karim Khan Zand arranged Shiras as headquarter of his government, then built and developed the city since 1180 AH, 1767 AD.

He built his of governmental buildings often on the axis leading to the Bāgh-e Shāh instead of the Safavid destroyed buildings and gardens.

Although the architecture of Zandieh buildings enjoyed the sophistication and hardness of the Iranian architecture culture, in the urban design of this period, the functional aspects were considered as important more than the values of aesthetics.

Considering the distribution and compression of urban elements in a set of Zandieh axis buildings confirmed that, designing has been done in a predetermined range and within a damaged urban texture.

Shiraz historical texture analysis based on the angle of formation of building units. In this chart the historical context of shiraz is analysed by AutoCAD software. This analysis is based on the dominant angles in the historical context. The color RED,BLUE and GREEN indicate the abundance of building units based on their angle.

Urban Texture in Shiraz City

According to investigations, the current Shiraz City has the following textures: old texture, middle texture, new texture, peripheral texture, cellular texture, and semi-rural texture.

A) The old texture

formation of this texture dates back to 1300 SH. Residential units and the remaining structure in this area were formed mainly in the thirteenth century. The old texture of Shiraz is referred to as the area located on the sides of the Zeinabiyeh, Sibouyeh, Qaani, Saadi, Ferdowsi, and Keshavarz and has been situated almost within the area of the last battlement of the city. In the past, this area has been limited to a battlement with six gates, encompassing some districts. The central parts of this texture are much older. This texture is divided into northern and southern parts by streets called Karim Khan Zand and Lotf Ali Khan Zand. Except for two mentioned broad streets, several other subways have contributed to disintegrate the city ancient texture. Changes in the composition of different elements and forms of communication networks of the cavalry, infantry, the city Bazar and valuable monuments adjacent to them, not only provide the original integrated skeletons but also created some abnormalities in the spatial organization (3D) of the city. In general, the structure of this texture is a network of main passages with an average width of about three to four meters and have a relatively specified and in some cases almost straight, axis. Their secondary branches, almost with an average width of two to three meters. In this part of the city, the concentration of commercial centers and the increasing of their in number, have caused other uses, such as residential use, not to have balanced growth; and in some cases, the residential uses play the warehousing role, due to the presence of enterprises and stores. Regarding the aging and wearing of residential usages, and due to the residents' reluctance to build and renew them, they have not been developed; and their demanding

populations are of relatively low -income groups.[37]

The buildings in the old texture are generally one-story and rarely exceed two stories. However, four-story buildings were built along the streets that were built to enhance productivity and to provide the historical texture with services. In the current state, the buildings do not follow a certain constructional rule, so that the average segregated pieces of the texture vary from 100 to 300 square meters.

B) The middle texture

formation of the middle texture in Shiraz is related to the urbanization evolution of the early decades of the current century. At the same time as the formation and prevalence of the capitalist system in Iranian society, the old texture area could not adopt the added population anymore. Therefore, at this period of urbanization, we observe some changes in the structure of the existing textures, along with the physical expansion of the city.

In the second decade of the current century, the urban face of the old texture of Shiraz undergone transformation to adapt to the new conditions governing on society. Following the construction of streets, the existing routes and passages of the middle texture were formed faster, in the form of fragmented parts and some spots on the margins of the old texture, more in west and northwest; and this texture was formed faster than the old one. The middle texture was formed around the old texture of the city from about 1921 to early 1961.[38]

As the city grew and spread, new physical changes took place in the old part of the cities. The construction of new streets is the first manifestation of the new urban development, after which the margin of the streets was transformed and new buildings were built, but the inner parts of the texture were less transformed. The stage of the destruction of the old texture started by creating squares in the city center, and the perpendiculars checkered streets.

The separation of lands, passages and access networks in the middle texture have followed a more geometric order than the old one.

The access networks of the texture enjoy more orders in this area, and the problem of old texture traffic is not seen in this area. In terms of spatial texture and aggregation of residential units, the density of units in this area has been reduced than the old texture and the building blocks are more regular. The intermediate texture has more regular and geometric access networks than the old texture, and we can see well, the change from organic design to checkered design and map. The middle texture of Shiraz is often related to the sections built in the period after 1921, and its main feature is the new materials and the use of modern architecture in constructions. This area of the city is located in regular, irregular and checkered forms in the right, north, and west of the city. There is a hierarchy between the passages of this texture in most sections so that the collector and distributor passages have a width of 8 to 12 meters and access passages have a width of 6 to 8 meters. The segments in the regular checkered section are ordered and their average area is 200 to 300 square meters, while the irregular texture does not follow a particular order and the area of segments varies from 80 to 200 square meters. Land use in the range of middle texture indicates that the mainland user is of a residential kind, and the commercial use is seen much less only on the periphery of the streets, compared to the old texture, is much less.

C) The new texture

This part of the urban texture of Shiraz is related to sections built after 1981 in the northern and northwestern part of the city, where construction has been formed up to the last decade. The network of passages of this range is hierarchical so that the collector and distributor network has a width of 10 to 19 meters and access passages have a width of 6 to 8 meters. Most of the buildings formed in this part of the city are more than two stories. The new discontinuous forming texture is checkered due to planning and conducting of construction based on the studies of Shiraz land preparation plan. This texture has been planned more in conformity with regular access networks, to meet the need of car traveling.

[37]Dean of Architecture and Urban Development, o. S. (2004). Revision of Shiraz Detailed Plan. City and Home Consulting Engineers, Architecture and Urban Development. Shiraz: Municipality of Architecture and Urban Development of Shiraz.120.
[38]Dean of Architecture and Urban Development, o. S. (2004). as previous.

D) The peripheral texture

in fact, the peripheral texture that was formed and developed in Iran from 1971 onwards, essentially encompasses dormitory parts and metropolitan suburbs. It was increased following the increase in population, urban migration, and the need for housing and urban growth. The growth of population, especially caused by overcrowded migrations seeking a shelter to reside, created the middle texture in marginal points or outside the city. The urban textures created after 1981, which included the largest city area and accepted the highest population, were called the peripheral texture.

In some lands, such as the northern lands of the city, where mostly middle-income and the high-income population started construction, have maps with more geometric order and the servicing problem is seen less in this area. But in most of the land that has been under construction during this period of time, some texture susceptible to marginalization have been emerged, which are more vivid in the east of the city and less vivid in south and west of the city. The peripheral texture of Shiraz has been formed in eastern and southern parts of the city; and has no definite system and structure in terms of urban morphology. This range of urban texture is not legally authorized to use urban services and infrastructure. These textures were located within the city and its area has been reduced following the reviewing of a comprehensive plan of Shiraz.

F) The satellite texture

formation of this texture began in 1981, culminating in the early 1970s. This section included many towns around large cities. The rapid growth of the city, the prevalence of unconstrained construction and settlement of the immigrant population created many problems. The imbalance between the shaped spaces, the expansion of social and psychological problems arising from the confrontation between cultures and traditions, are among these problems. In fact, these plans have been considered as a clashing action to respond to the growing need for urbanization. This stage of physical expansion of the city is the only step that has been dominated by planning ideas since the inception of its primary sprout formation. The main idea at this stage of the physical expansion was that the urban development overcomes urban growth and creates a new residential complex with the least problems than the districts formed in suburban. Only one town in Shiraz has been built with this feature (satellite texture). The new Sadra town in the northwest of Shiraz, with a distance of m from the historic core, is the only satellite texture of Shiraz, the construction of which began in 1992.

G) The semi-rural texture

another subset of new urban texture in recent decades has been semi-rural texture, mainly formed through the integration of adjacent villages in the city. Perhaps it cannot be said that these textures are new, but it is better to recognize them as rural and ancient textures. This part of the city is related to the villages that have been located within the limit of the city while it was spreading. This texture in Shiraz includes some parts of the west and northwest of Shiraz, were once inhabited by Talkhdash, Qasr al-Dash, and Koshan villages. Although now these regions are known by their own village name, their texture has changed from a totally rural texture to a semi-rustic and in parts to a totally urban texture. The urban structure in this texture is completely new and many parts of it have been destroyed and rebuilt in recent years.

Conclusion

Investigating the change of cities and knowing the process of their formation can be a first step in designing future urban structures. Modern cities in Iranian architecture have been in a crisis of identity and authenticity due to vast changes in structure and morphology. An examination of the historical development of the completion of Iranian cities shows that the evolution of Iranian urban planning has always been based on predetermined thinking and design. This thinking, although subjective rather than drawing, has always grown the city according to its social and cultural components.

Studies on the historical context of Shiraz show that the city has always been shaped and expanded on the basis of Iranian urban patterns from its inception to the late Qajar period.

The city of Shiraz is based on the central model of the foundation and expanded. The development of Shiraz from the beginning of its foundation until the early Safavid era was confined to the city walls. From the beginning of the Safavid era, the expansion of the city to the north and north-west was carried out by the construction of gardens and streets of the royal and "Chahar Bagh".

Despite the expansion of the city to the north and northwest, the pattern of city development continues to be based on the principles of Iranian urban planning. This pattern was maintained until the end of the Qajar era. But with the advent of modernity in Iran, Iranian cities have changed the pattern of urban development due to the acceptance of industry and industrialization of cities.

This change in the structure of the city changed the social and cultural structure of the city. And it made the distribution of services and urban infrastructure unbalanced.

The study of middle and late texture map of Shiraz shows that the morphological structure of the city is broken and inconsistent with other parts of the city, especially with the historical texture.

This restructuring continues and is much more severe in the later tissue. Therefore, it is necessary to carefully study the change of cities, their expansion process, and to criterion for appropriate development and determining the components of development.
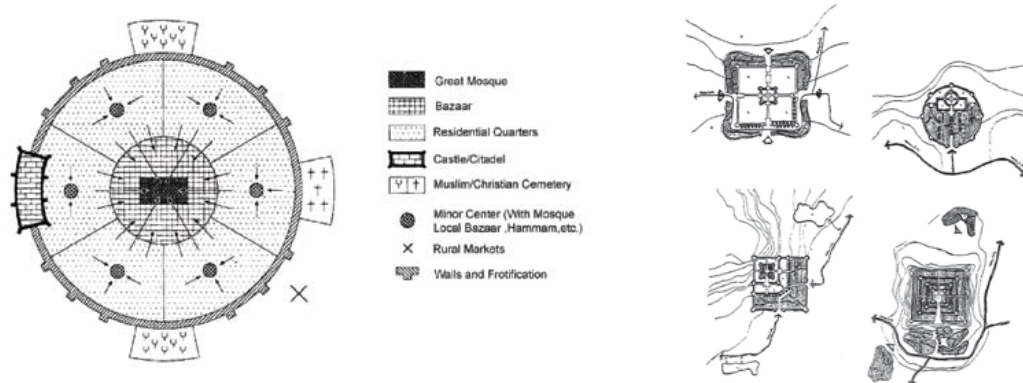
Figure 1. (left) Typical model of Islamic city associated to the Iranian cities Source: Eckart EHLERS and Willem FLOOR, Change in Iran, 1920-194; **Figure 2.** (right up) The physical structure of the city during the Sassanid period on the left, the physical structure of the city during the Parthian period on the right; (right down) The physical structure of the city during the Achaemenid period on the left, the Physical Structure of the City in the Medes Period on the right.
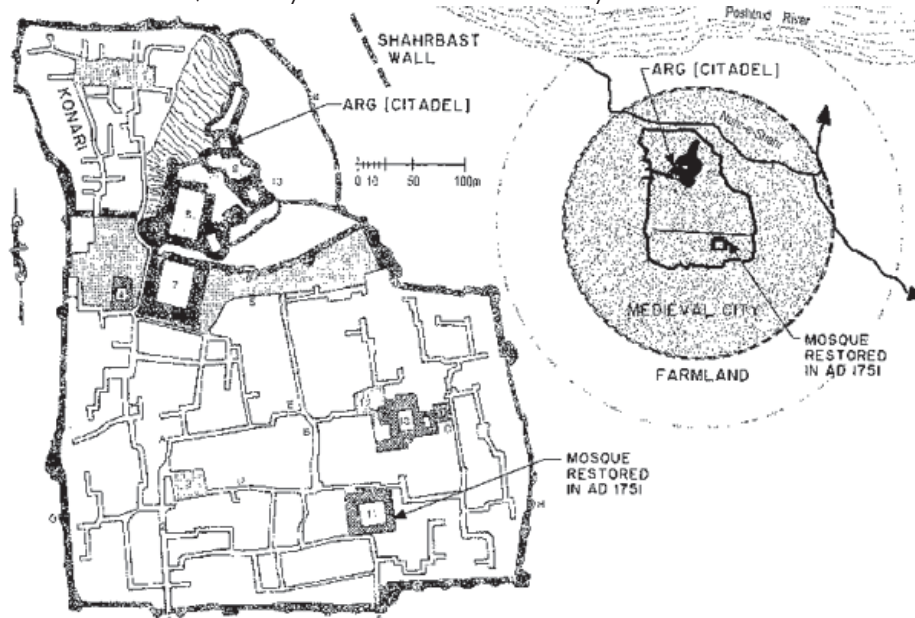
Figure 3. ARG-e-BAM(Bam Citadel) south of Iran.
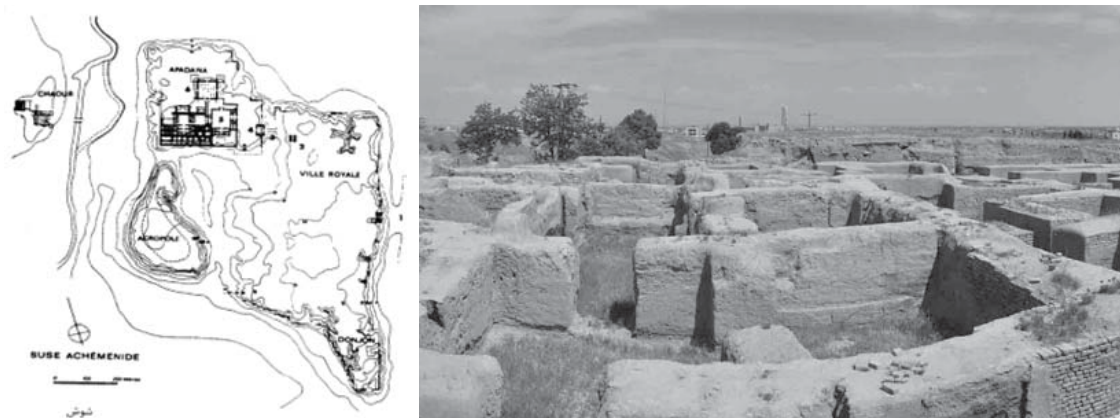
Figure 4. Shush has been one of the military cities of ancient Iran; **Figure 5.** Hegmataneh in western Iran, one of the first cities built in ancient Iran.

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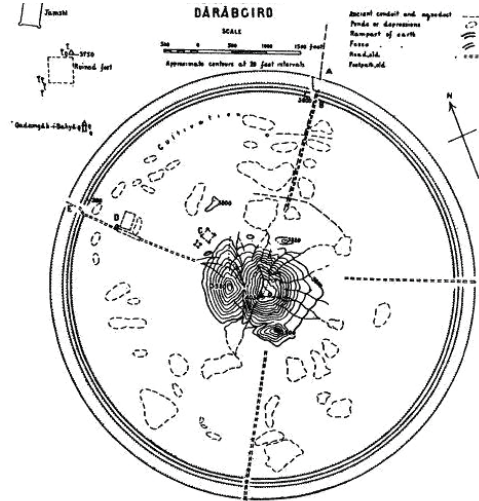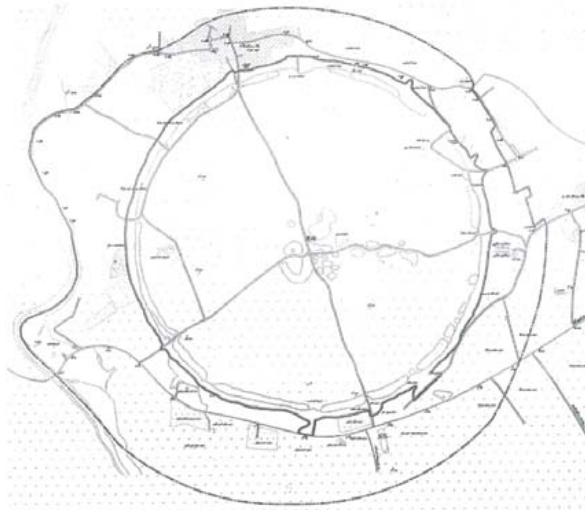
Figure 6. Darabgerd and Goor city are two cities that built during the second period of urban development in ancient Iran.

Figure 7. Aerial photo of ARG-e-BAM(Bam Citadel) south of Iran; **Figure 8.** Aerial photo of Bishapur historical city south of Iran; **Figure 9.** The map of ARG-e-BAM(Bam Citadel) south of Iran.
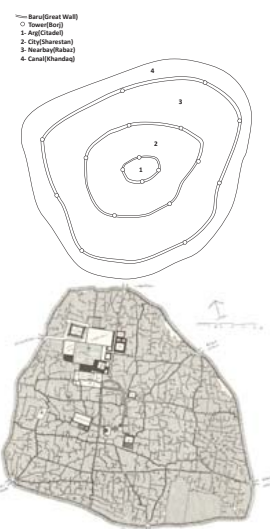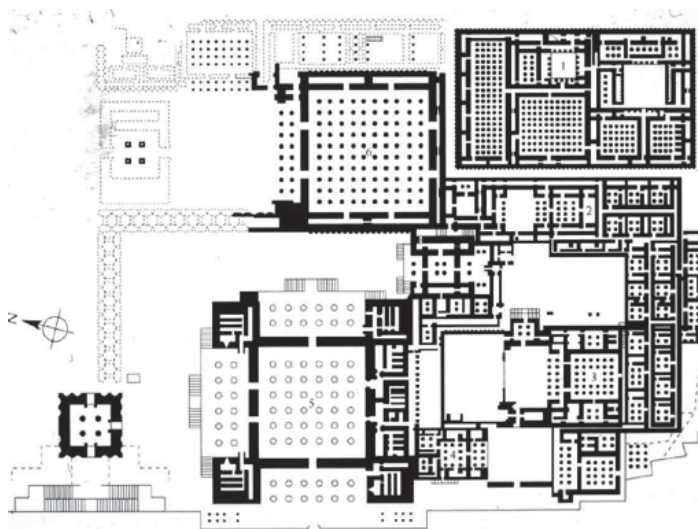
Figure 10. The map of Persepolis (Pars City) south of Iran; **Figure 11.** Hierarchy of Formation of Ancient City Structure; **Figure 12.** Shiraz, the spatial structure of the city 18th century A.D.
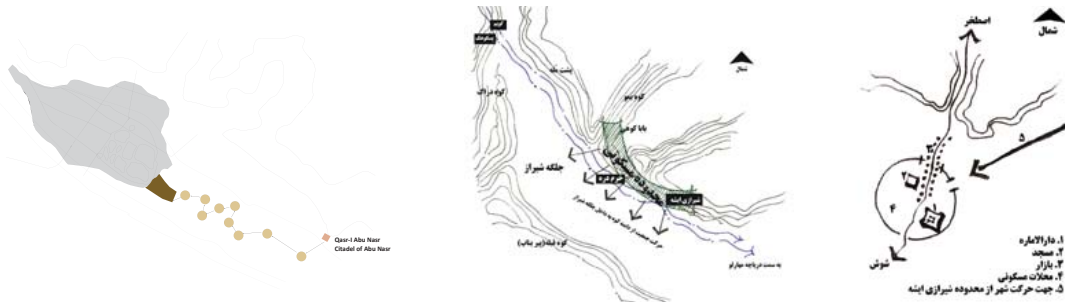
Figure 13. (from left) The historical evolution of Shiraz and its formation at its present location based on historical evidence; Shiraz in the pre-Islamic era; The first step of the formation of Shiraz.

Figure 14. (from left) The second step of the formation of Shiraz; The third step of the formation of Shiraz; The fourth step of the formation of Shiraz.

Period of «Omavian» - 661-750   Period of «Ale Booyeh» - 934-1055   Period of «Saljuqiyan» – 1037-1194   Period of «Atabakan» - 1148-1287

Period of «Safaviyeh» - 1501-1721   Period of «Zandiyeh» - 1750-1796   Period of «Afshariyeh» - 1721-1750   Period of «Qajariyeh» - 1796-1925
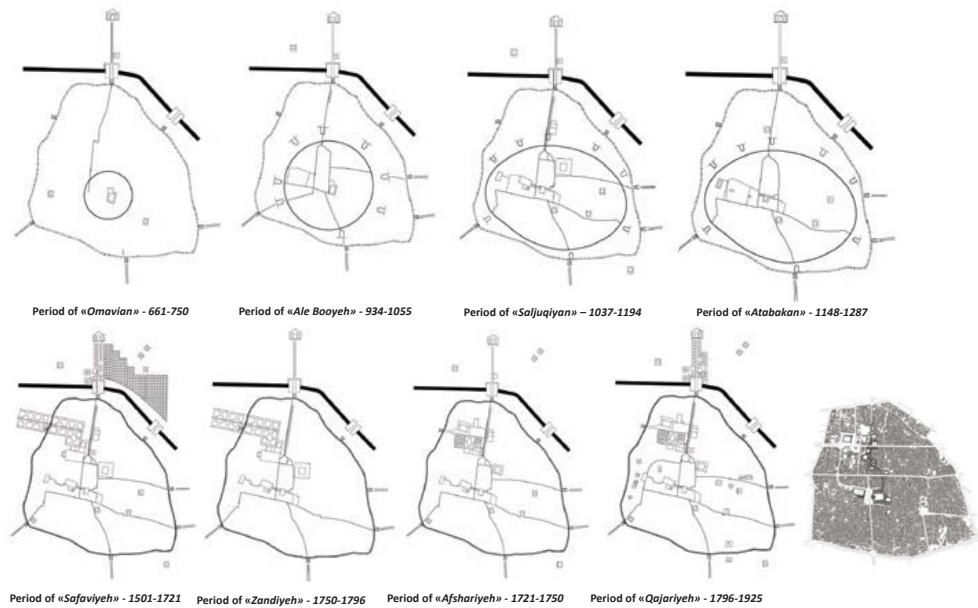
Figure 15. Urban organism - phases of growth of the city of Shiraz in the years 661 between 1925 - Spatial evolution of the old urban fabric.
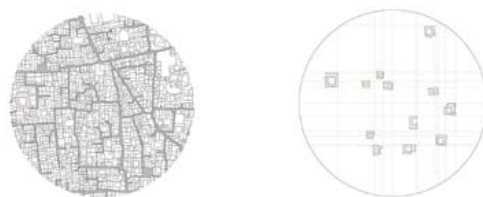
Figure 16. Adaptation of historical texture lines to architectural modulation and architectural units
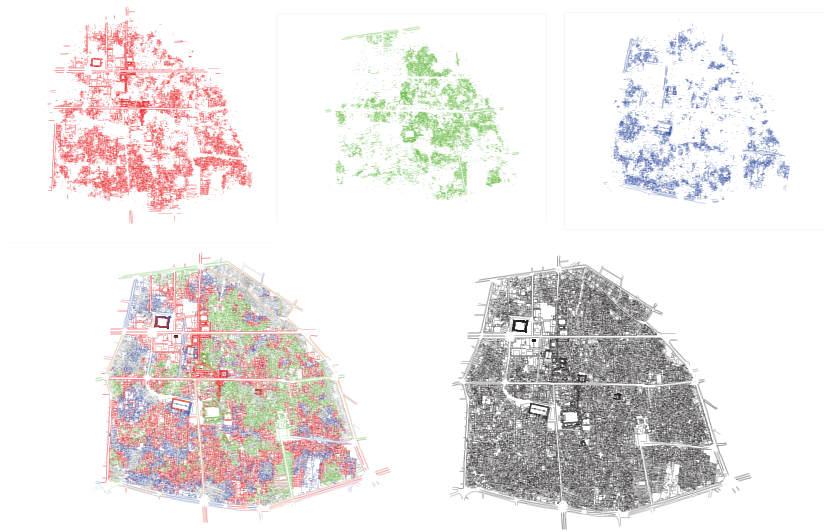
Figure 17. (from left) Read at an angle of 88 to 93 degree covers about 46% of the entire historical texture; Green at an angle of 75 to 80 degree covers about 5% of the entire historical texture; Blue at an angle of 80 to 85 degree covers about 24% of the entire historical texture; The some of the historic building units is 100%; In this study, all units of historical fabric were taken at 100%.

Figure 18. The old texture of Shiraz and its extension to the west and northwest; The new context of Shiraz and its historical context.
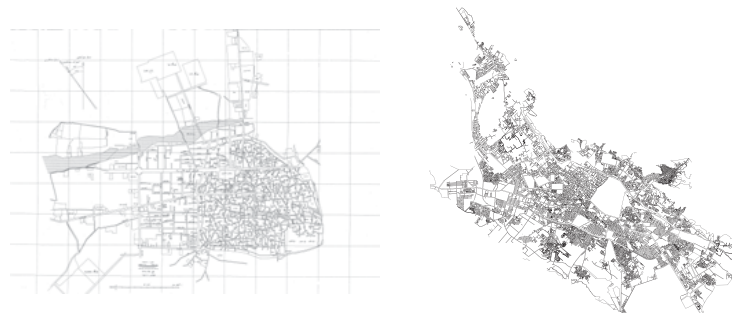
Figure 19. The middle texture - formation of the middle texture in Shiraz on the side of west and northwest; The peripheral texture and The new texture.
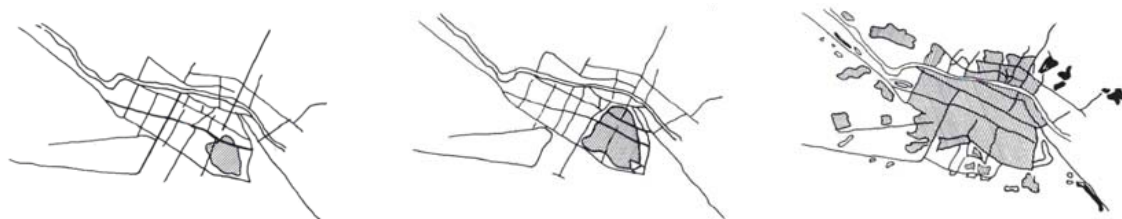
Figure 20. Development of Shiraz from traditional city to contemporary city.

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Historical walls of segregation: a comparative approach on fringe belt as a tool of regeneration

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Keywords: *Urban segregation, Fringe belts, Urban planning*

Abstract

Spatial segregation is an inherent feature of cities and it is even more marked where historical walls together with a fringe belt highlight a tangible boundary dividing the built environment. The fringe-belt concept, first introduced in Germany some 50 years ago, has its origins in the recognition by Louis of the long-term significance of physical limitations on urban growth, notably city walls. Formulated by M.R.G. Conzen and the urban morphology school of the University of Birmingham, it describes coherently the urbanization process and change of status of areas from limits to central zones during the building cycles towards the periphery. Fringe belts are usually substrata and green corridors which also have tourism potential and importance in terms of tradition and sense of permanence, especially if they embedded the city walls. With the aim of enhancing the impact of the urban morphology on the regeneration and planning practice and overcoming the current alienation of such structures within the urban fabrics, this work offers a comparative investigation between fringe belts of Verona and Nicosia. Analysing their historical, morphological, environmental and social effects on the city, a more general framework of the real and symbolic significance will be provided. For guaranteeing a more inclusive and sustainable city development, these key areas should be taken into account as ecological buffer zones of identity in urban planning and included among the enforcement strategies by decision-makers.

Introduction

Segregation is an inherent feature of cities and it remains a long-standing key issue for policy-makers, designers and scholars committed to defining the urban form understanding. Likewise, the international community is called to respond to development challenges in view of ensuring a sustainable future and inclusive society.

Urban segregation generally refers to the spatial separation of people groups defined by one or more dimensions, but the prevalent distinction is made between ethnocultural and socioeconomic differences. Spatial segregation is an interdisciplinary phenomenon that has produced expansive literature in sociology, economics, geography, architecture, and urbanism for at least half a century. Most such studies have their main focus on residential locations, nevertheless both activities and particular needs may affect the sequential city growth. Spatial segregation also acquires different senses depending on the specific urban context and it is even more marked where historical walls together with a fringe belt highlight a tangible boundary dividing the built environment. The fringe-belt concept, first introduced in Germany some 50 years ago, has its origins in the recogntion by Louis of the long-term significance of physical limitations on urban growth, notably city walls. Formulated by M.R.G. Conzen and the urban morphology school of the University of Birmingham, it describes coherently the urbanization process and change of status of areas from limits to central zones during the building cycles towards the periphery. Fringe belts are usually substrata and green corridors which also have tourism potential and importance in terms of tradition and sense of permanence, especially if they embedded the city walls.

Beyond the difference among housing neighbourhoods, this work deals with segregation through the fringe belt phenomenon seeking new uses and identities. Although the existing fringe belts are widely regarded as a physical and metaphysical boundary, the study considers them a timeless icon as well as a potential tool in urban. As a morphological legacy, they represent a space-time continuum able to connect the past city with the future one. For guaranteeing a more inclusive and sustainable city, these key areas should be taken into account as ecological buffer zones of identity in urban planning and included among the enforcement strategies by decision-makers. In line with the 11th Millennium Development Goal (Sustainable Cities and Communities) the historical fringe belts are investigated in order to safeguard the world's cultural heritage, provide new accessible green and public spaces, support positive economic, social and environmental links between urban, peri-urban and rural areas. The research devises the following objectives:

- Advance framework in urban morphology in view of comparative studies;
- Analyse the urban segregation through case studies and understand the mutual interactions between historical walls, fringe belts and the surrounding town;
- Propose historical fringe belt as a vehicle for spatial regeneration and social integration, starting from the urban frontiers to inspire more cohesive upgrading policies.

Paper begins by outlining previous research perspectives on fringe belts and drawing attention to recent attitudinal and policy changes of planning strategies. Then, it offers a comparative investigation between fringe belts of Verona and Nicosia. Analysing their polyvalent effects on the city, a more general framework of the real and symbolic significance will be provided with the aim of enhancing the impact of the urban morphology on the planning practice and overcoming the current alienation of such structures within the urban fabrics

Fringe belt: an evolving morphological concept

The research on fringe belts can be divided into three stages. The first stage was from 1936 to the mid-1960s when the fringe belt phenomenon was identified and articulated by European geographers. Louis (1936) first recognized 'fringe belt' studying the Greater Berlin, this concept have become a topic of investigation by urban morphologists both in Western and Eastern countries, acquiring diverse meanings in relation to an increasing number of political, socioeconomic and environmental changes. As defined by Louis, a fringe belt is a zone of extensive urban land use formed at the edge of an urban area

during a period when the built-up area is either not growing to be embedded within the built-up area during the subsequent expansion phase (Whitehand and Morton, 2006). Although the fringe belt identification is attributed to Louis, Cozen formulated its conceptual framework associated with processes of urban growth in his studies of Alnwick and Newcastle upon Tyne (Cozen, 1960). Conzen's research defined the morphological theory including the fringe belt concept as an entry to the urban complexity (Cozen, 1968).

The second stage of fringe belt studies was between the mid-1960s and the late 1990s. In this period, fringe belts mainly undertaken by geographers and morphologists as historic-geographical markers of cities, interpreting the urban form through distinct functional zones (Whitehand, 1977; Carter and Wheatley, 1979; Rodrigo Cervantes, 1999; Vilagrasa, 1990). Moreover, Whitehand established the relationship between fringe belts and cyclical development (Whitehand, 1967).

In the third stage of research, from the late 1990s to the present day, stress has been placed on the longevity of fringe belts, the inertia of local institutions, and the increasing economic interests (Whitehand, 1987; Whitehand and Morton, 2006). However, greater attention has been given to the use of the fringe belt as a tool of regeneration. The discussion of the fringe belt as a more integrated planning approach (Whitehand & Morton 2003-2006), the place of fringe belts in urban design management (Kropf 2001; Whitehand 2005) and their significance for urban ecology (Hopkins, 2012), are being systematically examined by urban morphologists (Gu, 2010). Recently, several planning policies have been developed for *green belts* within the city. They are generally discontinuous areas but nevertheless ensure the survival of plant and animal species (Hopkins, 2004) to confirm that fringe belts merit consideration in urban landscape management (Whitehand, 2005).

Referring to 'historical walls of segregation', the existence of a fringe belt is important to understand the evolution of an old city which has remarkable ruins. Indeed inner and middle fringe belts were associated with city walls as fixation lines which acted as barriers to the physical growth of the city, such as a city wall or river valley (Barke, 1990). Many European cities provide notable examples of fringe belts embedded within Medieval or Renaissance fortifications (Whitehand, 1988). As geographical consequences of the cities with a long history, concentric fringe areas often emerge with a fractional dynamic and separated from residential districts because they are not only symptomatic of a historical expansion but they are also linked to the economic land use (Barke,1990). The idea of fringe belt formation at times of economic stagnation or slight growth is accepted and equated with periods of slump in the building cycle (Conzen, 2009). The significance of such zones goes far beyond the historic-geographical demarcations of city structure, it has also been viewed in relation to the social motivations that underlie the creation and continued use of many fringe belt plots as hospitals, sports clubs, educational establishments (Whitehand and Morton, 2003). Due to the rapid population increase and the need for new plots, unique characteristics of the fringe belt and historical identity of the city have been destroyed in the newest process called *fringe belt alienation* (Hazar and Kubat, 2015).

Methodology

A town may have several typed of fringe belts. Each fringe belt has distinctive features in terms of origin, plan, typology, pattern, land and building uses. Requiring extensive sites and generally in contrast with the surroundings urban fabrics, fringe belts may be: open spaces (parks, gardens), institutional areas (monuments, walls, reli¬gious centers, hospitals), functional areas (industries, public utilities, infrastructures), low-density housing areas (villas, rural settlements) and recreational areas (sport facilities, cultural poles).

Geographers and urban morphologists support their investigations on the fringe belt by means of thematic maps. Applying this concept on Alnwick and Newcastle upon Tyne, Cozen first identified the fringe belts in three types which have been according to their emergence times, distances from the city center and relations with the fixation lines: inner fringe belt (IFB), middle fringe belt (MFB), and outer fringe belt (OFB). Considered to be fundamental in the development of the morphological structure of the town (Oli-

veira, 2019), these fringe belts were represented through maps highlighting their relation to the built-up area on the basis of specific criteria: position (IFBs-MFBs-OFBs), expansion phase, land use, physical structure and plots, processes. The relationship between socio-economic change and urban form, introduced by Whitehand to explain the rationale of fringe-belt formation, has produced new *cycle models* taking into account the influence of factors such as economy, innovations, and architectural styles (Whitehand, 1994).

While the city grows, the location of the fringe belt plots in the city also changes. The latest studies have shown the potential actions related to fringe belts that may change in physical structure or use, or both. The original function may survive or face either a land-use intensification, to be absorbed by translation to other belts, alienated or expand onto the neighboring sites.

This study focuses on the inner fringe belt (IFBs) as the oldest morphological frame associated with limitations on urban growth as well as a new starting point for city regeneration. These areas, defined by MRG Conzen as 'fixation lines', have been formed around the historical core, the city wall, and fortifications. IFBs are inherently more complex than MFBs and OFBs because of their long gestation and vulnerability (Conzen, 2009). Therefore, they require attention more than other urban zones: their physical legacies embody both the local identity and the urban segregation. The research is carried out using a comparative approach between the cities of Verona and Nicosia. The selection of case studies is supported by similarities and differences which facilitate their comparison, such as:

- historical origin and type: IFBs date back to the same period of Venetian domination, established as 'fixation lines' (fortification walls);
- cultural context: Western *vs* Middle Eastern urban culture and planning practices;
- features: form, potential, land use and processes.

The IFBs of both cities have been read and evaluated according to four 'macro-qualities' based on their historical, morphological, environmental and social impact on the city, for the purpose of making the existing fringe belt a key tool in cityscape regeneration and planning policy. From an evolutionary perspective, in the following section, each city is presented through the IFB formation and modification.

Historical fringe belts (IFBs) of Verona and Nicosia

Under the rule of the Venetian Republic, traditionally known as 'La Serenissima', Verona and Nicosia experienced almost one century of wars, but they also shared a common culture as both of their urban forms show. (Fig.1).

Since its origins, Verona was indissolubly linked to its urban structure, streets, and architecture. It is an outstanding example of progressive development within and around walls of the highest quality from each succeeding period. Verona was founded as a military *castrum* at the crossroads of the Postumia (*Decumannus Maxumim*) and Claudio-Augusta Roman (*Cardo Maxumim*) roads and became a Roman colony in the 1st century BC. These roads were the axes of a system that linked east to west and north to south and that had in his middle Verona. Today, the highways that pass through Verona, are based on the ancient scheme called today Milan-Venice and Modena-Brennero. A series of minor "cardi" and "decumani", parallel and perpendicular to each other, drew a typical regular grid, rising rapidly in importance so much that had to implement appropriate defense systems. Over the centuries, the urban growth was associated with three walls. According to the most recent historical sources, the first section of walls dates back to the late Republican era: 900 meters long. In 265 AD, due to the threat given by the Alemanni, the emperor Gallienus decided to carry out a great restoration project of the walls, whose conservation, after almost two centuries of peace, was in a very bad state. The well-known 'Walls of Gallienus' included the Arena with its strategic importance, entrenching only the southern part of the city because in the north, west and east, the Adige River provided natural protection. The Roman walls served as a defense of the urban core for many centuries, until the establishment of the Municipality in the XII century when it was decided to build the second 'fixation line'. It was prolonged to protect the latest settlements on the eastern river bank. At the behest of Scaligers, in 1323 the

third ring of fortification was built embracing a much larger territory in the south and the hill on the east bank of the river. It included high crenellated walls, towers, and ditches. This remained the size of the city until the 20th century. During the following centuries, previous walls were embedded in the urban fabrics and kept being modified and renovated, first under the Venetians and then under the Austrians. Verona remained under Venetian control for almost four centuries (1405-1797) and it became "the strongest city in the Venetian state", thanks to the architect Sanmicheli who introduced a complex fortified system consisting of important technical innovations (1517-1565). The art of war, no longer based on arrows but on cannon fire, required low and thick sloping walls and embankments: the southern 'fixation line' was strengthened and decorated with portals, while the northern one was equipped with bastions and circular towers (e.g. Rondella delle Boccare, 1522). After the fall of the Napoleonic regime, Verona switched to the Austrian Empire and joined the Kingdom of Italy in1866. The Venetian walls persisted until the beginning of the nineteenth century when the French, retreating on the east bank of Adige, destroyed most of the architectural legacy by Sanmicheli, such us San Peter and San Felix Castle. In 1830, the Austrians commissioned the engineer Von Scholl to update the whole fortification walls to reconfigure the city as a strategic and military node. The city wall was reinforced with polygonal bastions, 'Carnot' walls, barracks. Throughout the countryside, 31 forts (19 of which still existing) formed the outer and most modern defensive ring, well known as the *rideau* (Fig.2). The walls surrounding the city prevented the subsequent development such as industry and railroads within the urban core. The city's historic fabric remained intact until World War II. Although Verona's buildings suffered significant damage, the post-war reconstruction plan (1946) maintained its original structure by showing exceptional coherence and a large degree of homogeneity. In 2000, Verona was declared World Heritage Site by UNESCO for its urban structure and its architecture, as a fortified town at several seminal stages of European history it represents an open-air military museum. For decades the city walls were perceived as an obstacle to urban growth and a rejection of foreign domination, whereas policy-makers put them in planning theory by ignoring them in practice. Today, a recovery effort has been started by a group of international volunteers in cooperation with local bodies in view to turn the western section of the walls into a linear green park and valorise the Scaliger, Venetian, and Hasburg substrata. Yet planed top-down actions are as urgent as they are necessary.

Nicosia, originally known as Ledra, has been in continuous habitation since the beginning of the Bronze Age 2500 years BC when the first people settled in the fertile plain of Mesaoria next to the old Pedieos River. During the Byzantine domination (390-1191AC) the city became the bishop's seat with the current name of Nicosia and then the Cyprus capital. Nicosia embodied the characteristics of an agricultural feudal system included the city wall and multi-storey square towers at regular intervals built under the frank Peter II (Lusignan period, 1192-1489). Cyprus became part of the Maritime Republic of Venice in 1489. After the Great Siege of Malta in 1565, when fears of Ottoman expansion increased, the governors of the city emphasized the need for the city to strengthen their fortifications. In 1567, new walls, designed by the Venetian engineers Giulio Savorgnan and Francesco Barbaro, replaced the Franks ones and encircled the old medieval city. The Venetians were inspired by the ideal cities of the Italian renaissance: a 'star fort' of a diameter of 7 km interrupted at regular 260 mt. intervals by eleven pentagonal bastions, named after the Italian aristocratic families who funded their construction. The same model shaped undecagon regular was revived by Savorgnan in Palmanova (1593), a northeastern Italy city under the Venetian domination, included in UNESCO's World Heritage Site list as part of 'Venetian Works of Defence between 15th and 17th centuries'. Due to the renewed war technologies in that time, the new walls of Nicosia were higher and larger than the Lusignan walls, this led to the demolition of several buildings within the city as well as the deviation of Pedieos River outside the city to protect the residents from flooding and to fill a new moat surrounding the city wall. A new urban tissue gradually replaced the riverbed, flanked by the sinuous streets that followed its former course inside the ancient city. Ottomans began the siege of Nicosia in 1570 when the fortifications were

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still incomplete and the insufficient number of troops to control eleven bulwarks. In continuity with the precedent administration the Turkish renovation of the city, used some of the areas above the unfilled river. Since then, this area became the city centre. Although the Ottomans repaired the fortifications after the siege, by the early 17th century, the city was practically defenseless. It was still confined within the walls when the British occupied Cyprus in 1878 (Fig.3). An opening was made near Paphos Gate in 1879 to facilitate access to the surrounding area and further openings were made within the walls during the 20th century. After decades of struggles for independence, Nicosia became the capital of the Republic of Cyprus, a state established by the Greek and Turkish Cypriots. The peaceful co-existence between two opposite factions was merely apparent, thus a United Nations Buffer Zone was established in 1964 and extended in 1974 following the Turkish invasion of Cyprus. It is a security and demilitarized zone, still patrolled by the United Nations Peacekeeping Force in Cyprus (UNFICYP), that marks de facto partition of the island into the area controlled by the Republic of Cyprus and the unofficial Turkish Republic of Northern Cyprus. This zone, also known as the Green Line, stretches for 180 km crossing Nicosia in correspondence to the natural path of the Pedieos River through the medieval center: later diverted and paved over to create the main commercial arteries, it includes the city's most valuable areas (Calame and Charlesworth, 2009). Nowadays, Nicosia is emblematic of urban segregation made concrete in two inner fringe belts: preserved from 1567, the Venetian walls represent a historical and physical limit to urban expansion; instead, the Green Line testifies to populations, cultures, policies come here from the east and west of the Mediterranean unable to find a a balance in freedom.

A short evaluation

A scoring system has been created to compare the Inner Fringe Belts (IFBs) corresponding to 'historical walls of segregation' of Verona and Nicosia. Four main macro-topics have been chosen to evaluate the urban qualities of these areas: historical, morphological, environmental and social value. Data have been collected by observation in situ, maps, photos, documentary sources and analysed through a rating system that included four macro-areas divided further into four sub-criteria related to the main fringe belt characteristics, to each of them have been awarded points within the range of 0-5. Outcomes, obtained by Excel spreadsheets, have been compared with an *Optimum* value of 80 points in which all positive values scored 5 points (Table 1).

Historical value (H1-H4) of city walls in Verona and Nicosia cannot be denied though with some differences. The IFbs of Verona represent an older substratum than Nicosia ones: recognized as World Heritage, they not only show the geographical key-role played by the city over the centuries but also the overlaying of past dominations (Romans, Scaligers, Venetians, Austrians). Several physical structures testify to the changing life and military styles: Verona is a manifest example of how the Italian manner to build fortifications was perfected by Germany, Dutch and French theorists. The newest political forms of IFBs in Nicosia have overshadowed the historical walls which remain one of the most important landmarks to be preserved.

According to the morphological framework (M1-M4), the historical fringe belts have been a clear limit in the urban development process. After fixation and expansion phases, they are experiencing a long-lasting consolidation period. In both cases, IFBs caused any discontinuity in pattern and use of land. The city walls of Verona can be so integrated into the built environment not to be discernible easily (medieval walls) or be so foreclosure to form a non-stop natural fringe belts jointly with the Adige River (19th-century walls). On the one hand, the fortified ring in Nicosia has preserved the original urban core, on the other hand, it has created an evident time-gap in types and functions outside the walls. Nevertheless, both the land-use change into green, cultural or institutional areas and the fringe-belt alienation are related to the wider building cycle of the city in total.

Among analyzed qualities, the environmental one achieved the highest score (E1-E4): town walls of Verona and Nicosia are surrounded by spontaneous green areas offering pedestrian itineraries. Nature often hangs over any abandoned structure which needs more safeguard. However, both green fringe belts have strategic importance being

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ecological corridors to be protected.

The IFBs are not always perceived as public parks, more often lived as a passive presence. The Verona walls are partially been recovered and monumentalized through the museum project by Carlo Scarpa, but in many parts are inadequate in terms of collective memory accessibility, sense of security (S1-S4). The Venetian walls of Nicosia represent the landmark of an interrupted city, divided between the inner ancient core and the external modern city. Integration became synonyms of indifference, while military troops at city gates affect mobility and security paradoxically.

This comparative study on IFBs of Verona and Nicosia revealed that:

- Urban fringe belts are *buffer zones* formed during the cyclical urban development. Once consolidated IFB is subject to land-use change and fringe-belt alienation;

- Fringe-belt alienation is more apparent in IFBs including city walls and green areas, they are the materialisation of spatial, social and economic segregation;

- Historical walls have made IFBs untouchable open spaces no public parks, infrastructural barriers, urban voids. Recovery and renovation actions are recent and incomplete;

- Decision-makers and citizens seem to ignore the multiple values of IFBs, they provide historico-architectural heritage, continuity in morphological process, ecological greenways, common identity.

Landscape projects are crucial to maximizing city wall use, protect its history and increase public awareness with the aim to promote tourism. IFBs may be planned as green belts and public spaces: from the Wien Ringstraße to the High Line in New York, IFBs renew the main principles of Urban Planning in the XX century, perfectly consistent with the latest trend of New Urbanism (walkability, connectivity, mixed-use and diversity, etc.). Thus, without losing their inherent character, the IFBs should be considered essential tools for regeneration policies, by preserve the geographical structure of cities, providing quality in public and green spaces, and guaranteeing sustainability in urban growth.

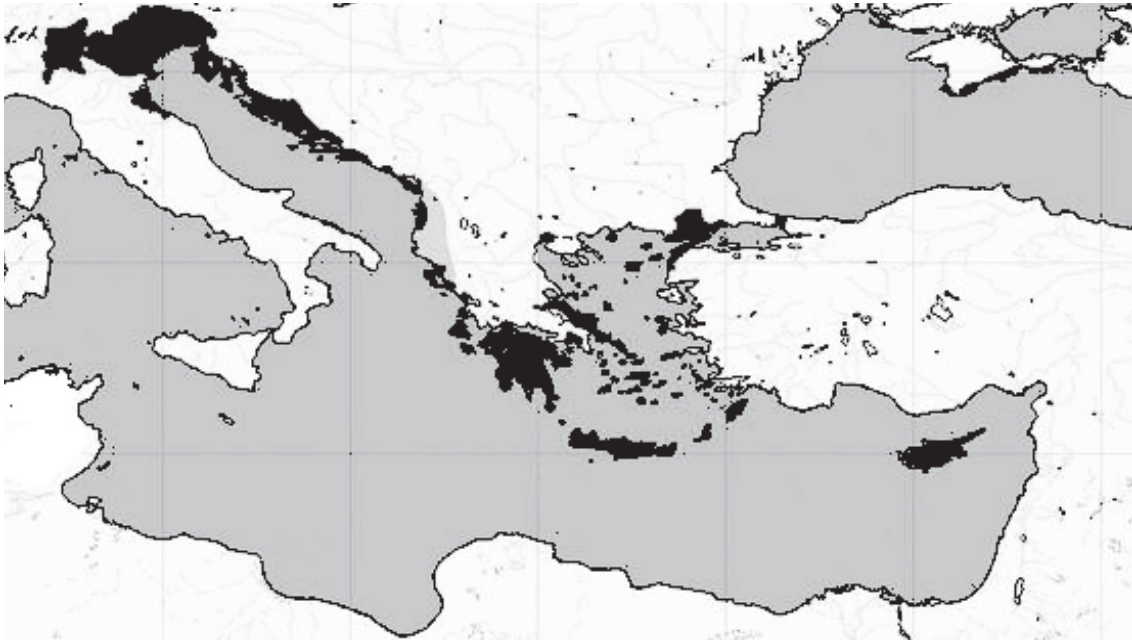**Figure 1.** The Republic of Venice (maximum extension, XV-XVI cc).

Figure 2. City walls of Verona.

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Figure 3. City walls of Nicosia.

Qualities	N	Verona		Nicosia	
		Score	Optimum	Score	Optimum
HISTORICAL	H1_Oldest Age	5	5	3	5
	H2_Substrata/Heritage	5	5	5	5
	H3_Physical Structure	4	5	4	5
	H4_Preservation Status	4	5	4	5
	Sum	**18**	**20**	**16**	**20**
MORPHOLOGICAL	M1_Consolidation Phase	5	5	4	5
	M2_Recovery	3	5	3	5
	M3_Land-use change	3	5	3	5
	M4_Infrastructure/Facilities	4	5	3	5
	Sum	**15**	**20**	**13**	**20**
ENVIRONMENTAL	E1_Areas to be protected	5	5	5	5
	E2_Landscape integration	5	5	4	5
	E3_Ecological Value	5	5	5	5
	E4_Sostenibility	4	5	4	5
	Sum	**19**	**20**	**18**	**20**
SOCIAL	S1_Accessibility	4	5	3	5
	S2_Security	4	5	4	5
	S3_Identification/Memory	4	5	4	5
	S4_Utility/Potential	4	5	4	5
	Sum	**16**	**20**	**15**	**20**

Table 1. IFBs comparison, scoring system.

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Morphological development in historic context in German St Francis convent development 2030

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Keywords: *architecture heritage sustainability*

Abstract

German Convent of St Francis of the nuns in Reute Bad Waldsee in Germany is undergoing the demographic shift typical for convents in this day and age whereas 30 years ago the convent had over 600 nuns and has over 28 buildings that formed half of the entire village in the South of Germany. The convent has now a mere 289 nuns left and will in ten years only have 28 nuns due to the aging nun population. The attraction to join a convent and the role of religion in our society has changed and will keep changing. The architectural and urban design challenge hence to repurpose the complex in a manner to maintain the core values of the convent, ensure safe-keeping the history of the convent and creating a new center for the community. Following a historic, archaeological and assessment of the future requirements of the convent and the community, it was decided to convert the complex in a manner to form a new center. Making it attractive to be there and filling the complex with life. *The project is phased over ten years first to establish the core of the historic convent in the heritage listed building, reducing the over 12 churches in the complex to 3-4 and ensuring a sustainable transition of the current religions buildings in a multi functional use complex, with a pilgrimage, café, hotel and NGO foundation headquarter, allowing to remove some buildings to form a new community place for people to gather and enjoy being in this historic complex. The architectural challenges were that no accurate plans existed of building nor the several underground connecting tunnels that crisscross the convent hill. The design and construction in a historic context and revitalization and contemporary demands on sustainability and economic efficiency became the design parameters to enable future proof project. This project is phased and will be translated over a period of ten years. I act as consultant to the convent as a guide in the development and in the hope that this initiative can provide a role model for other convents and monasteries in Europe.*

… to remember

The Convent from St Francis had been founded by 5 nuns initially in 1403 headed by saint Beth (Gute Beth) Elisabeth Achler, whose remains form now the core of the pilgrimage site with the blessed water well. During the secularization in 1784 the convent was closed. Reopened by nuns coming from Schwaebisch Hall- Comburg to Reute in 1869. The convent community grew by 1940 to over 1786 nuns. The beginning of the 21st century is signified by the aging demographics of the convent community and with it the reduction of number of nuns. 2020 just under 300 nuns remain with an average age of 72 years old. The convent has several outlets within Germany, as well as Indonesia and Brazil.

The number of young nuns adjoining is few, one a year that follows her calling. In times of high commercialization few will choose an opposite path of serving others and finding a path to inner peace. The cloister mountain has an active urban community due to having its own bakery, and confiserie, butcher shop, cloister shop, religious textile manufacturing, garden shop, café opening all to the convent community and related activities in future these should be open to the public and accessible, forming its own microcosm together with the organic farming done by the leaseholder of the convent grounds.

The question why to intervene is easy to answer since the convents demographic over-aging and rapid decline in numbers the convent is faced with the question what and how to maintain the cloister mountain. By 2030 28 nuns should be left in the community.

…'The mother art is architecture. Without an Architecture of own we have no soul or our own civilization'…[1]

A thorough analysis was carried out for the buildings and functions, urban design wise, technically, architecturally as well as economically. For example, the large kitchen that provides food for various surrounding institutions is working on a financially loss basis, the seminar and hotel facilities requires an interior design overhaul to ensure that the facility is fit for the future. The main question raised was, where will the nun community be located, the easy answer would have been in a new building at the bottom of the cloister mountain this would be most cost effective, would ensure best solution of a small number of the nuns' community. However, watching the cloister hill buildings crumble or be reused by whoever bought the 28 buildings was not an option for the nuns. They decided to move closer to the core i.e. in the oldest part of the convent. Next questioned posed was then how will the other buildings be reused what would form a cohesive, holistic, sustainable community following St Francis principles to be truthful to the rich history of the cloister mountain. Third question was how to finance and manage the transformation.

…to inspire:
…'The journey is essential to the dream.'…[2]

The Convent of St Francis in Reute is attempting to inspire other convents and monasteries that have a similar fate aging demographics and ever reducing community members to find a way forward to maintain the buildings, as well as their core religious community on the one side and pass on the belief and heritage to future generations. Doing this in a sensitive, sustainable and modern manner. The cloister mountain sits on 60 hectares of ground that is predominately leased out for organic farming. Around the cloister mountain is the village of Reute with about 2,375 people. On the grounds of the convent in sight is also the archeological site of a settlement dating back to 38th century before Christ, with over 7,000 artifacts and basis of buildings that have survived in the peat soil.

The project 2030 St Francis convent Reute has at its core that the community has to be reactivated and vitalized.

…'With a basic understanding of all humans as brothers and sisters, we can apprecia-

te the usefulness of different systems and ideologies that can accommodate different individuals and groups with different cultural heritages, having different dispositions and tastes. Each person has the right to choose whatever is most suitable, on the basis of a deep understanding of all brothers and sisters.'...[3]

How is this being done by:

1.   Historic core development bringing the Franciscan nun community together in the oldest part of the convent that leads back 500 years.

2.   Pilgrimage of the "good Beth" to be center around the water well, that has healing properties. The Good Beth was the founder of the convent that has a sainthood status. Her body is barred up in the village community church located on top of the convent mountain in midst of all the 28 buildings. The pilgrimage site to be further developed in conjunction with the cloister garden, café run by handicapped and herbal maze garden. A future museum on the history of the convent, Saint Beth and the long cloister site.

3.   Saint Elisabeth Foundation Headquarter, this will be housed in the current old-nuns-nursing quarters and brothers- priests' quarters.

4.   Seminar and hotel to be interior design and sustainability wise updated from the last renovation in the mid 1980's.

5.   Time out house for stressed members of the public community to be renovated to meet future standards and needs.

6.   Deconstruction of 2-3 larger current nuns' quarters to the foundation to provide a visual link of the cloister mountain to the archaeological site. Reconstructing the former visual axis that the site has held to the surrounding countryside and view axis to the alps.

7.   2-3 of the adjacent farm grounds to be deconstructed to provide public spaces for the community connection as well as during weekdays parking opportunities for the cloister mountain activities.

8.   Unresolved is the handling of the archaeological site close by on land of the convent.

… to innovate:

...' Start by doing what is necessary; then do what's possible and suddenly you are doing the impossible.'...[4]

The convent is very active and serves via diverse institutions under the Saint Elisabeth Foundation over 4,500 people in Germany alone and employs over 1,000 people with disabilities and trains over 100 young adults in professions alongside professional training institutes.

The 2030 St Francis Reute Bad Waldsee project aims to achieve a truly sustainable redevelopment of the convent from 28 buildings to focus the cloister into 2 buildings and make the remaining cloister mountain in a sustainable units that form a cohesive social cultural and religious center for the community at large that the Cloister can relate and the community can benefit from culturally, the organizational headquarter positioning to give it also an economic and diverse addition to the life on the cloister mountain.

The cloister mountain is not self-contained as St Mont Michel in France but rather visually and daily connected to the life of the community by the provision of employment, religious retreat connection to nature.

The cloister mountain in 2030 will provide an interjection of diversity of people, provide diverse employment opportunities, be inclusive to employ physically and mentally challenged member of the surrounding region– an architectural challenge for the layered construction but goes in line in converting the convent and the older parts of the aging population of the nuns that have similar requirements. Activating the mountain with non-profit organizational work through the Saint Elisabeth foundation, the retreat seminar facilities and the retreat house and the healing cloister garden maze with healing products being developed and sold through the shop there.

Urban design wise rebuilding a historic center that disappeared by overbuilding that can now re- enlivened.

Architecturally the design enables a sustainable upgrade of the project to future pro-of the development. Simplification in design will allow refocusing and purification of the design and the experience of the cloister mountain.

…'I call architecture frozen music'… Capturing the spirit of St Francis and the rich history of the site and people that contributed to the cloister mountain over the years and design this into the new refurbishment of the convent.

Heritage wise the development is a challenge so for the first part of the

Interior design it will be centered around a simplification and modernization that will enrich the experience whilst allowing a focusing on the spiritual dimension of the project that is at the core.

…'We shape buildings; thereafter they shape us.'…[5]

Phased approach:

First phase is the redesign and construction of the core project for the nuns in the oldest part of the cloister mountain and should be completed by 2025.

Second Phase the foundation headquarter can only be taken on once the first phase is completed so the nuns nursing area can be relocated into the core project by 2030.

The third phase is the redesign and upgrade of the seminar and retreat hotel area is dependent on third party co investment to ensure the successful completion and hence is time independent.

Finances:

Often we do not want to talk about money but a necessity of life the actual conversion and financial and project management side. The convent has managed to secure 50% of the required funds for phase 1 of the project. The costs for this particular phase are the highest since it deals with the oldest part of the convent and hence has many heritage issues to be considered that are making the project more expensive and time consuming in the construction.

The Headquarter relocation from Bad Waldsee to Reute will be carried by the Saint Elisabth foundation. The cost for the seminar and retreat reconstruction will be carried in parts by the convent and potentially supported by third party.

For funding diocese, municipal/ governmental funding are being explored together with heritage funds and third party engagement is crucial to ensure the success of the 2030 St Francis Reute Project.

…to reflect:
…'Architecture is reaching out for the truth.'…[6]

The approach to assess and analyze the situation in a proactive manner to secure the living on of St Francis convent and a revitalization of the Cloister mountain would not have been possible without the vision of the St Francis nuns board that proactively approached the issues the convent is faced with in todays' world where religion is secondary allowing the core to survive and to re-activate future generations to come making it central for future generations.

…'Each new situation requires a new architecture'…[7]

Architecture is the mere place holder mirror enabler reflecting this unique historic constellation and future outlook. Or as Ian Pei put it, …'Life is architecture and architecture is life.'…

Saint Francis phrased it the following… 'Remember that when you leave this earth, you can take with you nothing that you have received- only what you have been given: a full heart: enriched by honest service, love, sacrifice and courage.'…[8]

...to look ahead:
...'In the coming decades, questions of identity, meaning cultural heritage, language, and religion will play a central role in politics.'...[9]

Architects we also will need to assess what is 'worth' spending our time on more banking and commercial projects or constructing sustainable communities to provide place to be and live culture. The St Francis convent project 2030 does exactly this facing the challenge and preparing for the next generation, following therewith a long tradition that we all seemed to have overlooked to design and build for the ones after us not just us.

Figure 1. Historic core development.

Figure 2. Design Timeline.

Prof Gisela Loehlein
XJTLU ARCHITECTURE

**ST FRANCIS CONVENT
REUTE BAD WALDSEE**

Design phase 3:
Landscape plan

Design phase 5:
Hotel & cafe development in
plans and sections
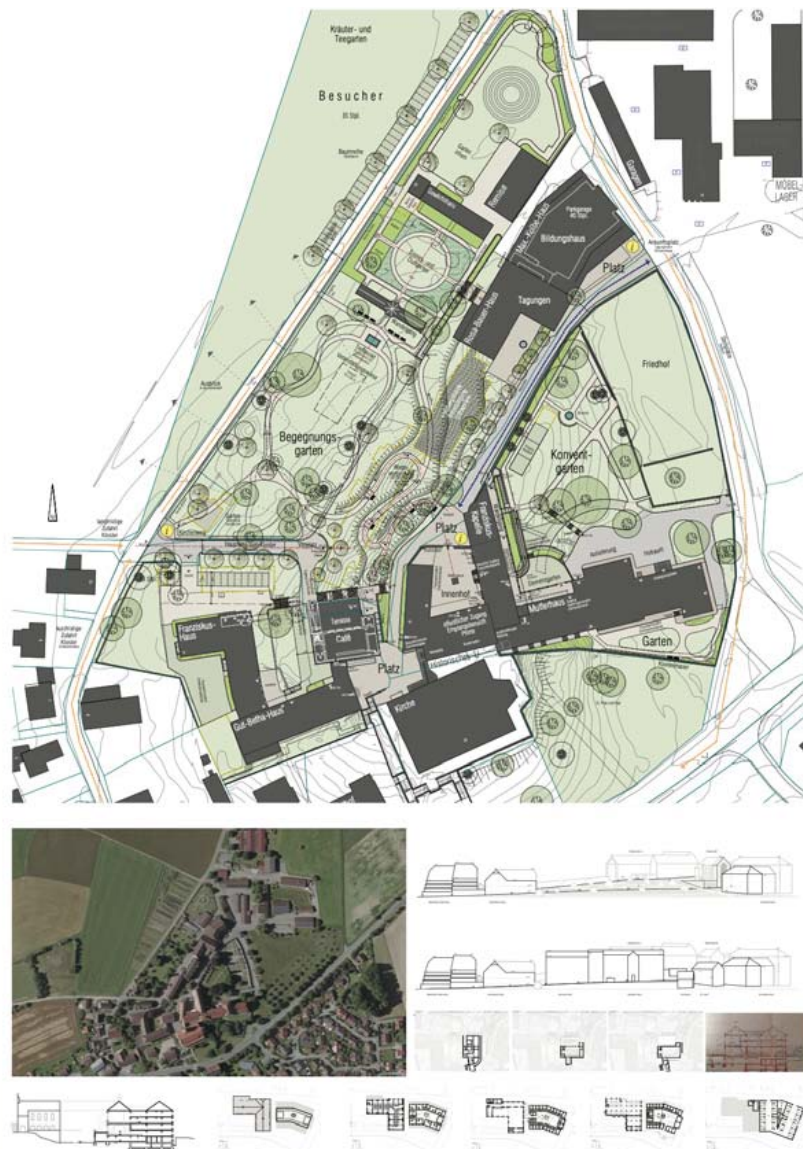
Figure 3. Landscape Plan.

Footnotes

[1] Wright, Frank Lloyd, USA

[2] St Francis, Assisi, Italy 13th Century

[3] Dalai Lama, India

[4] St Francis, Assisi, Italy, 13th century

[5] Churchill, Winston, UK

[6] Kahn, Louis I, USA

[7] Nouvel, Jean, Paris, France

[8] St Francis, Assisi, Italy 13th century

[9] Huntingdon, P. Samuel

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Croquis, Jean Nouvel 2007-16, contemporary reflections Band 183

The concept of "trullo type" in the formation of Alberobello urban organism

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Abstract

The proposed topic is the result of research carried out within the Degree Thesis Laboratory - final Workshop promoted in the Dicar Department of the Polytechnic of Bari. The study deepens the formation of the city of Alberobello, a UNESCO site located in the Murgia dei Trulli, and analyzes the characters of the building types present in the perimeter of the monumental area. Laboratory research focused, in particular, on the "concept" of the trullo type widespread in the historical building of the city, in the two initial settlement systems - Rione Monti and Aia Piccola - separated from the ancient style, today Largo Martellotta. This typology, originally created to meet needs related to the productive-agricultural activity, has changed over time generating different structural modalities, both in the configuration of the space for domestic use, and in the relationship between several basic units aggregated in series on a path or on a common area to configure the "neighborhood". The analytical study of the building units present has made it possible to reconstruct an abacus that includes the main types and the synchronic and diachronic variants. The recognition of typological differences was also useful for a further investigation: the reconstruction of the

phases of tissue formation consisting of spontaneous and planned aggregate nuclei. With an in-depth study of the type of trullo with a cone-shaped pseudo-dome roof, the "house concept" in force at that time and in that specific place was identified, consisting of a main room intended for daily activities and

two small spaces: the alcove, reserved for night rest, the focarile for cooking food.

Starting from this elementary configuration, some variants are gemed with the addition of additional spaces, often also covered in trullo. It follows that the housing unit, in its present state, sometimes shows complex configurations obtained by doubling the elementary cell with the addition of additional spaces.

The proposed study aims to demonstrate the effectiveness of the results obtained by using the typological-process analysis tool in the recognition of anthropic structures, a fundamental basis for starting a tissue recovery project also thinking about its possible/potential congruent transformation.

Introduction

The research based on the city of Alberobello has been produced within the activities of the Thesis Laboratory, coordinated by Prof. M. Ieva and the undergraduates M. Digioia, G. Gorgoglione, G. Indrio, D. Lasorella, F. Leone, R. Regina, F. Schiavone in the Degree Course in Architecture of the Polytechnic.

The research deepens the formation of the city of Alberobello, Unesco site located in the scenery of the Murgia dei Trulli, and it analyzes the characteristics of the types of buildings present in the perimeter of the monumental area.

The study produced, describes the "concept" in particular of the type of trullo used in the historical building of the city, in the two initial settlement systems - Rione Monti and Aia Piccola - separated by the ancient watershed, today called Largo Martellotta. This typology, originally created to meet the needs related to the production-agricultural activity, has changed over time, generating different structural modes, both in the configuration of the space for domestic use, and in the relationship between several basic units aggregated in series on a path or on a common area to configure the "vicinato" (as neighborhood).

The analysis of the building units present allowed to reconstruct an abacus that includes the load-bearing types and the synchronic and diachronic variants.

With an in-depth analysis of the character of the type of trullo[1] with a cone shaped pseudo-dome roof, the "concept of home" in force at that time and in that specific place was identified, consisting of a main room intended for daily activities and two small spaces: the alcove, reserved for sleeping, the focarile (as kitchen area) for cooking food.

Starting from this elementary configuration some variations are budded with the addition of additional spaces, often covered with trullo.

The proposed study, therefore, aims to demonstrate the effectiveness of the results obtained by using the instrument of typological-process analysis in the recognition of human structures, a fundamental basis for starting a project of tissue recovery also thinking about its possible and congruent transformation.

Reading of the trullo

The settlement of Alberobello, in its initial layout, presents a type of building - the trullo - of ancient origin, aggregated with a law that was initially consolidated in the rural aggregation system.

In fact, the dry masonry construction and pseudo-dome vaulted roof that defines the type of "masseria" (as large farm) of the Itria Valley represents the model of behaviour of the primitive settlement that, in progress of time, gave birth to the Rione Monti and Aia Piccola.

Born from the farmers' need to provide themselves with a deposit for agricultural tools and a simple shelter, over time the trullo has become a more complex system in which the stable residence has also been obtained.

Mutation of the concept that, organized along the routes in a planned form, attests to the gradual transition from a spontaneous consciousness[2] to a critical consciousness[3].

In the initial phases the trullo is configured as an existenz minimum for a peasant house, that is, as an elementary housing model that tends to aggregate around a common court, recalling the strong community ties of the vicinato.

The trullo construction consists of a central space of approximately square shape covered by a pseudo-dome on the inside and a conical roof on the outside.

The evolutionary process of the type has made it possible to highlight an increase in the central compartment, generator module of the trullo, determined by the expansion on all four sides with the addition of other smaller elements only when the building unit has a housing function.

In this case, the central space performs the functions of living room and dining room, while the side spaces facing the central one are used for night rest, in the case of alcoves, or for heating the environment, in the case of focarili. In Another significant element of the trullo construction is the nicchia. Built inside the hickness of the walls, the "nicchia"

as recess) made up for the absence of furniture for storage, also because of the limited space available, creating real pantries and, therefore, making the interiors of the housing units more comfortable.

The roof made by the irregular overlapping of thin slabs without edge finishing presents a curvilinear trend of the cone generators that incorporates the main and secondary rooms.

The latter are generally covered by flounces or saddles connected to the main cone through fittings that act as eaves lines.

Classification of building types

It should be pointed out that for the purposes of reading and therefore for the typological classification of the trullo, it was fundamental to use a methodology based on the analysis of the constituent elements, both of the building organism and of the aggregative one, which led - the latter - to recognize the combination of the elementary units in order to understand and return the patterns of each typological variation.

This operation of ordering the type has made it possible to identify the formal-structural differences between the building units, with attached diachronic and synchronic variations, and the way in which they are inseparably connected to each other. The decisive elements for the classification of the building types, without which an exact configuration of the trullo housing unit would not be defined, are: the central space (basic module), the focarile, the alcove and the added cell.

The nicchia in the walls, although they help to define the morphology of the trullo's supporting structure, are not considered relevant for classification purposes.

The position of the access, instead, can introduce significant changes in the typology, even if of secondary character, depending on whether it is placed on the axis or lateral to the central space. In the first case, in fact, the entrance door is generally positioned between two small side niches, while in the second it is placed next to a single side space that very often coincides with the focarile. A first classification criterion used is the dimensioning of the elementary cell.

In fact, three dimensional ranges have been identified, which provide for a first subdivision of the building units according to whether the central space is a "subcell", a "cell" or an "increased cell", respectively with a size between 5/8sqm, 9/15sqm and larger than 16sqm.

A second criterion applied to the reading of trullo constructions concerns the position of the focarile and its size.

This constituent element may be located in a specialized compartment or within the central space and may be a quarter or half the size of the elementary cell. In some cases, the size of the elementary cell is doubled by the addition of a compartment of the same size.

The central space with focal point may be characterized by the presence of one or two alcoves or one or more added cells.

In some cases the housing unit may take on a more complex configuration through the presence of one alcove and one added cell or a number n of alcoves and added cells.

The extensive survey of historical buildings has made it possible to compare and classify the various types of buildings, which has led to the identification of four major typological categories of housing: the elementary cell with focarile, the elementary cell with focarile and alcove, the elementary cell with focarile and added cell and the elementary cell with focarile, alcove and added cell.

This study has made it possible to arrive at a classifying order of the typologies referable to the artefacts present in the ancient centre.

Once the basic module has been identified, as the main constituent compartment of the living cell, the first classified building typology is that constituted by the elementary cell and the focarile placed or not in a specialized compartment. The same category includes the building typology characterized not only by the presence of the focarile but also by the doubling of the central compartment. The building typology, instead, is

number equal to one or two.

In some cases, the alcove, i.e. the room generally used for sleeping at night, gives way to a larger room that takes the name of added cell. This is the case of the typology characterized, therefore, by the central compartment with focal point and by a variable number from one to three of added cells.

The plan of the trullo buildings is complexified in the case of the typology constituted by the elementary cell, the focarile and by a variable number of alcove and added cells.

Conclusions

At this point of the research carried out on the type of trullo, the question arises of how one can think of its protection and, at the same time, of its survival as a residence capable of satisfying today's housing needs. We have, in fact, highlighted that the organisms made in Alberobello between the 16th-17th and 19th centuries reach living areas decidedly below standard with respect to the real functional needs and to the specialization of contemporary domestic spaces. So, how can we imagine updating them, even in the hypothesis of preserving the characteristics that made the type, in the aggregate version to form the settlement, an interesting case worldwide?

It is undoubtedly possible to imagine that the increase in the residential area can be sought, for example, by reconstructing the diachronic mutations that have occurred over time which, upon a critical evaluation based on the data acquired, can be considered congruent with the expectations of the building type.

We believe, for this purpose, that the study proposed here, with which we have tried to build a substrate of convenient knowledge, can constitute a useful scientific reference to suggest proportionate intervention proposals, related to the essential connotative ingredients of the type.

Figure 1. Detected areas, eidotypes and road fronts, Thesis Laboratory/Final Workshop, Politecnico di Bari, 2020.

ISUFitaly_2020 **URBAN SUBSTRATA** | Morphological legacies
& | and
CITY REGENERATION | design tools

Figure 2. Trullo example, Thesis Laboratory/Final Workshop, Dicar, Politecnico di Bari, 2020.

I TYPOLOGICAL CLASSIFICATION CRITERION:

Elementary **cell surface size**

• **SUBCELL**
5/8 mq

• **CELL**
9/15 mq

• **INCREASED CELL**
> 16 mq
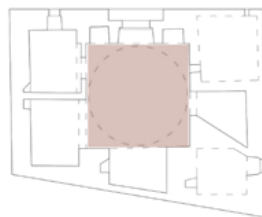
II TYPOLOGICAL CLASSIFICATION CRITERION:

Position of the **focarile**

• in a specialized compartment
• within the central space
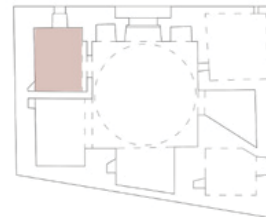
Figure 3. Typological classification criteria, Thesis Laboratory/Final Workshop, Dicar, Politecnico di Bari, 2020.

Figure 4. Synoptic panel subcel, Thesis Laboratory/Final Workshop, Dicar, Politecnico di Bari, 2020.

Footnotes

[1] *Trùllo*, s. m. 'Round shaped stone house and conical roof, typical of the Salento peninsula'

[2] *Consciousness,* 'immediate ability to sense, understand, evaluate the facts that occur in the sphere of individual experience or lie ahead in a more or less near future'.

Caption

Fig.1 - Detected areas, eidotypes and road fronts, Thesis Laboratory/Final Workshop, Politecnico di Bari, 2020.
Fig.2 - Trullo example, Thesis Laboratory/Final Worksho, Dicar, Politecnico di Bari, 2020.
Fig.3 - Typological classification criteria, Thesis Laboratory/Final Workshop, Dicar, Politecnico di Bari, 2020.
Fig.4 - Synoptic panel subcel, Thesis Laboratory/Final Workshop, Dicar, Politecnico di Bari, 2020.

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Gravina in Puglia: City substratum as a Process of "Invention" and Transformation of the Territory

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Abstract

The city of Gravina in Puglia owes its name to its peculiar geomorphological position, presenting itself as the city of the "Gravina and the Caves in the Gravina" (città della "Gravina e delle Grotte nella Gravina")[1]. The locus-urbs Gravinae is witness of the passing of time, in an incessant succession of civilizations since the ancient Paleolithic, although the sure sources date back to the Neolithic, around 5950 B.C. In its territory, where nature and the work of man represent an inseparable binomial, the caves and the ravines of the "grande baratro" (Botromagno) have been modeled for the needs of everyday life, giving life to the rock habitat. The cave was occupied by man and made refuge, dwelling, place of worship or burial. Prehistoric dwelling then resumed in medieval age, in an era pervaded by uncertainty and vandal invasions in which man felt the need to re-find a safe place, the old abandoned dwelling. History arises as a continuous transformative process in which man, changing his needs and habits, transforms his native place, making it more "anthropic" and less "natural". The aim of the research is to propose a historical procedural study of the evolution of the gravinese rock habitat and of the same civitas, from the primitive caves to the cave-houses (domus criptae). Parallel to this progressive typological evolution, it is noted that the tuff from a simple natural casing becomes a building material used for the weaving of wall perimeter, the basic element for the following palatiate houses.

History of the city of Gravina in Puglia

Gravina in Puglia is an Apulian municipality in the province of Bari with an average altitude of 338 meters and a maximum of 672 is located 51 km south-east of Bari and 76 km north-east of Taranto.

The city of Gravina in Puglia owes its name to its peculiar geomorphological position, born next to a natural gully named Gravina, in which flows the Canapro torrent, usually called Gravina itself. The word *Gravina* means ravine, gully, and represents a great example of "erosion valley" in the Apulian-Lucanian Murge, carved by the force of water. The good geographical location, the richness of the territory and the availability of water have favored the presence of man since the ancient Paleolithic, even if the sure sources date back to Neolithic, around 5950 b.C.

The primitive man used to find shelter in the natural caves of the Gravina gully, starting a relationship with nature that will change and grow up over years, according to the evolution of man's habit. The only man's aim at this moment is to survive, and the appearance of its shelter isn't an important aspect. During the Iron Age, VIII-III century a.C., the men of the caves began to climb the west bank of the ravine reaching the hill of *Petramagna* (big stone) or *Botromagno*[2] (big gully), inside the *Peucetia* territory, a strategic place thanks to the fertility of the soil and the presence of water. Probably during this period, two little villages are born along two territorial depression of the east side of the gully. During the Greek period, VI-V century a.C., the village of *Peuceti* along the *Petramagna* hill was reached by the Greek civilization, giving life to the city of *Sidion* or *Sides*, that will become an important pole for commercial exchanges between West and East thanks to the *Via dei Mercanti,* the linking road between Ofanto valley and Metaponto. The *Petramagna* civilization started building roads and structures made of stone, defining a gap between the upper civilization, with built architecture, and the lower one still linked to the caves. In this period the city walls were built too. At the end of the IV century a.C. the Romans invaded the *Peucetia* and occupied *Sidion*, changing its name into *Silvium,* turning the city into an important roman station along the Via Appia, linking Roma with Brindisi. Romans built more roads to increment commercial exchanges. The Via Traiana, joining Silvium with Benevento and Taranto, made useless the *Via dei Mercanti*, so different roman outposts were built along the east area of the gully, like the two ancient villages along the depression of the gully that became Pagus and Vicus. During the Roman dominion, local farmers received an area to grow, scattered throughout the territory, creating the large estate (*latifondo*) and weakening the power of the urban center. After a period of greatness, from the I century a.C. began a phase of decline until the complete abandonment of the city. In 456 it was invaded and destroyed by vandals of Genserico, forcing the survivors to find refuge in the caves and into the two small districts Pagus and Vicus, called Piaggio and Fondovico later. Under Byzantine rule, the population of the destroyed Silvium experienced a period of peace until 553. From 313 d.C. Christianity became the state religion and Gravina became the seat of two monastic orders: Benedictines and Basilians, who kept worship in some rock churches. In a melting pot of different cultures, the cave inhabitants learned from Byzantines and Basilians, who taught how to design and decorate caves. A new knowledge started to grow inside the consciousness of the autochthonous: they come back to the cave knowing the idea of the house, religious building, meeting place and how to build them with the local material, the granular tuff. They began to dig the tuff, giving shape to the stone to meet their changing needs. New houses and new buildings were built along the area, going along with its morphology, in a constant combination of nature and man's work. A new civilization was born, the *Rupestrian* one. This rupestrian settlement was the "*a parete*" type, created digging the wall of the ravine. Many were the churches-caves: San Basilio, Santa Maria della Neve, Santa Maria del Chiancone and the rupestrian church Sant'Andrea. After a fight between Saracen and Longobard, the church of San Giovanni in Fondovito (Fondovico) was built in stone brick.

In 1069, the town became a fief of the Normans, who made it a county. The Normans built solid walls around Pagus and Vicus, between which was built the castle, later converted into the main cathedral. Inside Piaggio lived together poor and rich people,
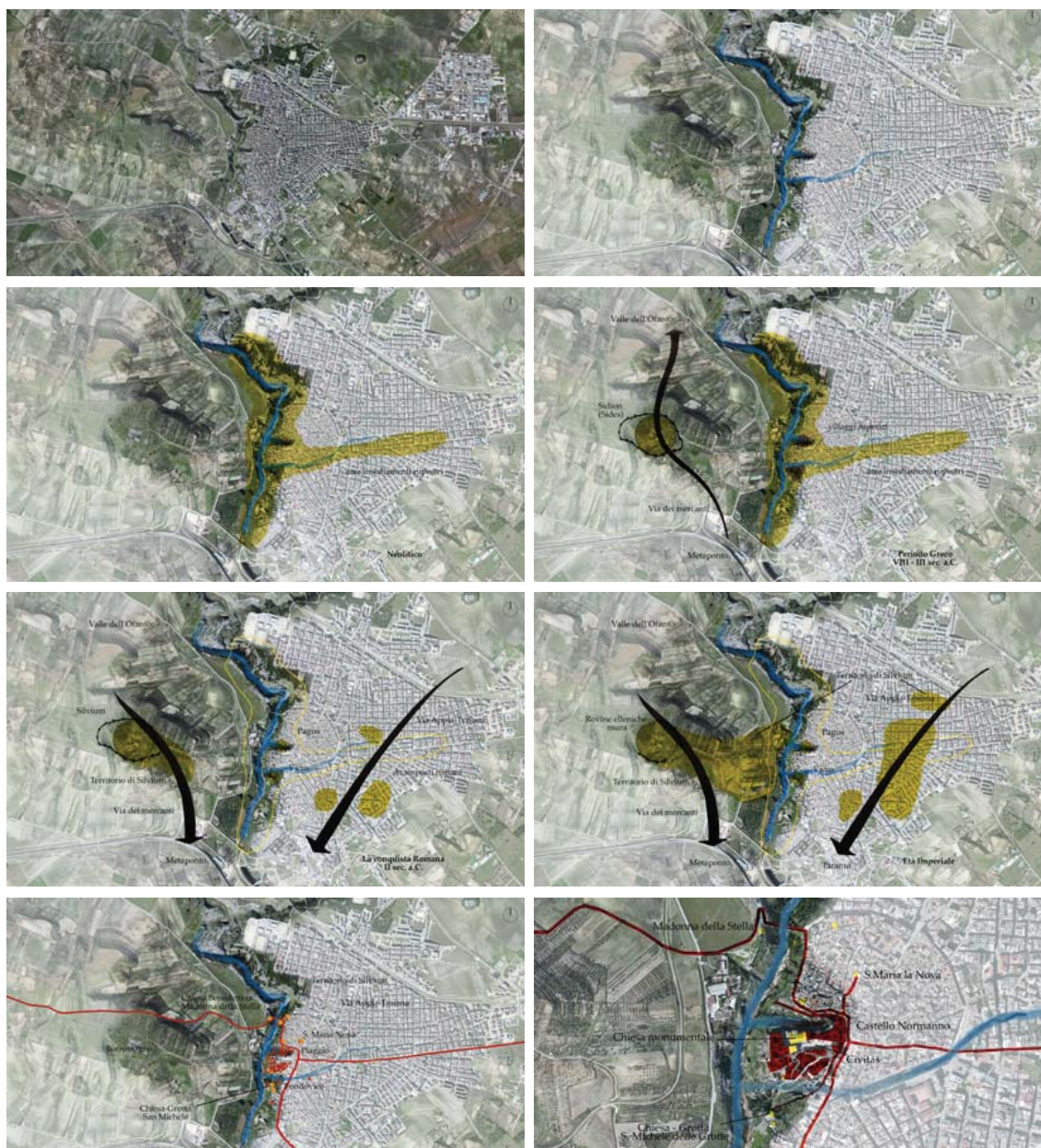
Figure 1. Historical phases. With the conques of Rome, the entire territory became an important center for trade on the Appian Way with the name of Silvium. In 456 the city was destroyed by the vandals of Genserico and the inhabitants took refuge in the caves of the river Gravina, giving rise to a new rock civilization. Already in the Early Middle Ages in the district there were rock churches where the ancient Christian cult was practiced. Before the year 1000, both the Basilian monastics and the Benedictines began to establish churches and abbeys. In 1092, a castle and a monumental church were built above the district. Walls and some entrances or doors were built. Many people from northern Italy arrived in the city following the court of Unfrido who settled on the plateau where they built houses and churches. This phenomenon caused the abandonment of many notable Gravinese families resident at Piaggio to settle on the plateau. Before XVI the district continued to grow and the use of caves left the way to buildings built with the material extracted from the subsoil. After 1500 the neighborhood began to lose its importance and its "pulsating" role for the city. In 1865 the city expands towards the Murattian districts, the walls disappear and new buildings were born near the old town. The Piaggio undergoes a progressive "peripherization". The exodus from the old town and the Piaggio district reached its peak between 1970-1980, with the construction of the P.E.E.P. district to the northeast of the town.

inside the caves or inside new little buildings, with gardens and vegetable gardens. The area next to the castle between the two ravines was called Civitas, the new urban center in which started to be built new palaces, the seat of political, administrative and religious power. In 1223 with the Swabian domination under Federico II of Swabia a new castle was built outside the perimeter of the old historical center. The two old districts, Piaggio and Fondovico continued to grow with a commision between caves and built houses. During the Angioin domination, Gravina shows itself as an important economic center, with the peasant that becomes a farmer. In 1380 Gravina became a fief of the Orsini family, that built several important buildings such as the Purgatorio church, the monastery of the Dominicans, Finya library, Orsini Palace, and in 1743 the aqueduct connecting the two sides of the ravine. In 1456 a violent earthquake destroyed many monuments, including the cathedral rebuilt by Orsini family. In 1807 with the abolition of feudalism the last duke of Gravina lost the feudal rights and the local economy was guided by the "*masserie*" (typical building in South Italy, a large farm related to land ownership). After the passage of the 1865[3] Expropriation Act, Gravina got a Road Regulation and Expansion Plan. The new urban planning instrument for the regulation of the building activity defined the new design of the city, destroying the old city walls, building new buildings and the "villa", the street piazza, obtained by the closure of the old moat *extra moenia.* The old city started to lose importance and inhabitants, who, driven by the myth of the "new", decided to left the historical center, in particular the two district Piaggio and Fondovico. The old center, the earth of the city, become the suburb of the new city. The final abandonment of the old city took place between 1970 and 1980, with the construction of the P.E.E.P. district in the north-east of the city. Since the 70s several plans have been drawn up for the recovery and reorganization of the city, but none has been approved except in part, with many negative consequences: an uncontrolled urban expansion devoid of the necessary infrastructure, buildings of poor architectural quality, the abandonment and degradation of the historic center.

Studying the dynamics of the urban phenomenon from the ancient period to the contemporary one can define the causes that have determined the current decadence, in particular of the ancient city, with the aim of a civil, cultural and architectural ethical rebirth of the city.

The evolution of the building as a reflection of the social evolution

The use of natural caves as shelter isn't linked to the medieval period, but it's born since the prehistoric and protohistoric era. The cave-shelter is the starting point for the development and growth of civilization, in particular the rupestrian one, who saw in the cave the basic cell of the rupestrian village itself. The village growth along the gully, inside the cavities and the little fiddly bits around, defining a concrete relationship between man and nature. When in 456 a.c. the area of Gravina was taken by vandals, the cave was again the ideal place in which find refuge, hidden from any danger. In a melting pot of different cultures, Armeni, Greek, Slavi, the civilization was spiritually guided by Basilians and Benedictines, who saw their hermitage in the caves. The great Byzantium influenced, therefore, also the "*Grande Baratro*" (the great chasm), so the bare walls of the caves were decorated of many different colors, fantasies, proposing different typologies of the plan of the new churches. The Greek cult coming from Byzantium was progressively replaced by the Christian one of the Benedictines, who introduced a new spiritual idea based on the concept "*ora et labora*", literally pray and work —the motto of the Benedictine order. The stone table was excavated to obtain niches, altars, pillars that defined the structure with 3 or 5 naves, as we can see into San Michele delle Grotte church or Santa Maria degli Angeli church. Probably in the territory of Gravina in Puglia there are forty churches-caves, many of which are unknown and in total abandonment. The church-cave was the core of the collective and spiritual life of rock civilization, instead, the cave-house was the place in which the community lived for generations, a place that started to change its shape according to the new necessities. The tuff, malleable material, was excavated to obtain new small rooms. The base cell was a room generally square, with the minimum dimensions to live, with a little space in which to take care of

Figure 2. The evolution of the cave. From natural shelter to cave-house, excavated to obtain more functional spaces.
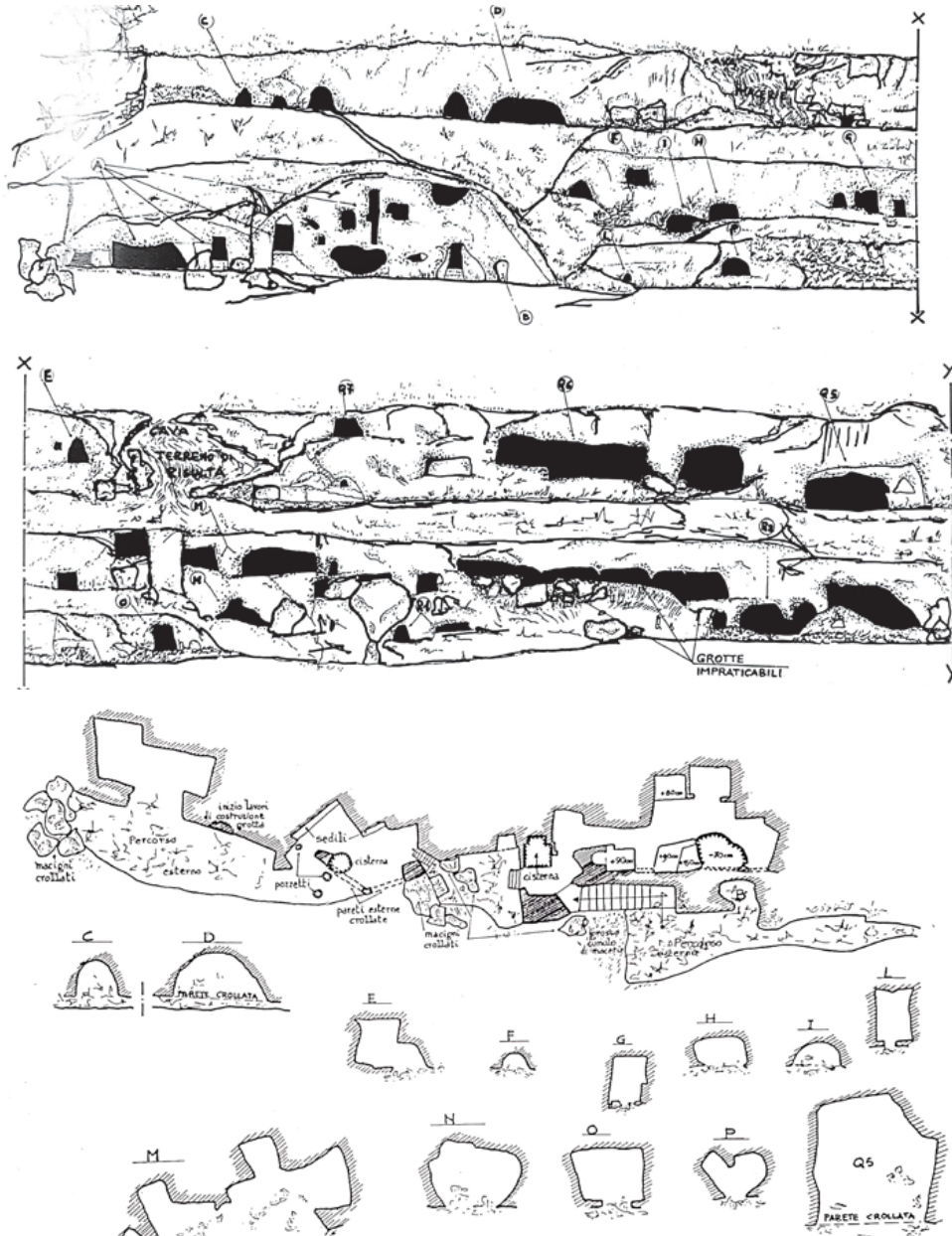Source: Capuzzi, L., (1981), *Gravina Un Paese del Sud - Quaderni di Urbanistica n.1,* Pubblicità&Stampa, Bari.

Figure 3. "The Seven rooms complex". Prospect and planimetry.
Source: AA.VV. (1989), *Gravina in Puglia. Alla ricerca del passato*, Liantonio editrice s. n. c., Palo del Colle, Bari.

the animals. The principal door was the only source of light, while the air exchange was obtained from small vents. Sometimes the cave-houses were built on different levels, linked together by a trapdoor. The ground floor for animals, while the upper one for the family. Usually, for the collection of water, a cistern was obtained on the ground floor, where rainwater flowed. On the south-west side of the ravine there is a striking example of this reality: the "Complex of the seven chambers"[4]. It represents a clear example of Rupestrian Architecture carved into the rock. According to the morphology of the ravine, this type of house was built on several levels, the lower one usually used as a stable or storage while the upper one housed stove and beds. Having more layers the roofs of the lower cave-house were the street for the upper one, usually called "*strada-vicinato*"[5] (street-neighborhood) in which the inhabitants lived together. The "neighborhood" represented the first elementary nucleus of the rock community.

Rione Fondovico and Piaggio: the founding districts of the city

The re-appropriation of the spaces around the ravine, begun in the fifth century with the rock habitat, continues with the construction of the first houses in masonry in the districts Piaggio and Fondovico, between IX and X century a.C. The names Fondovico and Piaggio derive from the Latin *vicus* and *pagus*, namely "little village/district", but it's possible that the name of the district of Fondovico it's linked to the presence of San Vito church from which the name of Fondovito instead of Fondovico. About the Piaggio district it could also mean *plagius*, namely "copy" of the other district Fondo-Vico/Vito.

During this particular period, the primitive man gives ways to the peasant, the cave house to the typological building of the house itself called "casedda"or "casa terranea"[6], built at the begin of the IX century, the different name of this kind of building is probably linked to the area in which is built, the casedda outside the property of the village, while the casa terranea was generally built inside the village. the small houses were built following the course of the curves, as extension of the caves or as isolated buildings. The material used was the tuff, obtained from the quarries near the village. In other cases it was possible to dig directly on site, obtaining the material necessary to build the raised and at the same time obtaining an underground environment, the cellars. Tha casedda was the first dwelling of the peasant, 25 mq built in stone, with a flat roof of mud, reeds and straw and a little window in front of the principal facade. The basic type with just the ground floor in which lived all the family usually with animals. The dispositions of the house, inside the Piaggio, follows the morphology of the contour line in a lower level than the upper one of the *Civitas*, the upper area in front of the cathedral. The street, just like for the Chamber of seven rooms, was the place of the community, of social relations and the place for artisanal work. During the Angioin domination Gravina shows itself as an important economic center. From 1456 started a period full of restorations of old buildings with the construction of new buildings. With the changed face of Gravina, begun to change the habits and needs of the community and, as consequences, the way they used to live. The peasant becomes farmer, the basic type "casedda"undergoes a variation becoming "lamione". From a single house started, little by little, the development of the aggregation of more single units. The lamione was born from the refusion of two basic types, to get more functional space, distinguished between the one for the man and the one for the animals, with a dimension between 4/6 m for 10 m. The transformation of the basic type, its evolution shows the evolution of the civilization itself, with a gap between the poorer class and the richest one. Trying to reach "ideally" the upper level of the Civitas, the piazza of the upper level, the richest class started to build the second floor above the lamione, getting the "*soprano*" typology: the ground floor was called "*sottano*" and was for the poorer one with vaulted spaces, while the new level, the *soprano*, for the middle class. It had usually 2 or 3 rooms for each floor, with the staircase along one side of the house.

Lost opportunity

The two districts, Piaggio and Fondovico, ancients hearts of the old Gravina, are now the forgotten parties of the city. During the Aragonese period were built many ducal
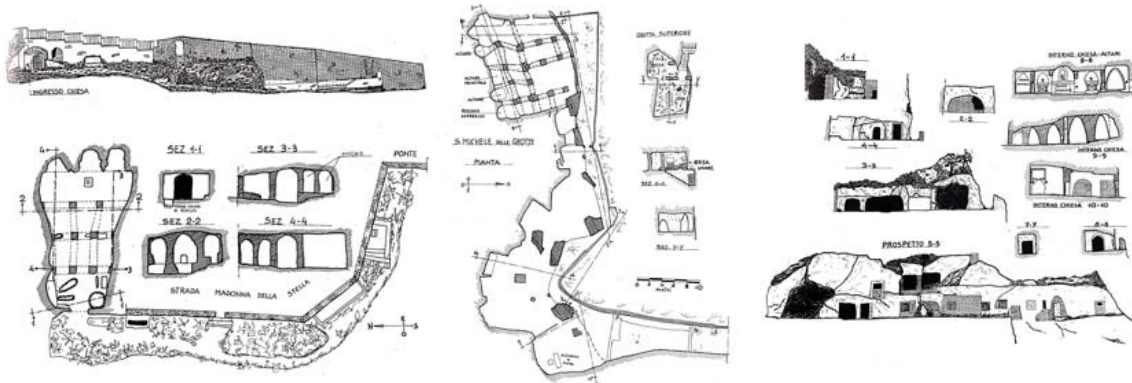
Figure 4. S. Maria degli Angeli church-cave (left); San Michele delle Grotte church-cave (right).
Source: AA.VV. (1989), *Gravina in Puglia. Alla ricerca del passato*, Liantonio editrice s. n. c., Palo del Colle, Bari.

Figure 5. S. Lucia church derives from the "casedda" basic type. The specialised builiding has the same planimetry and facade of the basic type with bigger dimensions.
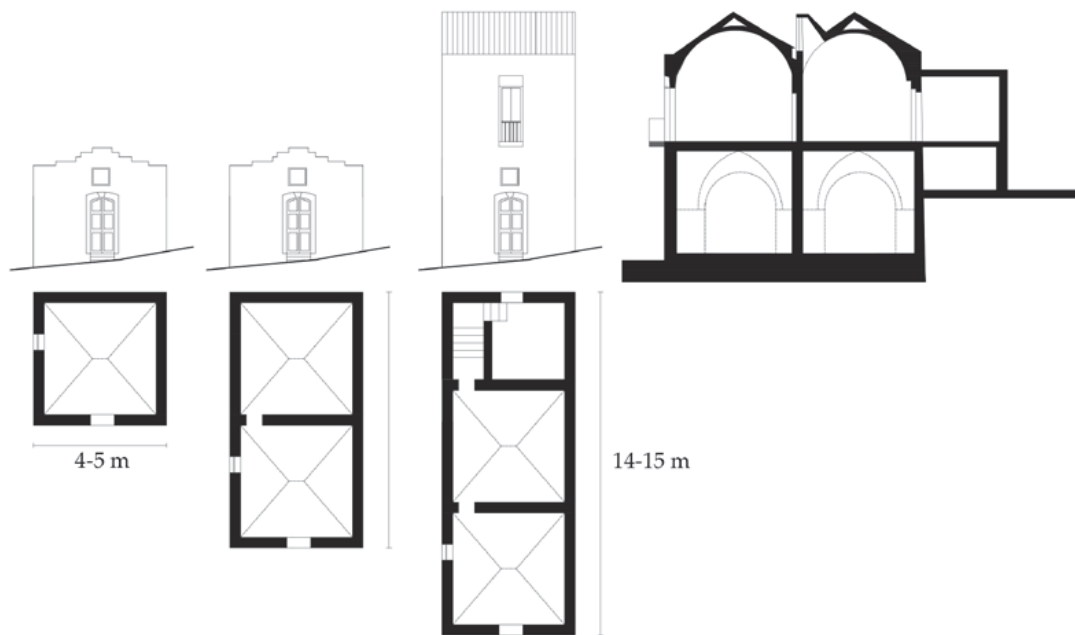
Figure 6. Hipothesis of the typological evolution of basic residential type. From left "casa terranea-casedda", "lamione", "soprana".

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palaces (Amati, Calderoni, Sottile Meninni) on the upper area, making the two districts less important. The collectivity of the neighborhood left the districts, where there were only widows, laborers, peasants. The life inside the districts saw hard, without running water, sewers, necessities. As a result, little by little, the place was definitively abandoned, condemning it to a certain end. Only recently, since 2015, the Fondovico district has been the subject of a recovery plan, which has allowed to redevelop the area with good results. Unlike the district Piaggio which is in disarming condition. Many buildings have collapsed, nature has taken over. It is impossible to find the old little piazzas with the fountains, the ancients vegetable gardens. The district shows itself as a cemetery of skeletal structures, the memory of a long past. Fortunately, competitions have recently been launched for the redevelopment of the area, with the possibility of restoring the gardens, designing a park and securing what remains of the buildings that were the cradle of the Gravinese civilization.

The project is strictly linked to the typological-historical analysis, which defines an idea of the dynamics of the evolution of the districts. Knowing the past is possible to understand how to save and improve the old site. The first step is the drafting of a typological card of the dwellings and any special buildings within the area. In the Piaggio, in particular, there are several basic types houses, "*palazzotti*" (palaces) deriving from the refusion of basic types, some churches and private gardens of the clergy. Many buildings are abandoned, covered by vegetation, many others have collapsed. The area must be reclassified by eliminating debris, infestation, waste materials. This must be followed by the safety of unsafe buildings with the restoration of some facades, including where possible new functions. Clean the area, securing includes propping operations, restoring collapsed buildings where possible. The gardens can be used as a public park, with local plants, vegetable gardens, essences. Few operations capable of giving a start to a long process of urban redevelopment of the ancient heart of the city.

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Figure 7. Photos of today's condition of Piaggio district (photographer F. Bonerba).

casa terranea
con sopraelevazioni

casa terranea

casa grotta

non classificabile

rudere

chiesa

edificio rinascimentale
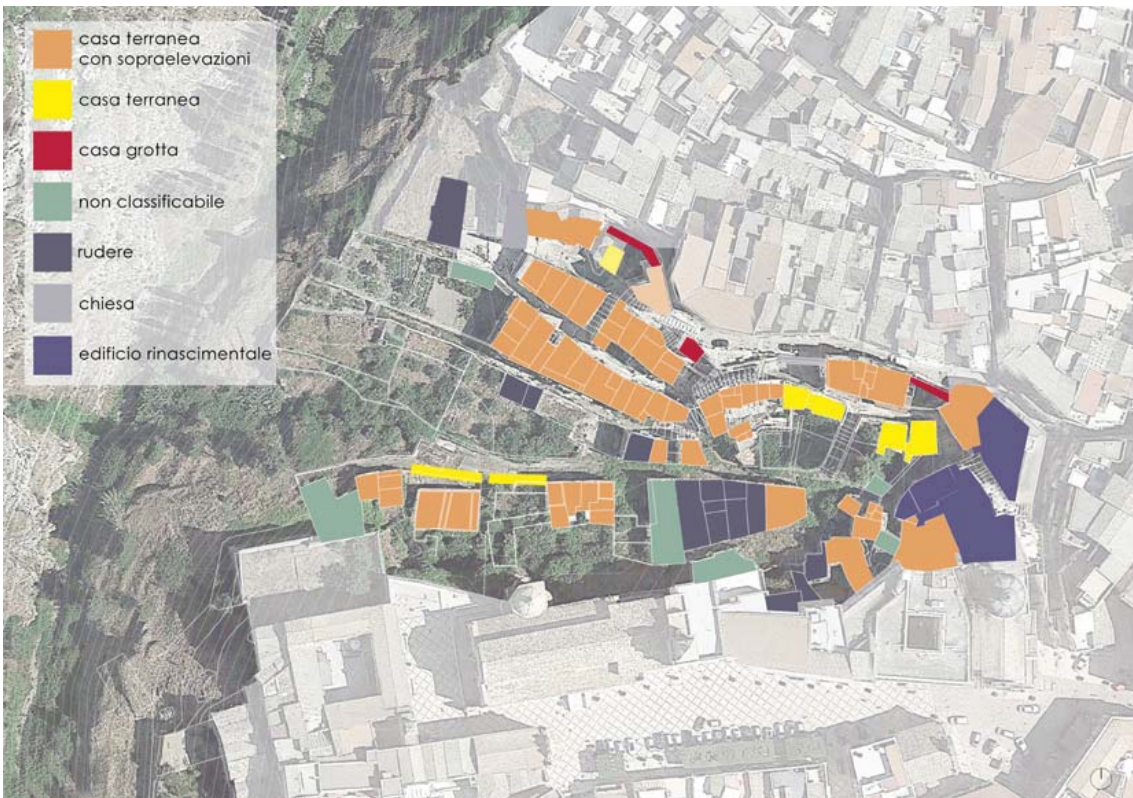
Figure 8. Typological card of basic and special buildings inside Piaggio district.

Footnotes

[1,2] Raguso, F., D'Agostino, M., (1999) *Gravina, San Basilio Magno al Piaggio, Habitat ruprestre, Chiesa-Beneficio,* in Quaderno n°1 Gravine e Murge (Tip. Tragni, Altamura);

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Borgo of Chiaravalle Milanese: project tools and strategies for the recovery and protection of the historical center

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Keywords: *urban regeneration, analysis, urban form*

Abstract

The southern area of the city of Milan is characterized by a strong agricultural connotationwhich is shown by architectural and natural episodes cut off from each other, practically devoid of their own meaning and not related to the environment they belong to. Chiaravalle Milanese is a clear example: a medieval town developed around a Cistercian Abbey and its farmstead, crossed by historical irrigation canals or special hydraulic elements such as dams or mills, that give evidence of the local agricultural culture. Nowaday, this landscape presents itself as being separated by disused railway tracks, characterized by inefficient services and a want of public areas for the community, marked by a shortage of green spaces, commercial activities and cycle tracks or pathways, as well as being cut off from the rest of Milan areas and suffering from a considerable urban decline. From the reading of the characteristics of the area, a cross-sectoral analysis has been carried out to define objectives and strategies, such as the enhancement of the agricultural culture through the promotion of a short-chain production in which the farmstead Grangia may regain its central role; the recovery of the main square historical identity has been planned thanks to the introduction of shops and the offer of educational and nature walks. This project is meant to actualize the productive experiences of the past, in relation to analysis which takes into account the economic and environmental scenario, as well as the social and cultural background of the town.

Introduction

Landscape of the southern part of the city of Milan is characterized by lots of rural complexes that represented the center of organization for the past agricultural life.

The current situation is about a local identity no more readable in the architectural forms.

In fact, only some isolated symbols of ancient villages remain, totally disconnected from the present urban context and difficult to identify.

These historical signs of built territory are often left to total abandonment, because of the loss of their function. The protection constraint, on the other hand, represents a problem for some speculative practices, as the state of decay of the building sometimes becomes instrumental to demolition and to the use of the ground for new constructions[1]. Finally, the buildings may have gone through significant transformations and alterations that have compromised their recognizability.

History and territorial context, management and future projections have been essential tools to make a detailed analysis that could make up an efficient support for the planning strategies suggested.

Framework
Reading territorial morphology

The first phase of analysis has been affected by the deepening of territorial, urbanistic and landscape features at different scales, starting from a framework extended to the metropolitan city to arrive at the relation with the town of Chiaravalle.

The city of Milan arises from the aggregation of several urban units that coexist in the center of a prolific plain, rich in waterways and canals. The geographical position, center of gravity compared to the other cities of the plain, the know-how of techniques, linked to the characteristic production of the entire region, have worked for the development both in agriculture, manufacturing and industrial sectors. The signs of this evolution, result of the perfect synergy between built and territory, represent essential elements, memories of a past that cannot be lost.

Through an interpretative reading of historical maps (Crivellari, 1906), the ancient farmsteads all around Milan have been identified and examined in their distribution on the territory and in their evolution. (Fig. 1) The investigation has allowed the spatial identification of various urban units, each one provided with specific identity characteristics and its own peculiar denomination[2], as well as their historical expansion phases. The emerged scenery, supported by studies on the hydrography and the green system (Fig. 2)[3], is the confirmation of the historically agricultural vocation of the southern territory of Milan, still more evident compared to that one of the northern area[4]. The urban expansion of the southern part, in fact, has affected only main centres[5], grown around the road infrastructures independently from the preexisting fabric. This process has almost entirely spared the agricultural areas, improving the creation of locations completely detached from the context of Milan.

A peculiar example of this urban process is the extra-urban fraction of Chiaravalle Milanese. Settled just nine kilometers south-east of the heart of Milan, the town remained independent from an administrative point of view until 1923, before being annexed[6] to the city of Milan.

Currently inserted within the South Milan Agricultural Park together with other sixty towns, Chiaravalle manages to maintain its own identity, founded around the famous abbey of the Cistercian monks of Saint Bernard, although reduced to a little district.

The link between the monastic order and the urban center was based on different aspects. The city markets played an important role for the commercialization of farmsteads and abbey's production[7], while the flourishing agriculture could be considered the result of an extraordinary and innovative Cistercians hydraulic engineering technique. Thanks to the creation of canals and springs, the marshy lands were healed permitting the cultivation of fields; the excess of water, which caused the swamping, was redistributed in the water meadow, "donkey spine meadows, furrowed by little canals properly inclined to allow the continuous flow of a veil of water. The system had irrigational and,

at the same time, thermal functions: in fact, being relatively warm in winter (around five degrees), water allowed the germination and the development of vegetation also during the cold season" (Forni and Pisani, 1968).

Chiaravalle's landscape is still characterized by the water, whose main course is that of Vettabbia's, from which canals, moats and minor springs move and irrigate fields, thus becoming the driving force for cereals' grinding in the mills. It is a unique productive system but its value has been gradually ignored until total disintegration and abandonment.

Analysis and research methods

The analysis sectors have concerned historical features, physical-environmental characteristics, state of use, legal status, demographic and socio-economic traits. The morphological analysis has treated the methods of development of the town over time, in relation to several natural or anthropic factors that have influenced it.

- Persistences and historical development

Historical development analysis has focused on the relief of presence, evolution or removal of signs in the territory (waterways, paths, infrastructures, settlements and single buildings). The historical phases have been investigated on a large scale, using the ancient urban maps[8]. In this way, it has been deduced that first housing units were centered around the Cistercian organism (abbey - farmstead- mill system), interrupted by subsequent interventions due to the improvement of the road network.

- Landscape system

Landscape analysis has concerned natural, agricultural and urban landscape in order that the project could safeguard and enhance every elements, adding landscape quality to the place that it aims to transform. The panoramas that still preserve their unique characteristics can be identified along Saint Arialdo's street, which brushes the Vettabbia Park and the abbey, and Saint Bernardo's street, which crosses the historical center. - Vettabbia Park

Vettabbia Park, which takes its name from the main canal that crosses it, is included in South Milan Agricultural Park[9]. This one has the aim of landscape and environmental conservation, eco-geological equilibrium in the metropolitan area, preservation of farming activities and connection between urban and extra-urban green areas, in favour of citizens leisure. Areas lapped by Vettabbia, recently been the subject of a valorization project (Prusicki and Simonetti, 2009), represent a theme public park related to the restoration of the ancient waterways flowing through the southern part of Milan, in order to interact with Chiaravalle abbey. However, various issues about accessibility and connections with the abbey remained unresolved, because the only entrances are located in via San Dionigi or close to Cascina Nosedo, quite far from the monastic complex; and there are also areas closed to the public.

- Permanency of historical crops

Studying Teresian Land Registry (1722), it has been possible to identify those crops once placed in monks property fields. Lands outside the abbey were planted with grass and vegetable gardens, mainly in the green areas that surrounded the farmstead. Northern portions outside the abbey were instead cultivated with vineyards. According to the Agricultural Sector Plans[10], fields around the abbey and the farmstead are currently cultivated with corn and set-aside, vineyards have been replaced by residential buildings; while eastward there are autumn-winter cereal crops, westward there are stable meadows and pastures.

- Analysis of the urban settlement system

Analyses on the state of use have examined streets, squares, gardens, open spaces, buildings and artifacts. Special attention has been paid to intended uses, taking into consideration buildings in a state of decay and neglect, and those still waiting for a new function. These studies have allowed to understand the true nature of the town, mainly consisting of residential private buildings, denoting the lack of buildings with specific functions. In this regard, if on one side for the education sector there is only one school structure[11], on the other the health sector, lacking in hospital facilities, refers to the

adjacent San Donato. Instead, there are many cultural centers that deal with volunteer programs and community services, such as Casa Chiaravalle[12] and Circolo Arci Pessina[13].

Regarding the urban roads system, via San Bernardo is the main street subjected to high flowing traffic without sidewalks and bicycle paths. Parking lots occupy main squares and they are also rather limited. In addition, connections with the center of Milan are nonlinear and need waiting time of thirty or sixty minutes, not covering all the time-slots. The inefficiency of mobility system seems to be seriously penalizing for an area with such a high cultural and architectural heritage level, and it represents a significant obstacle against the tourism as a possible resource for the development of the town. For this reason, a thoughtful mobility design could give back citizens spaces of aggregation and public green areas, today saturated.

- Legal analyses: binding regime

Checking the restrictions[14] present on the territory of Chiaravalle, it has been found that the abbey is subject to direct protection, while its properties are subject to an indirect one. The Grangia farmstead is also under a direct protection and it is owned by the municipality; this makes inadmissible the state of decay of the building, which is today partially collapsed (roof and parts of walls), with the presence of spontaneous vegetation inside the masonry.

Reading the current features: strengths and weaknesses[15]

From the direct observation of the territory, potential and criticisms have been detected in relation to landmarks on the area: the complex of Chiaravalle abbey and its mill, the Grangia farmstead, landscape elements, disused rail tracks and public spaces. (Fig. 3)

Chiaravalle abbey, even representing a touristic attraction inside a purely residential town, has several limitations about fruition schedule for visitors and suffers from the difficulty to reach it from the center of Milan. Some critical issues are related to service deficiencies and to inadequate paths around the abbey, thus not encouraging the visit of the whole city and the Agricultural Park. The presence of the monastic complex could represent an economic resource for the town if the zero-kilometer production system of monastic tradition is recovered.

The mill outbuilding of the abbey, made safe, restored and opened to the public since 2009, has become an evidence of an ancient way of living, showing the multiplicity of functions performed in each room and technics evolution over the centuries[16]. Today, however, the mill is available only on the occasion of scheduled events, such as conferences, with limited opening hours confined to the weekend.

The Grangia farmstead, the architectural and organizational structure that once answered the task of producing income, is currently in a state of serious decay with evident security problems related to the risk of collapse.

Landscape elements such as waterways, irrigation channels and water meadows are in a state of degradation due to improper use and neglect, instead of being preserved and enhanced for their singularity. Moreover, Vettabbia Park remains a stand-alone system which doesn't communicate either with abbey or the ancient village.

The disused rail tracks of Chiaravalle constitute an interruption of urban space between the ancient town and the abbey. Disused since 1998 because of the construction of the new railway line Milano-Pavia, the ancient rail tracks, just over three kilometers long, run along the Chiaravalle abbey and go into Agricultural Park fields. The old rail line, which caused static problems to Chiaravalle abbey (Jurina, 2015), even though it is has been longtime object of reflection for some recovery intentions, is currently dangerous and in a state of instability, covered by spontaneous vegetation.

Pedestrian and cycling paths are discontinued, and they are therefore inefficient. Parking areas are located without any rational logic; indeed, public spaces, deficient in terms of commercial establishments, are often improperly occupied by cars, and green areas are not sufficiently equipped: the result is a lack of gathering spaces for the community.

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Urban regeneration strategies: the short production chain

Reading the current features has permitted to set targets and strategies. The valorisation of the historical link between Grangia farmstead and Chiaravalle abbey, as well as the maintenance of landscape quality, represents what is to be achieved.

The purpose is to reconnect parts of territory to form a comprehensive territorial system in which every single element could regain its own meaning and role in combination with the others. After recovering its historical importance, it will be the Grangia farmstead to become the driving force for the economy and for the recovery of the urban centre.

For each target set, methods have been identified, and then established, in order to pursue objectives. Due to the agricultural vocation of the area, it has been thought of a regeneration based on the encouragement of the agriculture related to the local tradition, as a result of the preliminary study of the historical crops. The aim is to set up a zero distance production which can reduce emission of air pollutants thanks to the restricted amount of space and, consequently, to the decrease of fuel use. Selling *in loco* would lead to less use of plastic packages and food preservation systems; it would bring better quality control, as well as reduce production costs thanks to the absence of intermediaries between producers and consumers. In addition, the system would promote the development of the territory through direct knowledge between the producers, their collaboration with consumers and the possibility to visit and check work in local farms; in this way social involvement and relationships between people would be encouraged. The space identified for these predictions is situated on the edge of the urbanized town, according to urban planning directions aimed at preserving green areas from urbanization in Chiaravalle. This is meant to offer green spaces usable by citizens and schoolchildren, in order to stimulate the cultural and recreational activities and to reduce the impact of the near transport infrastructure. Agriculture regains a new value by setting spaces for experimental and educational cultivation projects, as well as vineyards, rice paddies, vegetable gardens and orchards.

Becoming part of a wider production system, agricultural activities may become a focal point in the enhancement of historical heritage (the abbey, the farmstead, springs and moats) and in the improvement of the environmental quality.

Another link in the chain is the Grangia farmstead, which has been redesigned in order to host not only preparation and conservation processes of agricultural products, but also educational activities such as learning pathways and the teaching farm. It would also be desirable to cooperate with local entrepreneurship or to involve research institutes that study about agricultural science. Indeed, the farmstead will accommodate schools, universities and associations through a guesthouse, welcoming and dining areas with the possibility to taste typical food and wine products.

Selling products takes place into the buildings around Chiaravalle's historical main square, which should be released from cars - conveniently located in a different parking area. In order to improve the quality of public space and the social relations between inhabitants, it has been planned to place stores of local products, as well as indoor markets, coffee shops, outdoor markets and meeting zone.

It is all meant to create a circular track in order to establish a net of relations between the farmstead, the abbey and the inhabited village, thus improving the viability and
enhacing the importance of hydraulic elements owed to the local farming culture.

Disused railway tracks can also be instrumental in making the productive mechanism work, as they could become a walking and cycling path alluding to the concept of water and agriculture with historical, educational and natural meanings. It is also intended to improve and secure all those pathways now rundown or particularly difficult to use. The transmission of historical and naturalistic values will be ensured by information signs, while it is suggested to protect valuable trees or put in place some new ones, where missing, in order to enhance the itinerary quality and to preserve greatly evocative settings.

Road user safety will be guaranteed by safe sidewalks and crosswalks, as well as by the establishment of a 30 Zone in the main streets of the town to encourage soft mobility and to reduce pollution.

Conclusions

Researches carried out starting from the entire Milan's area have enabled to understand the historical evolution of the urban units of ancient formation, including their permanence or their mutual incorporation.

The analytical methodology applied to Chiaravalle town has led to detect critical issues to notice, offering also a future perspective based on the possibility to create a net of relations between cultural heritage and landscape.

The aim of the research consists in suggesting design strategies applicable to urban areas, paying attention to historical and environmental aspects and to the compatibility of the intended uses found.

Chiaravalle is a clear evidence of a town composed of ancient paths connecting the farmsteads, cultivated fields and religious architecture in a perfect blend. System organization, consisting in agricultural cultivations, manufacture in farmstead and selling in the square, contributes to a sustainable purchasing project based on a short production chain, which summarizes a perfect synergy between primary, secondary and tertiary sectors.

The development of the production for direct sale through local agriculture aims to be an instrument for the recovery of the town's identity thanks to the rediscovery and the preservation of typical products and ancient flavours linked with the territory.

Lastly, economic feasibility of the project should be examined in order to guide the choice of those potential investors who, after a careful analysis, could be enticed to invest in such an enhancement project.

A possible scenario of future development could result from the involvement of private entities through agreements concerning the sale of products *in loco*. The main square of the town could operate in this perspective because it is characterized by residential buildings with disused spaces for commercial use on the ground floor. In terms of public institutions, the production could be managed in collaboration with the fruit and vegetable market SoGeMi[17], while the farmstead spaces as the guesthouse or the teaching farm are meant to involve schools. Partnerships with the departments of Agricultural and Food Science or Veterinary Medicine from the University of Milan could also enable to operate guided tours into companies representing green economy and sustainability.

In conclusion, it could be stated that the study carried out underlines the importance of reading urban form as a key element of regeneration for the town. The morphology of the territory therefore becomes the mouthpiece of a past productive tradition which aims to be an instrument of reappropriation of Chiaravalle's local identity.

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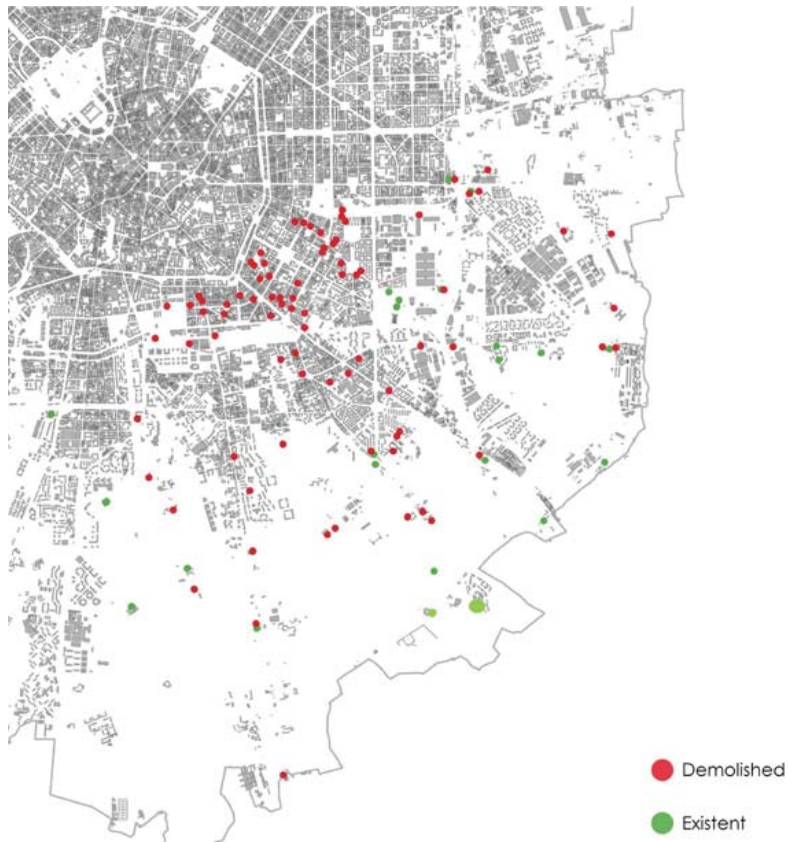**Figure 1.** Analysis of ancient farmsteads.

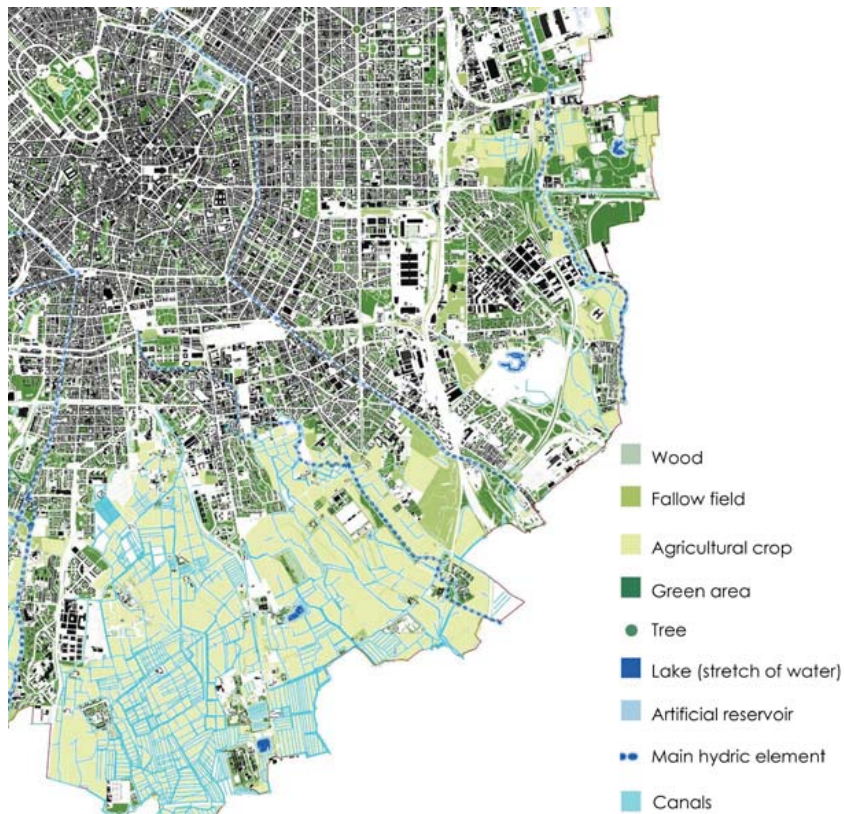**Figure 2.** Hydrography of the territory and green system.

Figure 3. The area under examination: (a) Chiaravalle abbey, (b) water plant, (c)(d) Grangia farmstead, (e) public spaces, (f) disused rail tracks (photos by the authors).

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Footnotes

[1] Since the urban settlements represented an effective trace of the development of the town and of production techniques, buildings are subject to restriction. To overcome problems related to maintenance or to be able to allocate areas to new buildings, the farmsteads result often abandoned and, in more than one case, for these the demolition has been achieved.

[2] Often lost or modified as, for example, Monluè once called Malnoe.

[3] The study has been carried out with the support of GIS Software (Geographic Information System) open source Qgis. Source of geographical data: http://www.geoportale.regione.lombardia.it/download-dati; https://geoportale.comune.milano.it/sit/open-data/.

[4] The differences between southern and northen parts are also confirmed by the characteristics and by the extent of green areas. The South Milan Agricultural Park covers 47 thousands hectares of private agricultural fields, while the North Park covers 640 hectares of public areas in order to encourage the use of green ground in a densely urbanized territory.

[5] San Giuliano Milanese, San Donato Milanese, Assago, Rozzano.

[6] Royal Decree of the 2nd of September 1923, n. 1912 art. 1 - Aggregation of eleven continuous towns at the city of Milan. As result of an urban reform influenced by the new fascist party, which had foreseen the suppression of eleven towns and their consequent administrative annexation to the city of Milan, the urban layout of the metropolitan city was defined as the current one. Towns affected by this measure were, besides Chiaravalle: Affori, Baggio, Crescenzago, Gorla-Precotto, Greco milanese, Lambrate, Musocco, Niguarda, Trenno e Vigentino.

[7] Part of the monastic production was sold in town's markets.

[8] Catasto Teresiano (1722), Catasto Lombardo-Veneto (1855), Catasto Cessato (1866), Istituto Geografico Militare (1888), Catasto Terreni (1897), PRG (1953), Carta Tecnica Comunale (1930,1956,1965,1990,2000,2012).

[9] Introduced by the Regional Law of April 23rd,1990, n. 24, South Milan Agricultural Park is a regional park which includes areas between Milan and the southern border of its province.

[10] Piani di Settore Agricolo, art. 19, LR 24/90, art. 7, NTA of the PTC.

[11] It is the former elementary school "Amatore Sciesa", today nursery school located in via San Bernardo 19.

[12] Casa Chiaravalle is a project of Passepartout, the Consortium of social enterprises which gives to the community a property confiscated to organized crime, promoting temporary housing, integration, training courses, job placement and intercultural initiatives.

[13] Born as an after-work organization, Enal is placed within the Amatore Sciesa school district and takes part in many initiatives into the village in partnership with other voluntary associations.

[14] Cfr: Piano delle Regole, Indicazioni urbanistiche, Vincoli e tutela in PGT adottato - Milano 2030.

[15] The research has been addressed with the support of Software GIS (Geographic Information System) open source Qgis. Source of geographical data: http://www.geoportale.regione.lombardia.it/download-dati; https://geoportale.comune.milano.it/sit/open-data/

[16] Although monks were back in Chiaravalle since 1952, the mill building, used as miller's house, fell into disuse in 1963 (https://www.mulinochiaravalle.it/il-mulino/la_storia_e_il_recupero/).

[17] SoGeMi (Società per l'Impianto e l'Esercizio dei Mercati Annonari all'Ingrosso di Milano) is a joint stock company which coordinates agri-food markets in the city of Milan on behalf of the municipality. The wholesale agri-food market of Milan stands out for its goods quality and variety of products at competitive prices, thus being the largest local producer in Italy.

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Rethinking marginal areas: urban growth and inequality in informal settlements, the case study of Usme district, Bogotá

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Keywords: *Housing, informal settlements, ecological structure, urban development*

Abstract

This article extracts some of the findings from the research project called "Hábitat popular y procesos de transformación urbana. Retos y oportunidades en la vivienda popular y la vivienda de interés social, caso de estudio Localidad de Usme, Bogota" which follows the descriptive qualitative approach of a case study. The methodology used for territory analysis is layered into three different scales: macro, meso and micro. These scales are cross-axial in terms of social, economic, political and environmental aspects. The critical and historical analysis of how the territory in Usme has been formed and its comparison with the current housing policies and regulations in Bogota will allow us to identify the logic that has coalesced the territory throughout time. In order to promote equity in informal settlements, it is imperative to rethink popular marginal areas by identifying its silver linings. The term silver lining will be used as a metaphor to illustrate the positive, hidden aspects of popular architecture that underlie beneath its "chaos". In order to find these silver linings, this article will first present an introduction to the district of Usme in Bogota. It will then explain some of the identified silver linings in urban analysis: i. Social space and citizenship building; ii. The hidden silver lining of Usme's urban growth and iii. Thresholds: from borders to boundaries and vice versa. The conclusion will argue about the importance of considering these silver linings and its implications for urban development public policies and planning.

Introduction

In Latin America, urban informality has become a characteristic feature of the land market in the city and"… it is associated with certain common and distinctive features of Latin American cities, including the existence of a low-wage regime, slow economic growth in contrast to high population growth, persistence of the informal economy, acute income inequality, all this added to very rapid urban growth and enormous weakness of the state apparatus. (Jaramillo, 2008. Cited in Camargo, A and Hurtado, A, 2013, p,81). A common topic throughout the continent is urban poverty reflected in the emergence of precarious settlements in the periphery that generate a barrier between the urban and rural condition. These conditions in Latin American cities conceal the existence of a strategy to equitably integrate those urban and rural areas, turning them into ghettos of informality and social exclusion. These situations have influenced the process of transformation and evolution of Latin American cities, propitiating an accelerated urbanization of the metropolitan peripheries. These peripheral areas have shown a vertiginous development in comparison with central areas. To make matters worse, they have been affected due to the presence of projects such as industrial and commercial complexes, or massive urbanizations of formal and informal origin with the consequent loss or reduction of agricultural land, natural resources, changes in productive activity and in the lifestyle of its inhabitants.

In the informal, peripheral sectors of the city of Bogota, there is a land-sale phenomenon by "pirate developers" who sell lots without having approval from the State through an urban planning license and without infrastructure development. This generates informality due to the lack of public services and land titles. In other cases, people appropriate the land illegally by de facto occupation. In this research, and as a result of multiple analysis, it was difficult to clarify the appropriate term to name the place and subject of study. Especially because we deal with a topic and context that has not been sufficiently analyzed or studied. In fact, informal architecture and its "vulgar", "illegal", "economic", "clandestine" and/or "ordinary" variants is of little interest in official or academic contexts. For this reason, we chose to name the territory, traditionally known as informal, as popular settlements, while the differentiator is the type of land and housing tenure. In the case of Colombia, it is one of the greatest problems generating violence due to the excessive interest of some people in land ownership.

The analysis of popular habitats is a commitment to the communities that have collectively taken over large extensions of territory over time, marking important points in the conformation of the city. In fact, (Saldarriaga and Fonseca, 1992) highlight that "the largest percentage of architecture that exists and is built daily in Colombia is produced by popular communities (p.15). Aspects such as inequity and inequality in Latin American societies are reflected in its urban structure and increase the existing segregation in these marginalized and vulnerable territories, not only spatially but also socially. The reality of urban processes in Latin American cities, and especially in the case of Bogota, shows the construction of a disjointed, extensive territory, full of fractures and needs that has received no understanding or adequate attention by the State and the private sector. This complete lack of attention is understood particularly from the logic of the construction processes of popular territories.

Introduction to Usme

The territory of Usme, like Bogota, is unique in its geography. It is part of the Eastern Cordillera, and of a unique ecosystem called the Paramo[1] de Sumapaz, a huge source of water. Usme is one of twenty localities in which the Capital District of Bogota is divided. It has a total area of 21,506.7 hectares, 89% of which corresponding to rural land, i.e. 18,500.1 hectares, and 11% to urban land, corresponding to 3,029.26 hectares. Of the urban land, 902ha correspond to urban expansion land. (Figure 1)

Following the founding of Bogota in 1538, the territory of Usme was assigned to agriculture around 1590 making it the pantry of Bogota due to its privileged location, and its fertile soil, perfect for agriculture and livestock. During the Colonial phase, in 1650, with its foundation as San Pedro de Usme, it maintained its rural character, reaffirming itself as a

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place for food production until the twentieth century. The change came in the 1930s with the increase of construction. It encouraged the extraction of quarry materials like gravel, clay and sand, which became a way of exploitation of the territory. As a consequence, the Usme settlement process accelerated due to the arrival of workers that needed to supply their housing needs near their work. In addition, population growth in Usme increased after the Bogotazo[2] on 9 April 1948. The intensification of violence in the country caused a migratory process, making Bogota one of the main receiving cities. Usme was consequently affected by these urbanization processes and internal displacement continued throughout the 20th century due to the armed conflict.

A historical review outlines many factors that contributed to the city's growth process and how it generated a division of the city based on economic income, social class differentiation, location of facilities and geographical aspects, a situation that increased poverty and segregation. One of the main factors that contributed to the urbanization process was the migratory phenomenon between 1950s and 1960s that began the transformation of the city. In the case of Usme, the relationship between the emergence of extractive companies and informal settlements is evident.

This allowed the emergence of a "periphery through umbilical nuclei connected by a road to the rest of the urban grid. Thus, for example, in the south of Bogotá, uncontrolled settlements prior to the 1960s initially emerged as a series of isolated nuclei until they formed a continuous and interconnected mesh, very organically linked to the rest of the urban structure, later giving the impression of an expansion in the form of an oil slick. On the contrary, after the 1960's, cores have emerged in very uneven topographic conditions, which remain linked to the rest of the mesh by a single interconnecting path". (Marín, G., & Elena, I. 1991, p.24).

The territory of Usme was initially inhabited by indigenous people, followed by the Spanish with their arrival around 1650. However, the change in population dynamics started between the 70's and 80's of the 20th century when the population increased from 6,394 to 164,847. The consequences of this disproportionate and unforeseen growth resulting from rural-urban migration processes are clearly seen in the territory in terms of morphology and urban and spatial relations. This increase in population gave Usme its heterogeneity, derived from the different origins of its population, coming from all the corners of the country. This multicultural population, shares a single common denominator, the fact that it is composed by low-income citizens.

The results of the research confirm the high degree of segregation, exclusion and inequality present in the city of Bogota, and specifically in the town of Usme. The analysis of the urban conditions allows us to establish that Usme is a socially homogeneous territory, with very low interaction between its different social groups and with spatial isolation characterized by the lack of a good offer of public transport or alternative mobility, resulting in longer travel times to reach the place of work or study. All kinds of deficiencies stand out in these poor territories, including lack of health, education, recreation, public space, trees, inadequate housing conditions, and a very high rate of unemployment.

First silver lining: Social space and building citizenship

The creation of public space and building citizenship are closely related. The current idea of the city from a material and economic point of view has generated countless problems. A significant fact is the disappearance of public space due to the generation of private, closed spaces that favor selective encounters and mass consumption. They also encourage the use of vehicles and cancel any contact with their immediate surroundings. According to Rogers (2000) "closed spaces satisfy our whims of private consumption and autonomy and are, in that sense, very effective. In contrast, open spaces bring something in common: they bring together different parts of society and nurture a sense of tolerance, awareness, identity and mutual respect" (p.10). In accordance with the above, public space plays a fundamental role in the construction of citizenship. However, it is important to note that such a role is not exercised only when rulers are elected, but also, contrary to the established model, every time there is active intervention in the decisions that unite us as a society.

The figures show Usme has an average of 4.88 m2 of public space per inhabitant. It is very low compared to the standard established in decree 1077 of 2015, which sets it at 15 m2 per inhabitant. In terms of the amount of public space allocated for pedestrians in terms of sidewalks compared to the total area of the locality and the UPZs, the DADEP 2017 says that the average of Bogota's sidewalks per hectare is 306.74 m2/ha, while Usme has the lowest rate at 43.93 m2/ha, well below the city's average. Although the figures and quantitative aspects are relevant, it is important to clarify that the urban sphere is associated with the public sphere and housing is related to the communal, private and intimate sphere. Since both scopes are the central axes from where the social life of the individuals is constructed, lifestyle and customs are established from them. Therefore, housing is assumed as a fundamental aspect that builds and potentiates the territory. Furthermore, it is one of the main aspects on which the construction of a territory revolves; it marks not just individual and family dynamics but it reflects its society and culture.

The first positive aspect identified within the territorial conformation in popular settlements has to do with social construction based on dynamics generated by the inhabitants themselves. In Usme, the diversity and typical vitality of these environments can still be perceived in commercial streets. An expression that should be promoted and maintained by improving, among other things, the physical conditions of these places; as well as those of parks, squares and markets. Additionally, the street and the sidewalk are recognized as an extension of the house, there is an appropriation through its finishing, its texture and color. In other cases, such an extension is brought into evidence with the presence of commercial premises in the first floors of the houses and the aggregation from the sidewalk by commercial premises, or with the intervention of the sidewalk or the street to generate orchards or gardens on the public space. On other occasions, the street is a meeting place, for collective celebration by the neighbors. In this sense the street is recognized as a place of social interaction. The street like the "neighborhood shop" becomes an element of integration and cohesion of the community, making it full of urban life. The fact of identifying a public place as a public good, creates situations that include self-regulation, tolerance and respect for others, and the recognition of the rights and duties that each citizen has.

In contrast to the above, the current housing supply planned in Usme shows the existence of closed complexes that are not related or integrated with the immediate context. Closed communities and ghettos are being created where the members of these closed groups are voluntary prisoners that have no interest in relating to the outside world or in meeting other people. In these state, low-income, housing projects, urban planning of popular sectors offers precarious, fragmented urban life with high indexes of insecurity. Even though public space has better conditions in terms of design, it is impossible to promote any sense of belonging, or a vibrant and diverse life in urban space.(Figure 2)

Second silver lining: Doorsteps: The hidden silver lining of Usme's urban growth
This research understands a doorstep as a place that engages and generates articulation. It is a transitional space between two situations or between one environment and another. The characteristic of such a doorstep is that it is configured by buildings. The space where doorstep is generated can be in the public or in the private dimension and it is the inhabitants of popular environments who build thresholds to generate relations that overcome and exceed their physical space, where nobody wants to be more than the other, where differences are recognized and the construction of social networks is propitiated. In this way, doorsteps are meeting spaces. In fact, the important factor is the emptiness and the relations that is established between the buildings, not the building itself.

In popular environments, inhabitants have spontaneously generated this type of doorsteps. The encounter with others is propitiated and relations are established beyond the building. Nevertheless, it cannot be ignored that in some cases empty spaces remain as a result of urban configuration, lack of planning, and as a consequence of the territory's configuration that is the sum of its independent patterns.

By making a historical reading of the morphology present in these places, it is possible

to evidence singular situations that have generated these types of patterns. Situations that are affected by geographical, social, economic and normative aspects. An important quality of doorsteps is its capacity to reconcile different patterns in terms of the urban form and to have a specific function that responds to the vocation of the place and the buildings that create it. In other words, the great power of attraction and mixture of different patterns give rise to hybrids out of all orthodox order. This shows how allowing identity and singular characterization of segments of the territory can be a valuable circumstance.

Recognizing the quality of doorsteps in the popular habitat to integrate different factors, actors, circumstances, is without a doubt, very relevant. It achieves the highly desired inclusion, even if it lacks technical and academic knowledge. Particularly if it is contrasted with the achievements of planned environments where homogenization, isolation and individualism are the most common strategies, without any reflection in the effects that this type of planning can generate in the construction of a society and a territory.

Urban morphology cannot be seen as a minor matter or from an exclusively compositional or eminent formal aspect. The proposal in this research is to see it as an opportunity to read how the urban form possesses the capacity to relate, through its threshold, to different factors that have affected the construction of the territory. Factors that go from qualitative and quantitative aspects that definitively affect the idea of the city. (Arango,1993, p. 199) mentions how Karl Brunner (1887-1960) conceived the growth of the Colombian city based on physically different units (in its layout, in its architectural characteristics, in its uses), which were connected with themselves and the traditional historical center, by promenades and avenues... the resulting city would be, therefore, diverse, within a general and unique order. The latter is one of the greatest particular challenges within the popular habitat, and a general defiance for the city. (Figure 3)

Third silver lining: From borders to boundaries and vice versa

In this research, a border is a line that separates and divides one place from another. In the case of Usme, some geographical characteristics of the territory become boundaries. It includes water bodies, streams and topography. They are elements that generate ruptures in the conformation of the territory and do not allow continuity and articulation. This situation increases the level of exclusion and the lack of cohesion between different areas of the territory.

Unfortunately, these ruptures occur often in popular settlements due to the impact and deterioration of green areas and water bodies. Although the above is related to the natural characteristics of the territory, planning also generates other types of limits, such as when facilities or planned housing solutions are built without taking into account the environment. This generates the inconvenient isolation and ghettoization of places for the good harmonic development of a territory. In addition to these examples, roads become elements that generate ruptures and there is no adequate fabric to minimize the impacts caused by the crossing of a road. These limits are morphological scars generated without considering any alternatives for appropriate relationship building and connection.

In the same way, closed communities and ghettos create closed groups where its members become voluntary prisoners and the condition of whether one is "inside" or "outside" is clearly evident. The question that arises is what idea of the city is being promoted with these closed environments and what values are being strengthened with this type of initiative? From this research perspective, housing proposals (in a particular way and the planning and ordering of the territory in a more general manner) must tend to build the city and create community. To achieve this, understanding the concept of limits and edges can be a more inclusive spatial and social organization.

On the other hand, the concept of boundary is defined as a space that articulates and links a place with another. According to (Ayala, 2015) a boundary is the region that is contiguous to the limit, an immediate region where society and landscape are framed by the presence of the limit. The quoted author mentions that "the construction of boun-

daries engenders a sense in people of being in the appropriate place or out of place (Storey 2001, 146). The boundaries then concretize the territory and what these territories mean. In this sense, they not only materialize the territoriality, but they involve the "here" and "there". Boundaries indicate, and at the same time unite and contain (people, ideas, prejudices, forms of life, goods, systems, etc.)". (p.176) (Figure 4)

In Usme you can see how the territory oscillates between borders and boundaries. In some sectors you can clearly see the boundaries that articulate the rural area from the urban area. There is a symbiosis between these two conditions. It is contrasted to the way urbanizations literally mark the border between one condition and the other.

Conclusion: The value of considering these silver linings and its implications for urban development, public policies and planning.

The development of the city of Bogota has been built on a concept of urban sprawl. The concept is supported by large urban projects such as the Northern Zoning Plan and the Usme Zoning Plan. These projects are located at the extremes of the city, one in the extreme north and the other in the south, continuing the logic of urbanization based on the periphery of the city. Previously rural land is being used for these plans, which are now land for development or urban expansion.

Those proposals established in terms of urban development seem to be aimed at satisfying figures and indicators of the city. Unfortunately, they do not involve the conditions and values present in the places for intervention, nor have they reviewed the effects that this type of proposals generate on the environment, the customs and the quality of life of their inhabitants.

The different factors that define quality of life are closely linked to social controls that are determined, among other things, by planning and design of the territory. Although the programs and policies established for the development of Usme are evident, what is not clear is the answer to the question of how public policies and legislation will promote integration between the different actors in the territory. As there is no clear or evident answer, issues such as the ecological structure, infrastructure, housing construction, social and regulatory aspects will be thought and executed in a disarticulated and isolated way, as it has been the case in Usme.

What was exposed in this article is the idea that the popular habitat should be a source to produce change in the way we intervene places and how we design houses. Learning from popular culture is something that can be combined with academic knowledge and market pressures to be able to interpret the responses present in popular architecture, in the here and now, in order to better develop planning. It means working with existing resources without judgments and stopping to analyze what happened or could happen. This would change the way in which solutions are generated. This position is not a naive or romantic vision of the problem. It comes from the conviction that the interests and concerns in architecture and urban planning could be focused on what exists and not on what should be. From this vision, architecture would be more attentive to find the means and strategies to improve the existing conditions of the present.

Therefore, we should recognize new ways of observing, perceiving and analyzing the popular habitat. This research presents an alternative to rescue some of the important aspects present in popular territories that can serve as a reflection and incorporation in planning urban policies and city planning.

Bogotá por localidades

SUBA
USAQUEN
ENGATIVA
FONTIBON
BARRIOS UNIDOS
TEUSAQUILLO
CHAPINERO
KENNEDY
LOS MÁRTIRES
BOSA
PUENTE ARANDA
CANDELARIA
SANTA FÉ
ANTONIO NARIÑO
TUNJUELITO
RAFAEL URIBE URIBE
SAN CRISTOBAL
CIUDAD BOLIVAR
SUMAPAZ

Convenciones
Usme

0.05   0   0.1 m

Figure 1. Localidad de Usme. Source: Own elaboration.

Figure 2. Comerce and public space. Source: Own elaboration.

UPZ GRAN YOMASA

☐ USME_UPZ

■ CONS UPZ GRAN YOMASA

▨ Manzanas

0   0,0450,09   0,18   0,27
                                    Km

Figure 3. Morphology in Gran Yomasa, Usme. Source: Own elaboration.

Figure 4. Boundary. Source: Own elaboration.

Footnotes

[1]Páramo can refer to a variety of alpine tundra ecosystems. The páramo is the ecosystem of the regions above the continuous forest line, yet below the permanent snowline. [1] It is a "Neotropical high mountain biome with a vegetation composed mainly of giant rosette plants, shrubs and grasses".[2] https://en.wikipedia.org/wiki/P%C3%A1ramo.

[2]El Bogotazo (from "Bogotá" and the -azo suffix of violent augmentation) refers to the massive riots that followed the assassination in Bogotá, Colombia of Liberal leader and presidential candidate Jorge Eliécer Gaitán on 9 April 1948 during the government of President Mariano Ospina Pérez. The 10-hour riot left much of downtown Bogotá destroyed. The aftershock of Gaitan's murder continued extending through the countryside and escalated a period of violence which had begun eighteen years before, in 1930, and was triggered by the fall of the conservative party from government and the rise of the liberals. The 1946 presidential elections brought the downfall of the liberals allowing conservative Mariano Ospina Pérez to win the presidency. The struggle for power between both again triggered a period in the history of Colombia known as La Violencia ("The Violence") that lasted until approximately 1958, from which the civil conflict that continues to this day grew.

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Morphological layers in Bucharest based on the spontaneous interior courtyards[1]

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Keywords: *Bucharest, interior courtyards, spontaneous city, voids in morphology*

Abstract

This paper traces the beginning of the urban development and the processual analysis of the historical tissue of Bucharest with its spontaneous urban transformations and structuring urban design. The base of this analysis is an urban form unspecific for the basic building type in Bucharest, but developed during the urban process or borrowed as a model: the interior urban courtyards formed in the commercial core-centre in Calea Mosilor (Mosilor Street). These hidden places of the ordinary city are in-between spaces soon to be dissolved in the contemporary city, replaced by the object-made architecture.

Based on the muratorian Typo-Morphological School of Urban Planning in Italy, and its continuity within the theories of Cannigia, the method demonstrates the mixed historical layers, short-time over-layered regulations and urban transformations, formal and informal activities in the city, some of them unaltered and exposed in those urban voids. We dissembled the historical maps, and examined the urban-planning regulations as the base structure of the paper, in order to identify the interior transformations and typologies: from the inns' courtyards and parishes' open spaces, to resulted voids in urban blocks.

Introduction

Hidden interior places in Bucharest, with an incertitude of semi-private or semi-public fragments of the city, and with a transparency of layers added in time, places resulted from a coherent historical evolution, those are the curious inherited spaces in the contemporary city that seem to gradually become undefined in the actual urban setting.

With a method initiated by the typo-morphology Italian School of Urban Planning, *Calea Mosilor* – one of the matrix routes of the capital-city – will be the focus for this article in interpreting the historical evolution of the urban block's voids. The existing maps of the city will be discomposed and overlapped in search for the urban transformation processes and for the heritage of the present tissue.

The premodern structure of the city with respect to the matrix route Calea Mosilor. Purcel Plan – 1789

The first plan considered for this study, *Plan Purcel 1789*, indicates the main trade routes in Bucharest. The consequence of those territorial routes is a village settled on stable ground, next to the river banks, at the cross roads: from the old capital-city Târgoviste, from Moldavia, from Craiova, and at an appropriate distance from the Carpathian area and towards the most important strategic and defensive border, the Danube. In time, the village from the cross roads and around the main citadel became a city-market described as an urban tissue with a radial-concentric structure that has assimilated other small villages.

The urban nucleus of the commercial aggregate was called the *Central Market-Fair*[2]. The *Inside Market-Fair (Târgul Dinăuntru)*, it is said it took place just outside the commercial tissue (Mihăilescu, 2003, p. 115) in the close area of *Sfântul Gheorghe Vechi* Church (block 2o). As Bucharest became not only a place of local trade markets for the landlords, but gradually a key connection point along the transit of the merchandise between South-Eastern and Western Europe (Georgescu, apud Mihăilescu 2003, p. 88), the necessity of a bigger place for the fair created another one – *The Outside Fair*[3], on the alley towards important territorial routes, which become *The Alley of the Outside Fair*[4] *– the caniggian matrix route* (Caniggia, 2001).

In the reading of this first cartographical layer, we can also see the *secondary building routes and the connecting routes* (Caniggia, 2001, p. 100) which were formed by embracing the religious structures of the city: *the parishes.* Those religious concepts were ideas inherited from the oriental influence (Stan, 2012, p. 101) by the reasons that Bucharest and the entire Wallachia was under Ottoman domination, and under the Rules of Phanariotes (until 1821). Therefore, the oriental model of Istanbul it is seen also in the stories and imagery of the city, from the behaviour of Greek rulers who were copying the Ottoman court (Radu Olteanu, 2002), to the vocabulary, culture and architecture.

A parish functioned like a local micro-identity unit in Bucharest (Voiculescu, 1997), and it is considered to include a large area around the main church, with scattered houses grouped by their handicraft or typical merchandise, with different additional functions around it: inns which helped sustaining the churches, schools to educate the community, even hospitals. With the process of time, the parishes were developed in the neighbourhoods of the city (Mihailescu, 2003, p. 102) and transformed their name into *mahala* (from Turkish word of *neighbourhood*). At the end of the XVIIIth century, there were dated around 80 neighbourhoods of such type of which 60 bear the names of the previous parishes (Georgescu, Apud Voiculescu, p 151). Concerning the regime of property in the area, following the model of Istanbul, the possession of lands belongs entire to the ruler (Voiculescu, 1997), then to the noblemen, donated or sold to the parishes and monasteries who used them mostly for agricultural purposes, and after that sold also to the population. Around the matrix route discussed here, which started to be the most frequented route in town, the land is in its major part in the property of the churches/parishes who knew best what land to sell or to lend to make more profit.

Therefore, in the matter of urban courtyards we're interested in, from the urban-reading of *Purcel's Plan* we can interpret the *base building tissue* of the city (Caniggia,

2001) – the first incipient urban infill formation that is trying to create an outlined interior space. T

The spontaneous densification process, started around the main routes and around the parishes, caused a big free area in the interior block, used only for agricultural function in most cases. (block 2°, 3°, 9°, 14°, 18°, 22°).

We can also identify on the plan a pre-existent typological enclosed space, the courtyards of the inns: *Papasoglu's Inn* (block 2°) which makes use of the entire plot, and the ensemble of the Church of *Sfântul Gheorghe Nou* (block 6°) which follows the model of previous monasteries founded by the sovereign throughout the country.

The beginning modernization of the inherited urban structure
Borroczyn's Plan 1846 / 1852

The modernization period of the urban structures starts with the implementation of the *Organic Regulation* in Wallachia in 1831: from the imposed limits of the city that previously couldn't control the sprawling, to the densification of the building tissue around the commercial nucleus, an important consequence along the matrix route and the *new connecting routes* (Caniggia).

Similarly, for the necessary modernization of the urban structure, the authorities formed the commission for "*embellishment of the city*" (Panoiu, 2011, p.79), and, to that end, a regulation was added to the *Organic Regulations* (which became the state-structure for the country). Thus, the authorities controlled the dimensions of the streets, authorize their enlargements "*with four palms*", allocate their pavements, demanded the demolition of bad-state buildings, created new building alignments, new urban squares and new public buildings (for example: The National Theater). The entire new directive proposed by Russian authorities was oriented towards the occidental development of the cities, in order to gradually reject the ottoman influence.

The same way happened for the social and cultural development in Bucharest in searching for a European identity (Zahariade and Criticos, 2007, p. 36). As a consequence of this new period there is the incipient entrepreneurial character of the capital-city. The regulations force the authorities, the landlords and the churches, to sell their land in order to be used (Lascu, apud. Stan, 2012, p. 128) and therefore, the new capitalist image is seen in all the public functions created in the private plots acquired by the locals. Along the entire matrix route, we will identify little factories, taverns, workshops below the living functions, all of them with a small garden at the back of the plot.

Giuseppe Strappa states in the context of typo-morphological Italian school of urban design that: "*The resulting land parcelling produces lots of almost constant thickness and variable depth. The lots repeated thickness (and, therefore, of the dwellings) is explained by the strength of the customs, which correspond to the unitary constructive, economic and distributive needs of the house.*" (Strappa, 2019). Even if the discussion suggests the evolution of the Italian row houses, accordingly, it is interesting how we can see similar plot dimensions in the urban-reading of Bucharest along the matrix routes, with the new formations of the plots acquired from the landlords or from the churches (block 2°,4°,7°).

As far for the interior free space developed in the urban aggregate, we can identify an almost enclosed space around the churches who sell their lands, but still keeps as property a big part of the interior surface of the urban block (block 2° - Church *Sfântul Gheorghe Vechi*, block 7° - Church *Sfântul Razvan*). In the background of the interior urban image of the church, the little entrepreneurs build houses in the frontlines, with similar depth, and with little annexes on the lateral limits of the plot. The gardens are connected to each other, which reminds us about the agricultural core area still present in the city. In the foreground of the interior block image, the church started to be gradually surrounded by functions needed for the administrations of the parishes. (block 2° - Church *Sfantul Gheorghe Vechi*, block 7° - Church *Sfantul Razvan*, block 4° - The Catholic Church).

This intimate core reminds us the spatial heritage of the parishes <<the vague terrain>> (*ro. maidan*), a term that identifies a free space retreated from the commercial roads which the perishes appropriated for the public manifestation in the holidays and reminds us that the parishes are still the polarizing elements from the community's point of view.

The cases of the existent urban core defined by the big area of unified vegetable gardens of the private plots will become for the next period the determinants for the modern building tissue, and the subject for the efficient use of the terrain (block 3°, 8°, 11°).

In conclusion to this period, we argue that the little small private plots put up for sale, aligned to the big area inherited from the agricultural use of land show us the first *oxymoronic type of relation* hidden to the first look in Bucharest. Juxtapositions that seem to predict incompatibilities for the evolution of the built area, will become an ordinary element in the present image of the city (block 3°, 11°, 15°).

On the built tissue and on the urban regulations of the next period, we will see consequences of the *Great Fire* of 1847[5] on: new building alignments, new administrative structures for the central part of the city, new urban projects for the burnt area, new building requirements, and the struggle for the efficient use of the terrain.

A new image for the city.
The plan of the City Bucharest - Geographic Institute of the Army, 1895-99
The cadastral plan of the City of Bucharest, 1911

The natural hazards, the amplified desire for a total modernization of the new capital of United Principalities of Moldavia and Wallachia[6] and the increasingly powerful French model from the west, changed a lot of aspects in the structure of the city, especially in its regulations. The first urban building regulations from 1878 - *Regulation for the constructions and alignments* (to which in time were added different important documents) - were the first eloquent legislation of the urban development (Lascu, 1997, p. 80).

In addition to the previous efforts, at the moment, the city had a clear goal for the development of the streets, of the buildings (heights, surface on the terrain, alignments), for the sanitation, but also for the creation of new urban re-structuring routes. With the exception of the routes designed for the efficient use of the urban core, there is also the French model of the Haussmann's boulevards in France, with their new building typologies in closed regime that will also be applied in the city.

To improve the foreigners' impression of the city, like Ulysse's de Marsillac's "*Bucharest is nothing else than the result of over-layered villages*", (Ulysse's de Marsillac, apud Derer, 2015), the authorities are in search of a new urban image, so the recent boulevards and also *Calea Mosilor* will benefit of being developed under the influence of western model. *Calea Mosilor* will be anticipated now for multifamily housing built in continuous frontline, with attention at the built surfaces and interior spaces (block 2°, 4°, 5°, 6°, 7°, 8°, 9°).

With regard to densification subject and the sanitary points required in this period, it is the first time when the percent of the used terrain is planned[7] and it is the first time when the interior spaces are considered urban spaces. In this manner, the agricultural uses are not permitted anymore in the image of the city "the courtyard will be levelled and laid on stone pavements, gravel, asphalt or systematic wood" (Lascu, p 92.). Also, there is an interest in the transition from the public space to the interior space with different types borrowed from the occidental influence (block 8° with interest in the geometry of the interior space and urban perspective, block 17°, block 22°).

At the level of the existing island aggregate and their interior cores, the spontaneous densification and the maximal use of the plots created a special interstitial space around the churches, that emphasized their enclosed image more than the previous period did. Buildings, school, workshops, appeared connected to the church's parish, so the interior urban void became a common courtyard, protected from the exterior, like a hortus conclusus for the parish's community (block 2°, 4°, 7°). But, in parallel, in the adjacent tissue, the locals continued to add to the existing buildings required equipment[8] or storage rooms. The entire perimeter of the plot grew in additive building without any relationship established with the communicating courtyards and caused blind walls towards common spaces (the adjacent plots of the churches: block 2°, 3°, 7°). Without any harmonious relation between that kind of urban elements, it is for the first time, in 1901, that there is an interest to make the churches a potential landmark and a little small step was made to protect them from hurtful connecting buildings and functions. Therefore, some annexes

were demolished, and, for the esthetical urban image, the blind walls were decorated (Lascu, 79-108).

Another enclosed type of courtyard in the city's tissue, are the inherited courtyards from the public function like the inns (Solacoglu's Inn 13°, Patria Inn 3°, 12°) with effectively used plot, but also with big courtyards for the merchandisers.

From the point of view of the inherited plots, there are also some consequences of the modernization of the city. The re-structuring routes caused the metamorphosis of the plot[9] with a new front line, but with the existing lateral and rear limits (block 16°, 17°). The development engaged in the efficient use of the terrain caused also the re-planning of the plots structure (11°, 15°) or of the entire block entity (2°).

The Interwar Regulations of the city

From the previous period, the urban structure inherited a first and important step in the legislation for the city modernization, which, over time, proved its gaps in instrumenting the regulations of the urban planning of the existing morphology. The borrowing of the occidental model seems enough just to show us "*a form without background*", but succeeded in making the entire professionals re-think and improve the urban morphology legislation locally by reviewing the present problems of the city.

An important issue of the densification process was the urban block and the mixed of adjacent tissue with different typologies, without a complete coherent relationship between its elements. In the succeeding period, studies were made for the image of the urban block in entire entity and organism. Therefore, Cincinat Sfintescu (the creator of the first *General Plan for the Systematization of Bucharest* in 1921 and part of the first generation of urban specialist) analysed the optimal characteristics of the urban blocks from the point of view of: 1. Hygiene, technique, aesthetics; 2. The neighbourhood area; 3. The block form, disposition and relationships of its elements (Sfintescu, 1914). Consequently, to the following legislations (1928 and especially the one from 1939) there were new improvements which controled this problem, and for the central part of the city, we count: the new alignments imposed for buildings in the rear part of the plot, the new urban core released from other buildings (Lascu 1999, p. 246) and the controlled dimensions of the interior courtyards in the urban block.

In the interwar period, succeeding the big demand of housing and the studies of the first *General Plan of Systematization*, the overall image of the city changed because of the great building activity, especially of the multi-storeyed housing (Lascu, pp. 363-364). The re-structuring routes from the previous period in incipient states, the unoccupied plots and vague-terrain around the city-centre were now filled with a new modernist appearance of the city. This can be seen in the complete boulevard façade (block 16°, 17°, 20°, 21°, 22°), in the new typologies of interior spaces of the common courtyards (block 7°, 12°) and also in the new efficient use of the terrain, the peculiar cul-de-sac created with insertions of art-deco influences (block 14 °).

This period completes the purpose to refocus the public interest towards the new built boulevards of the city. Supported by the diagram of *Space Syntax*, Sebastian Stan states that the entire hierarchy of the urban structure changed from the initial route and from the initial polarizing elements, the parishes' churches, towards the new boulevards which become the new generators of urban form (Stan, 2012, p. 162).

Calea Mosilor gradually lost the urban attention: the inns and the taverns are replaced by new hotels and restaurants, located at the main boulevards, but the commercial public functions will remain still active in the area with the workshops and typical merchandise well-known for.

The actual cadastral plan of the City of Bucharest, 1991.
The actual incomplete image and its conclusions.

For this last part of the paper, we choose to discuss in separate section the urban image of the 1991 from the one of the interwar setting because of the totally different social and political context (even if there isn't another relevant cadastral map for the previous section).

We specifically delimited the area in order to explore a region which lacks in physical socialist interventions, traumatic for the historical heritage of the building tissue – this is also the case of the two displaced churches left without context heritage, which can be found at each end of the analysed historical route – Church of *Sfântul Ioan cel Nou* (block 1°) and Church Olari (block 19°).

On the other hand, this part of the city experienced a totally different kind of consequence. Another layer was added to the historical tissue of *Calea Mosilor*, and it wasn't even a measurable one in the beginning: the lack of property caused by the socialist laws, starting with the *Law from June 1948* concerning the *Nationalization of industrial, insurance, mining and transport banking companies,* and continuing two years later with the *Decree 92/1950* for the *Nationalization of buildings and properties.* The old inherit tissue must be now at the use of pollical changes: the private property, houses, and apartments was exploited by their usage for multiple families. The property was now divided, the dwellers tried to obtain a decent standard of co-living with the addition of spontaneous annexes and informal activities that weren't predictable for most of the historical building tissue. From this point of view, the interior existing courtyards, a morphological element legislated so well for the urban image in the previous period, became now occupied almost completely by those unusual annexes and informalities (block 11°, 12°, 13°).

Furthermore, from the point of view of looseness of the built tissue, the historical monuments suffer because of the natural hazards (the earthquakes from 1977 and 1986), because of the consequential poor administration, and also because of the lack of responsibility and ownership awareness. Most of those peculiar places of the ordinary city enclosed by the urban facades are now dissolved and replaced for new abusive activities (block 2°, 5°, 7°).

After the *Romanian Revolution of 1989*, the enthusiasm of the Law of Retrocessions was followed by a period of complicated and ambiguous process with the implications of different actors (Iancu, Bogdan and Manolache, 2016). Buildings from the old *Calea Mosilor*, a route that didn't had the chance to find a new refreshing use for more than half a century, were put under this restitution process. They became either abandoned or neglected in the hope of retrocession process, either temporary occupied by the vulnerable homeless families, so in this way the owner intentionally benefits of the degradation of the historical building and of the real estate speculation of the land, for the future investments (Suditu, and Vilceanu, 2013).

In the first following years, the contemporary insertions in the building tissue didn't display a proper setting with the existing tissue and didn't have a clear legal framework of the urban-planning, especially in the historical area of the city (block 7°). The setting of a traditional evolutive tissue is gradually brought at risk to lose its consistency.

This paper is part of a bigger study of the city's image, particularly for the decomposition of the urban elements and their evolution in the purpose of searching for adaptive stitches in the future urban-design. The *Old Calea Mosilor* still keeps intact its previous evolution (without traumatic intervention of the new installed regime) in a peculiar relationship with the built environment, but now with a less consideration of the urban space than before (Figure 1.).

The urban image and its *hidden architecture* (Caniggia, 2001) of *Calea Mosilor* is a juxtaposition of substantial cultural influences, each of them necessary for the modernisation of the city. From the oriental architecture to all the steps towards the elegant envision of the modernism, discovered gradually in the interior voids of the urban blocks, we need to learn to be aware of the hidden layers, of the urban experience, and together with a *new pair model of morphology-events* (Alexander, 1997) to regain the unused city of Bucharest.
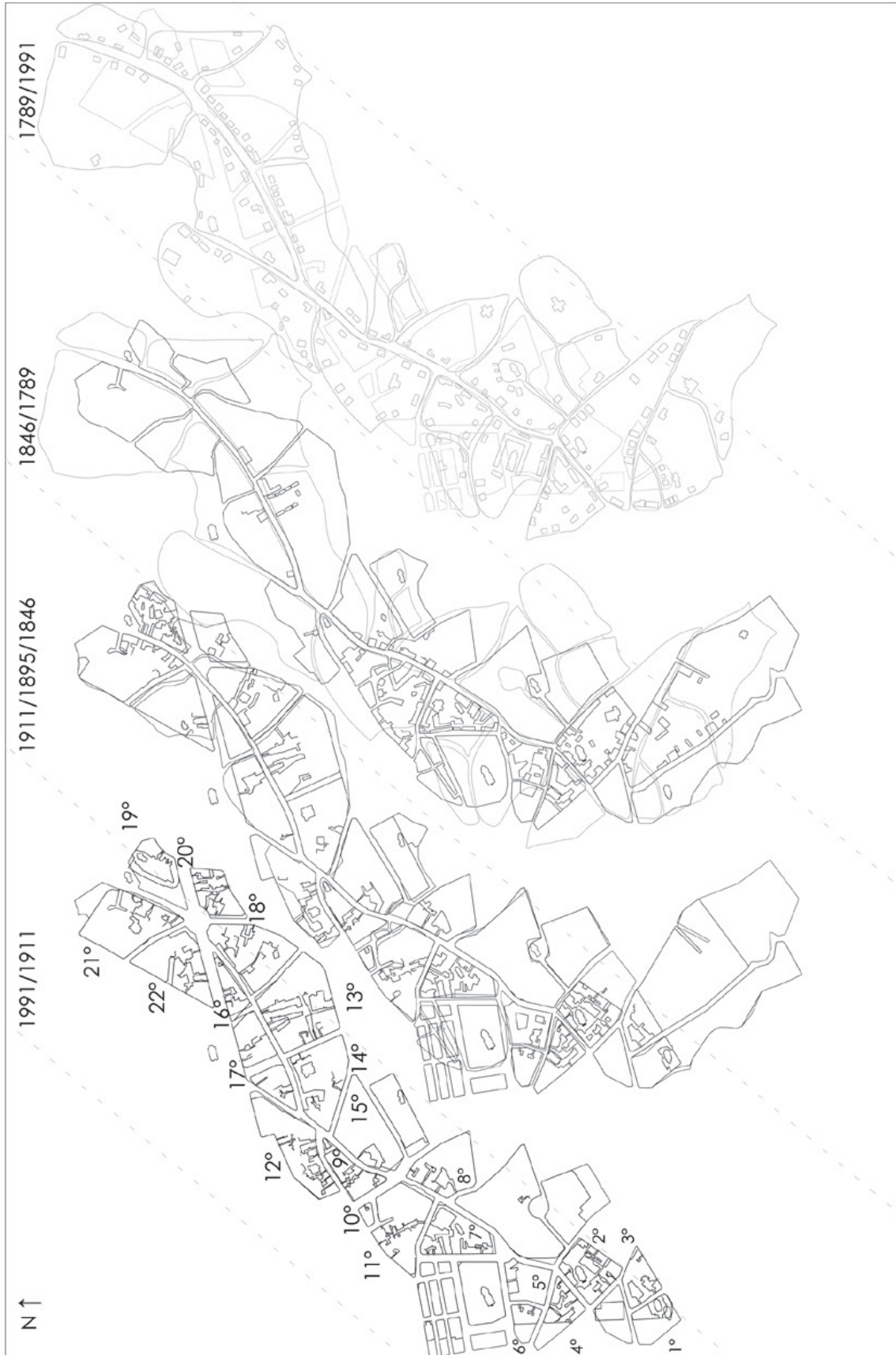
Figure 1. Overlapping periods on Calea Mosilor of the urban structure elements and interior targeted voids: 1991-1911, 1911-1895-1846, 1846-1789, 1789-1991.
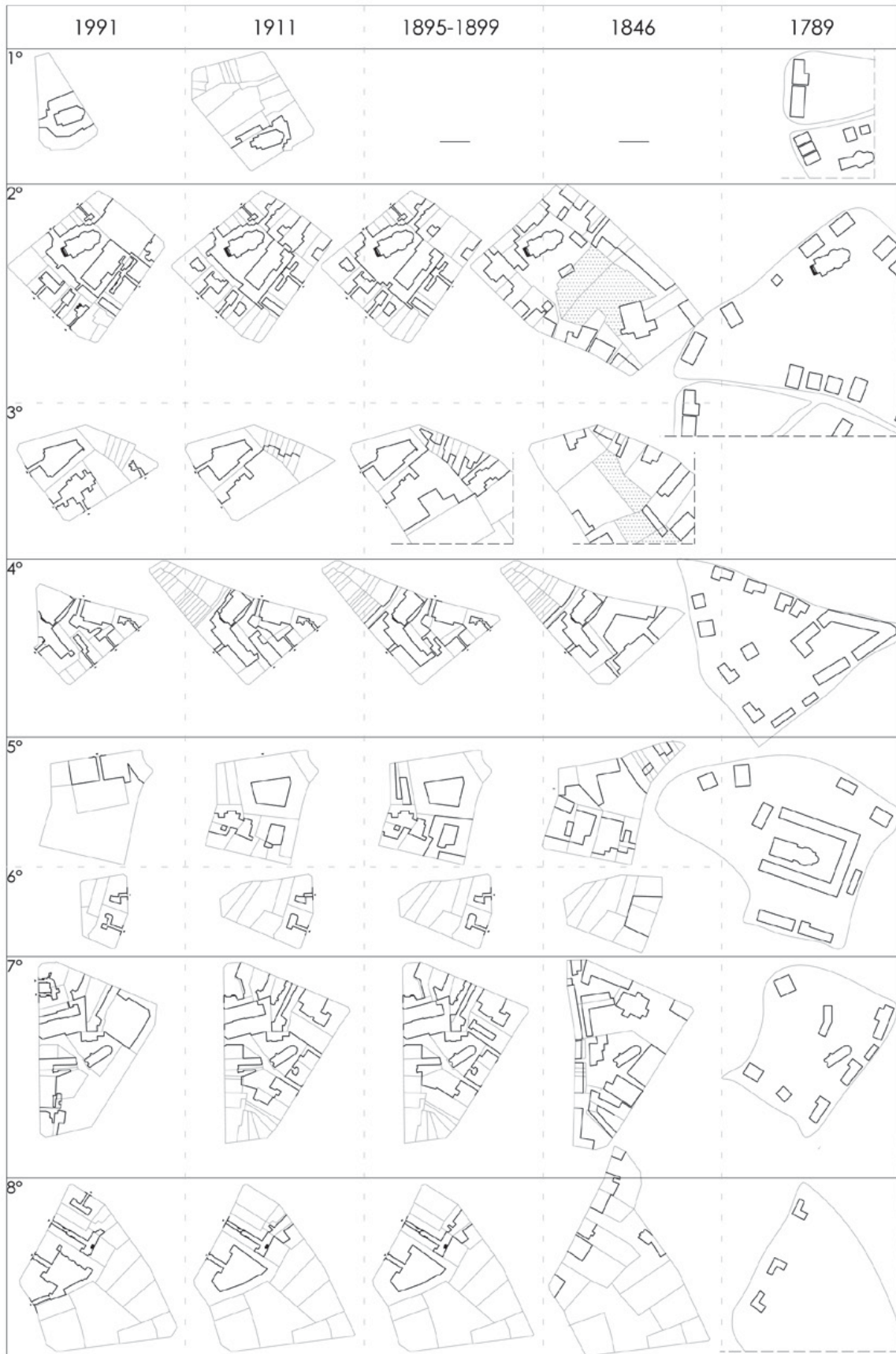
Figure 2.1 Tissue evolution with focus on the adjacent built elements of the courtyards.

Figure 2.2 Tissue evolution with focus on the adjacent built elements of the courtyards.

Figure 2.3 Tissue evolution with focus on the adjacent built elements of the courtyards.

Footnotes

[1] This research was realised during the fellowship as a member of the *Romanian Accademy in Rome*, obtained with the support of the Romanian state through the national scholarship program "Vasile Pârvan".

[2] For the term *târg* as *fair*, the Romanian language has accumulated meanings in the common sense of the word. Mihăilescu also explains that "the locals called Fair even the centre part of the city, even at the beginning of the XXth century [..] *The Central Fair* was more than the commercial streets with shops and workshops from *Sfantul Gheorghe* and from the crossroad of Victoriei Street with Lipscani Street" (Mihăilescu, 2003, p. 113). Therefore, the word *fair* must be understood, on one hand, as the place where the *market/fair* happen, to witch is added a specific geo-localisation name (*The Inside Market-Fair, The Upper Fair, The Old-Men Fair, The Gowk's Fair)*, but also, on the other hand, *The Fair* or *Central Fair* in the common language of the Romanians is illustrating the town itself.

[3] The documented for the fair is 1693 in the chronicle of Constantin Brâncoveanu (Gavril, Constantinescu 2007, 255)

[4] This was the initial name of *Calea Mosilor*. After the pavement of the street was called *The Bridge of Outside Fair – Podul Targului de Afara*. It is not sure when the name changed into its actual form *Calea Mosilor*.

[5] The fire from 23 march 1847 destroyed a big central part of the city: 10 neighbourhoods from the central area of the city, *2000 buildings from which 130 houses, 354 shops with a second floor, 713 houses without a second floor, 10 inns, 7 churches*, etc. (Olteanu, 86)

[6] This period contains also *the Independence war* and *the Proclamation of the Monarchy.*

[7] In the beginning 2/3 maximum built of the surface was permitted, without considerations for the neighbourhood character.

[8] One important annex added to the extension of the houses, was the mandatory sanitary equipment of the bathroom (Lascu, 1997, 93).

[9] The Conzen understanding of urban morphology is applied on the city Bucharest by Sebastian Stan, 2012.

Illustrations and tables

The next plans were used as the base for the illustrations:

1789 *Purcel Plan*, 1846/1852 *Borroczyn Plans*, 1895-99 *The plan of the City Bucharest - Geographic Institute of the Army*, 1911 *The cadastral Plan of the City of Bucharest*, 1991 *The actual cadastral plan of the City of Bucharest.*

Figure 1. Overlapping periods on Calea Mosilor of the urban structure elements and interior targeted voids: *1991-1911, 1911-1895-1846, 1846-1789, 1789-1991.*

Figure 2.1 Tissue evolution with focus on the adjacent built elements of the courtyards.
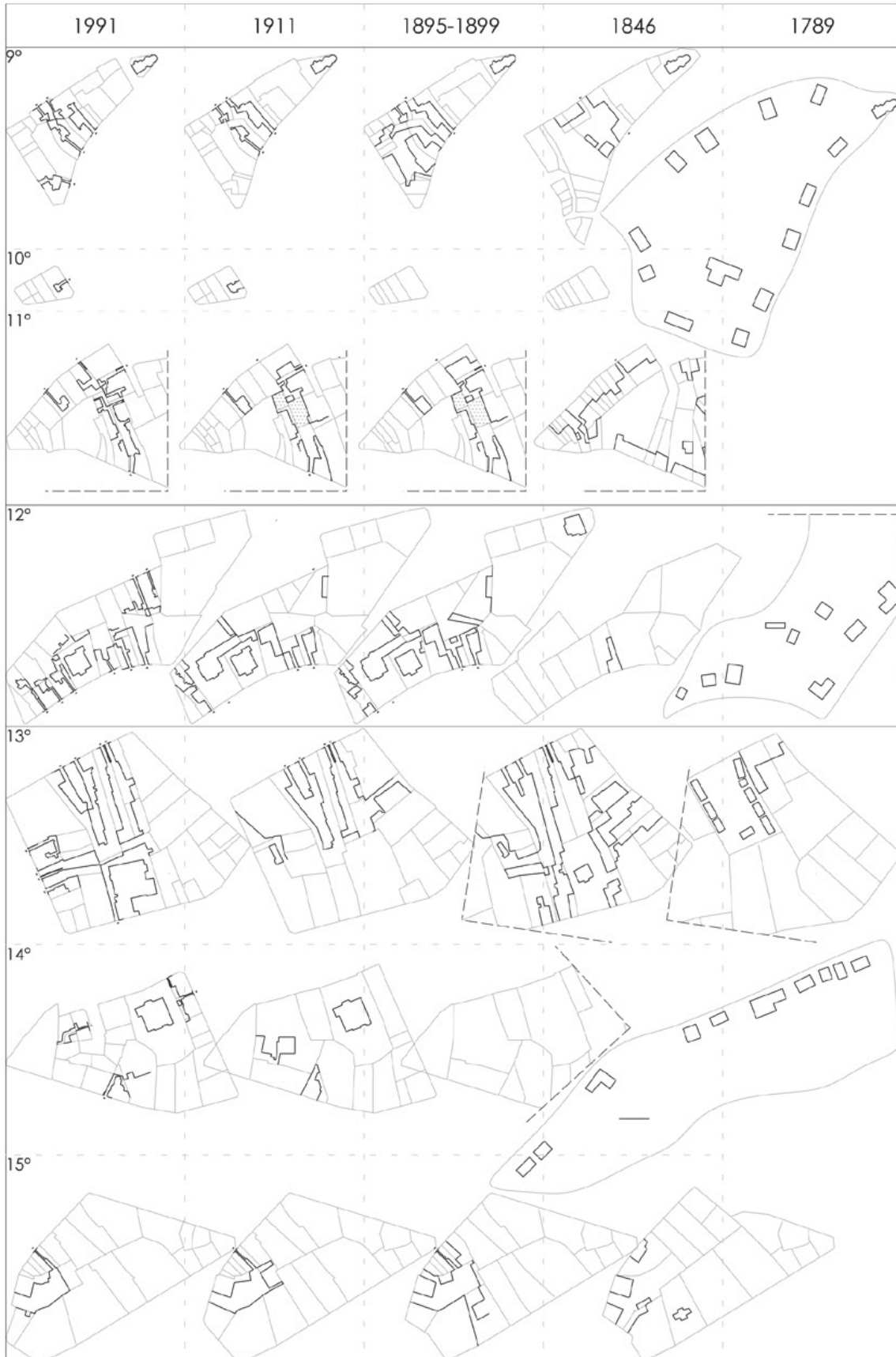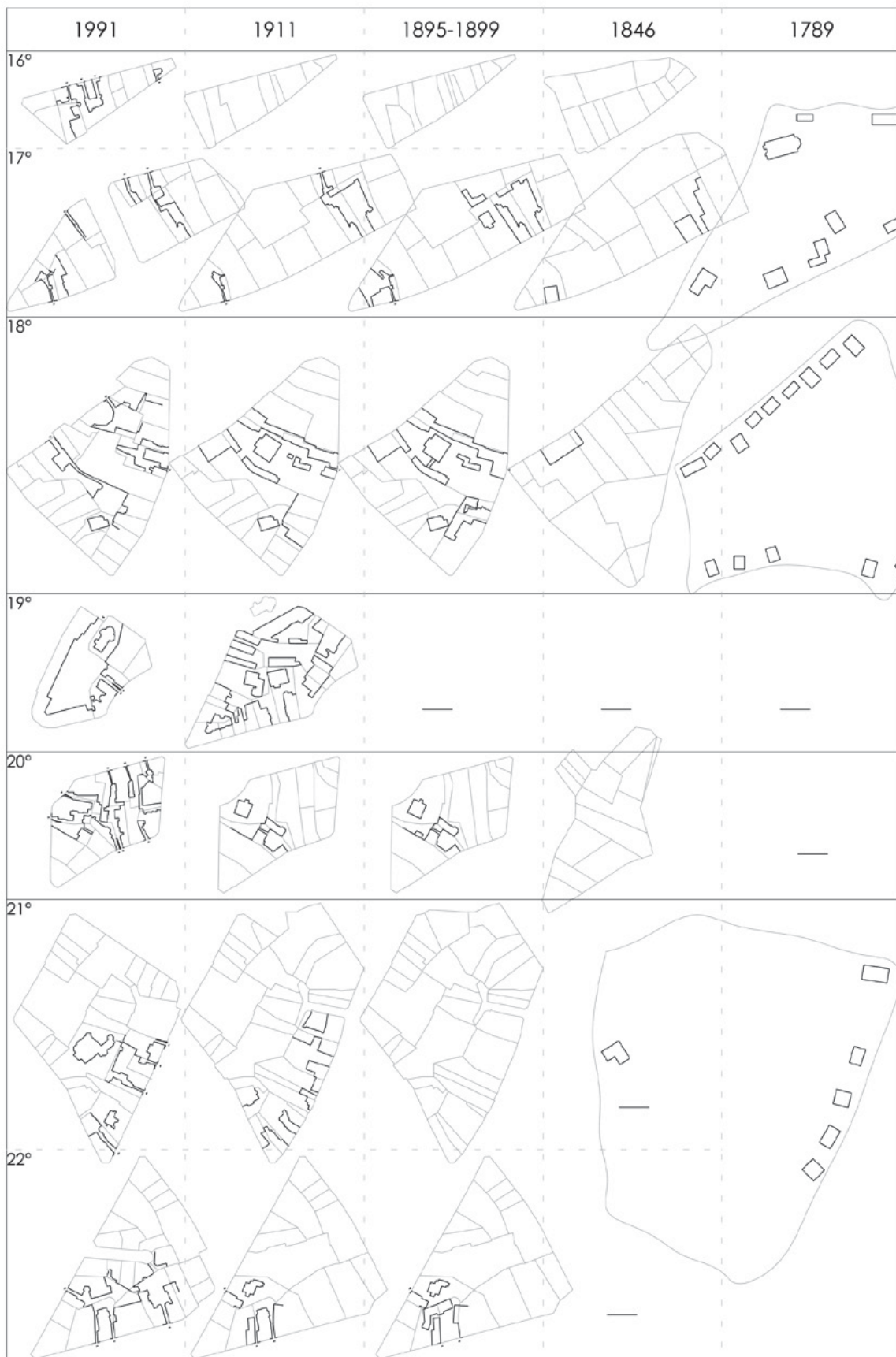Figure 2.2 Tissue evolution with focus on the adjacent built elements of the courtyards.
Figure 2.3 Tissue evolution with focus on the adjacent built elements of the courtyards.

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A Gentrifying Pattern of a Global City. Case of Karakoy, Istanbul

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Keywords: *Gentrifying morphologies, neighborhood change, global city, Istanbul*

Abstract

Over the last decade, Istanbul has been experiencing a series of rapid large and small scale urban transformation processes and the city, as a whole, is being gentrified. This research aims to understand how the usage of city's spaces and the fabric of everyday life are changing, as a consequence of spatial concentration of urban tourism and cultural globalization, in the inner cities of Istanbul through a case study. In the historic inner-city neighborhoods of the city, which date before the 15th century, new consumption industries seem to originate changes in land use and in the building typologies through redevelopment and densification processes. Karaköy is the emblematic example used to understand the undergoing gentrification pattern catalyzed by free-market mechanisms that are benefiting from global trends. On the one hand, the study wants to show the before and after changes through comparative mapping in the specific area, on the other hand, tries to put in use the urban morphology as a tool to codifying non-spatial dynamics that are transforming the present urban territory. In short, Karakoy, Istanbul's selected inner-city neighborhood, serves as a microcosm to discover transiting morphological legacies and aims to become an agency through which gentrifying forms are codified as the new fragments of the contemporary city.

Introduction

   Over the last twenty years, neighborhoods of Istanbul have been experiencing a series of rapid large and small scale urban transformation processes. These restructurings, on the local scale, can be seen as the result of the willingness to reshape Istanbul as a global city, while on the world scale, are the result of globalization and the switch of work sectors due to the economic and technological developments during the last six decades. Introduction of tourism as a procedure of urban regeneration and introduction of global flows into local context have become latest driving forces which foster the current forms of gentrification (Gravari-Barbas and Guinand, 2017; Sigler and Wachsmuth, 2016). Such global dynamics are evident in the current urban transformation agenda of Istanbul. 2009 Masterplan, which sets the future vision for a period of minimum twenty-five years for the city, declares an intention for the decentralization of the industry and encourages qualified service sectors such as finance, insurance, tourism, culture industries and real estate for the envisioned development of the city. These dynamics are today reshaping the existing urban legacies of Istanbul which have been reshaped for centuries under different cultures at a different pace. One of the patterns of transformation born in the light of such emergencies takes place in neighborhoods within the historical core where there is room for new consumption sectors leftover from expired manufacturing and industrial related activities. These areas with high rent potential are today being gentrified by free-market mechanisms (Turkun, 2014) which cause changes in the land use and building typologies that can be codified through the instrumentality of urban morphology. In this context, this research aims to understand how the usage of city's spaces and the fabric of everyday life are changing, as a consequence of spatial concentration of urban tourism and cultural globalization, in the neighbourhoods where they are proliferating. The paper focuses on the functional and typological transformations which take place in the neighborhood of Karakoy, in the core of the city situated in front of the historical peninsula of Istanbul as the result of unfolding gentrification processes. Istanbul's overall urban growth is briefly explained in order to understand the urban context at a larger scale. Later, Karakoy neighborhood's morphological occurrence is presented and the results of the field survey of the specific area are analyzed through maps. The field survey was conducted and the contemporary commercial and touristic functions together with the typological changes were laid out. The work represented in this paper is preliminary results of an ongoing research.

The Growth of a Global City: Istanbul

   Istanbul, a megapolis with thirty-nine districts, today, is one of the most crowded 21st global cities with a population estimated around fifteen million. In this huge polycentric urban context, the historical core of the city occupies a little part of the overall built-up area and is divided into three sections separated by the water. The two areas are located on the European side; the historical peninsula, in the southwest and Beyoglu, on the northwest. The third one is Uskudar together with Kadikoy areas which are located on the Asian side of the city. In this limitless territory, these three sections can be considered as the most aged parts from where the city has expanded along two main corridors; one along the Golden Horn, other along east-west axe. Istanbul has a long and dynamic history which with no doubt affects its current constitution and future. The city, as a true mélange of different urban forms, has been reshaped in many instances as an outcome of divergent regimes since its twenty-seven century-long life. First roots of the city were established in 7th century BC as a Greek fisherman's village and were settled on the first plateau of the seven hills, called Sarayburnu hill, where Bosphorus, the Marmara Sea, and the Golden Horn intersect. The Golden Horn, the inlet of Bosphorus which penetrates in European land. The topography of Istanbul, most importantly the form of Golden Horn and the hilly nature of the land, have always played an imposing role in determining the shape of urban development since early settlements to ulterior. In 330 AD, Romans rebuilt a great part of the existing territory under the logic of a Roman city occupying mainly the west of the peninsula. With Byzantium becoming Constantinople, the city was expanded and modeled with a vision of an imperial capital reaching up to a population

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of forty-five thousand people (Kuban, 1996). Later, when Constantinople became the Muslim Ottoman capital in 1453, the city was transformed rapidly under the urban notions coming from the Islamic culture. The concept of an Islamic city shaped the city with an irregular web of streets with a various centered nucleus. By the 18th century Istanbul, under Westernisation, continued to expand its limits. The walled city which covered the historical peninsula kept its boundaries, meanwhile Galata, Uskudar were expanding which were satellite settlements old as much as Istanbul. The city continued to grow linearly on the shores of Golden Horn together and Bosphorous together with the old villages such as Ortakoy, Kurucesme, Kuzguncuk, Istinye (Kuban, 1996). Arrived in the 19th century, with industrialization, on shores of Golden Horn's and Tophane's new factories, military barracks, and railroads proliferated turning the waterfronts into industrial areas. By the end of the 19th century, only Ayaspasa, Pangaltı, Osmanbey-Bomonti, Nisantasi, Sisli and Macka were the quarters along the hills that faced north, which had scattered buildings with a thin population. With the establishment of Turkish Republic, Istanbul continued to grow and transform under modern urbanism. Until 1923, there were existing two distinct urban patterns in the two sides of Golden Horn; apartments and commercial units in Galata area and highly populated residential units, mosques and social complexes in the old core of the city (Kubat and Kurkcuoglu, 2014). Up until this time, the city could be considered relatively small in size, and distant from the urban center of Eminonu-Karakoy, which was about 30 km (Arslan,1974). The accelerated growth took place from the 1950s due to uncontrolled immigration and industrialization. The new-comers from Anatolia occupied the historical quarters and built new neighborhoods on the outskirts of the old city. From this period and so on the city expanded rapidly outside its nucleus with brand new neighborhood patterns and its historical neighborhoods lost significantly their value. Istanbul's physical environment, therefore, should be read as a mélange of different cultures and political powers. Acknowledging different periods of urban growth of the territory which gave shape to its divergent urban patterns is crucial to comprehend the ongoing gentrification patterns of the city.

Contemporary Gentrification as an Urban Strategy

Gentrification phenomenon has expressly a spatial and temporal heterogeneity within the city of Istanbul since the early1980s. Its latest forms are strictly associated with the accelerated structural shift in Istanbul under neo-liberal policies adopted intensively by the governments since last three decades. The aim of the new government was to turn the old Istanbul, previously characterized by manufacturing, into a global city, an arena for the service, tourism and finance sectors by attracting big national and international investors (Gul, 2017) following a worldwide incrementing trend. Consequently, different deteriorated parts of the city have been identified as new redevelopment areas in order to make room for new emerging sectors. Under these dynamics, the inner-cities of Istanbul started to experience, as many examples in the world, a shift in their identity. Gentrification, as a remarkable type of transformation, has become one of the main strategies adopted by municipalities, (both as state-determined or market-determined), to transform rapidly some problematic portions of the cities (Islam and Sakizlioglu, 2015). Hence, These processes are not only upgrading the physical and social environment of the areas but is being used as the main mechanism to keep alive the real-estate sector and maintain the economic growth of the overall city. State-intervention seems to incentivize the free-markets mechanisms to gentrify some strategically identified areas. Among current transformation areas, waterfront sections are one of the targeted locations, as they were the old core of manufacture and industry which lost its importance with the new vision of the city. Galataport project is an important regeneration project launched by the government, under this framework, on the European core of the city which resulted expressly the gentrification of the adjacent neighborhood called Karakoy over the last ten years.

The case study: Karakoy Neighborhood

Karakoy is located on the European side of Istanbul, on the east of the historical peninsula, where Golden Horn intersects with Bosphorus. Since the early byzantine period, the area has been a trade center for centuries as an important harbor district. The area formed inside the skirts of Galata which used to be a Greek settlement in front of Byzantion, called Sycia, and by the beginning of the 13th century with the Genoese settlers moving to area it became Galata, an independent city-state, with its own city walls (Kuban, 1996). The area was shaped, starting from the 5th century, in accordance with the topography and its harbor function, thus taking on the typical characteristics of a Mediterranean city. An irregular grid system that contained parallel main axes to the seashore can be observed, in which the narrow streets form the grid structure. During the Ottoman period, the area continues to evolve, disintegrating from the traditional wooden texture of peninsula, with trade and harbor functions, rather than residential, under intense influence of Genoese and European culture within a cosmopolitan identity (Çelik, 2000). By the 17th century, the Karaköy-Tophane seafront was the main destination for European ships. At the beginning of the 20th century in the Ottoman capital when the coastline extending from Karakoy to Tophane and Kabatas was transformed into commercial rhythm and Karakoy became an important business center. Banks and other buildings dealing with international trade focused on Karakoy, which had easy access to the port (Celik, 2000). With passage to Turkish republic, during the first decades, when most of the non-Muslim minorities left the city, Karakoy experienced a large number of property shift and the unoccupied properties, which became housing for immigrants and lower class workers alike later on (Schuitema, 2013). Under the modernization developments, known as Mendereses demolitions, roads were built at the expense of historical buildings in Kemarlati and Maliye streets, and the density of multiple story concrete buildings in the area was increased. The value of the district vanished in the late 20th century, in the last two decades, where commercial port function was eliminated from the neighborhood due to its inadequate capacity and the neighborhood started to depreciate accordingly.

Karakoy's Latest Transformation

Reached the 21st century, Karakoy was still keeping with it trade-business-commercial identity, but as a lower-class commercial neighborhood, occupied predominantly by mechanical, electronic and plumbing part vendors. During the last years, Karakoy's charm in the eye of the investors grew dramatically and the urban land experienced an engrossment by service, entertainment, and tourism sectors (Acar et al., 2015). The given privilege to the new sector's entrepreneurs, the existing small-medium businesses started to disappear. The precursor of the upcoming change was the decision made by Council of Ministers, in 1994, where the area surrounding Karakoy-Tophane-Salipazari declared as the new tourism center (TMMOB Mimarlar Odasi Istanbul Buyukkent Subesi, 2005). The boundaries indicated were the coastal section starting from the Maritime Bank and passenger lounge buildings up to the parking garage of Mimar Sinan University, including the warehouses in Salıpazari (Cumhuriyet Arsivi, 1995). Still, the catalyzer that resulted in the gentrification of the area was the tender held in 2005 for the privatization and redevelopment of the obsolete port in Salipazari through a large project called Galataport. The aim of the project is to transform the waterfront into a center of cruise ship tourism and entertainment destination by upgrading the built and social environment. The on-going project implicates the destruction of warehouses in order to create the new terminal with related facilities as hotels, retails, offices, cultural centers, and further recreational activities over the course of thousand-meter long coastline. The construction of the project began by 2015 by Dogus Holding and is supposed to be completed by the end of 2020. Consequently, the launch of the project brought a lot of attention to the deteriorated Karakoy and a market-determined gentrification process was triggered naturally. In the eye of the investors, Karakoy, thanks to the strength of its location, became an important point that could accommodate further service functions for the expected tourist load. In addition, the existing condition of the built-environment

and ownerships was favoring the rent-gap creation. Accordingly, the value of the area has risen; the real-estate prices have gone up and the area started to experience what can be called 'tourism gentrification' (Gotham, 2005) with some of its idiocratic characters. The area, since then, is exposed to a large proliferation of new amenities such as restaurants, boutiques, hotels converted from small trade business. Still, it should be kept in mind that the commercial identity is not new to the neighborhood, but today, the type of commercial activities gained a new ground by contemporary tourism flows.

Assessment of Gentrification in the Area Through Urban Elements

This work partially aims to experiment novice way to read and measure the gentrification phenomenon that is taking place now in Karakoy neighborhood. The elements of urban form and land use were used to demonstrate and testify the ongoing urban trends and the change in the defined area. The area of study comprises three municipal neighborhood boundaries which are Kemankes Karamustafa Pasa, Mueyyetzade and Hacimimi. Karakoy boundaries are defined by Kemeralti Street on the north-east, the coastline on the south-west and Kilic Ali Pasa Street on the west until the recently demolished entrepots of the port in the adjacent neighborhood. The neighborhood consists of compact urban blocks formed by attached units along the axes together with some detached monumental architecture and warehouses at the shore. The general network of building plots and streets traces back to the Genovese period where the main axes and the trace of the city walls could be revealed. Meanwhile, little building types left from the early time of the area, most of the buildings are examples of late 19. and early 20. Century Western style from the Ottoman period and late 20. Century modern structures. A multilayered urban tissue can be observed in the area together with some Byzantine, classical Ottoman and Republican architectural examples (Okyay et al., 2017). A comparative mapping analysis is performed starting from the ground floor land use analysis conducted by Istanbul Beyoglu Municipality in 2008 and the field survey conducted by the author. In the map elaborated from the municipal ground floor land use plan, the major part of the buildings (indicated with blue color in Figure 1) is indicated with commercial use. These commercial buildings are comprised of electrical-mechanical goods retail and manufacturing-related equipment stores. Additionally, religious structures alongside warehouses and manufacturing workshops can be found in a large part of the region. The buildings that are indicated with violet are for administration uses. At the intersection of Kemankes Street and Finans Street, a multi-story parking lot for vehicles is located which occupies an important portion of the area. As can be seen from the map (Fig.1), elaborated starting from the field survey held in 2019, greater part of the old commercial spaces are transformed into new service spaces dominated by hotels, cafes, restaurants, and boutiques. The ongoing construction activities, at the time of the survey, are as well mapped which stresses the fact that transformation of the area is still ongoing and gentrification of the area is still not completed yet. Moreover, the land-use shift is accompanied by some minor typological changes. From the analysis, six important typological changes can be unearthed. In all the six cases, the smaller attached units are unified in order to create a bigger unit, in some cases, a courtyard is created. Surely, the traditional typologies present in the area are no more adequate to host new services neither qualitatively nor quantitatively. This is the case for example of hotel facilities that need larger surfaces to run their function. While local cafes and boutiques can be more handily adaptable on the previous narrow ground floor plan with some minor changes in the interior organization. Furthermore, if we examine the owner of the enlarged typologies, it is noticed abounding prepotency of important international and national players such as; Starbucks, Novohotel, Marriot, HSBC, Nabu and so on. These are powerful hotel chains, coffee chains, banks or holdings recognized nation/world wide. Within these analyses, it seems that typological transformations are occurring in the form of unification and densification only with the presence of strong international or national mechanisms. Finally, in the area, it is observed that general urban layout remains the same, nevertheless, single buildings are being demolished, modified and unified in order to create larger typologies. Over the last eleven years, it is evident that

the transformation of the old buildings' functions is conducted through the gentrification procedure. A significant change in the overall structure of the urban tissue is not observed, while a remarkable change in the use of space can be laid out.

Conclusion

Today Istanbul's inner neighbourhoods are exposed to increasing interest and conflict. They are becoming a point of accumulation by getting wider and easily attainable territory, whereas they load up-to-date functions and contrast to the previous local identity. Introduction of global flows, in particular, powerful free-market players into the local context seems to speed up the process of change and particularly boost the typological transformations. Karakoy, a historic inner-city, is an emblematic example used to reveal the neighborhood pattern transformations in Istanbul due to tourism, culture, and entertainment (consumption) sectors which have become one of the latest driving forces of contemporary gentrification in global cities. The case study, have been analyzed through a comparative mapping method which shows before and after changes in the area. The preliminary results of the research sustain that gentrification in the area occurs mainly as land-use change accompanied by minor typological transformations and densification processes. This investigation wants to give a hint on what currently the inner cities of large global cities are exposed to. Nevertheless, every territory should be understood within its unique socio-spatial urban context. In the case of Istanbul, the mentioned shift in the usage of city's spaces and the fabric of everyday life, as a consequence of spatial concentration cultural globalization, is procreating the fifth stratification of the aging city. Moreover, this study, apart from being a contribution for documenting the change within a temporal dimension, through the Turkish context, wants to show the importance of adopting urban morphology as a tool for revealing and measuring non-spatial dynamics through a physical built environment.

2008

Commerce

Storage
Manufacturing

Central
Government

Cult

Existing

Source: Elaborated from land
use map of Istanbul Beyoglu
Municipality

2019

Commerce
Food
Boutique
Office

Hotel

Central
Government

Cult

Existing
Under
construction

Source: Elaborated from
land use analysis conducted
by the author

Figure 1. Ground-floor land use comparison between 2008 and 2019.

2008

2019

Figure 2. Modified units.

2008

2019

Commerce
Hotel
Food
Office
Administration

HSBC   STARBUCKS   nabu   Gal ata s Hotel   Marriott   NOVOTEL   DOĞUŞ
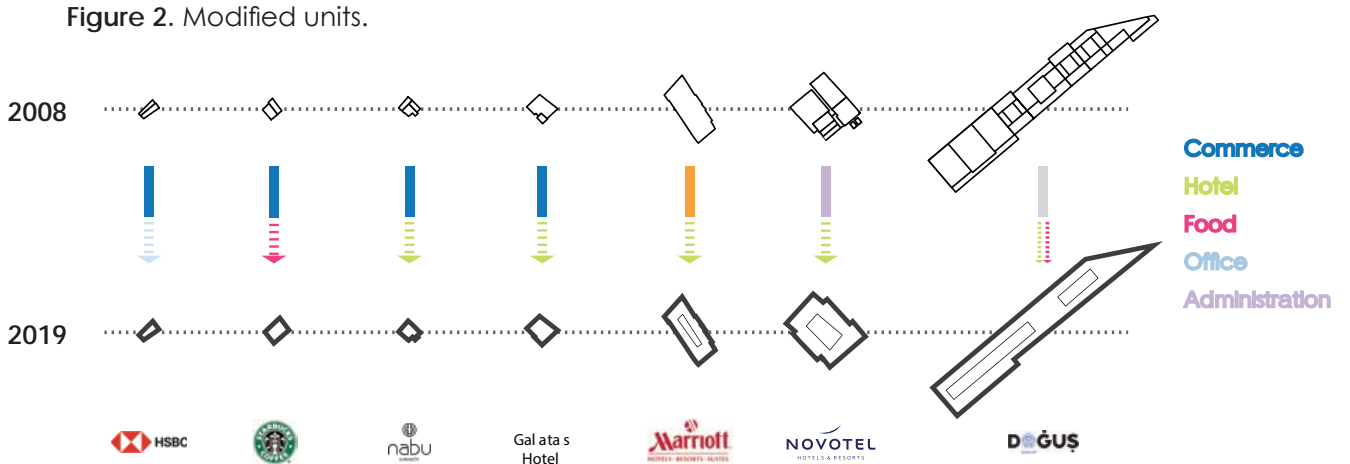
Figure 3. Agents of modification.

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The urban redevelopment project of San Lorenzo District in Rome

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Keywords: *urban design, redevelopment, architecture, regeneration*

Abstract

The district of San Lorenzo in Rome, so called because of its proximity to the basilica of the same name, has a historical fabric and particular morphological and environmental characteristics. Built on farmland belonging to the bourgeoisie at the end of the 1800s, it attracted migrants who saw a certainty of work in the thriving construction sector. This created the need to build cheap high-density dwellings for the working class, craftsmen and the people, taking advan¬tage of the absence, until 1887, of a city building regulation and therefore, building without any planning.

In 1909 the Sanjust Plan provides for the completion but does not heal the degraded building fabric. During the Great War the war industry implemented the development of urban transport by rail and the urbanization of the land of Casal Bruciato transformed San Lorenzo from a suburban border into a transition area between the intramural city and the periphery. In 1962 the Master Plan provides for the construction of the East Tan¬genziale and excludes it from investments. Today the social and structural conditions, the high building density with reduced road sections, the organic lack of greenery and services require a reorganization process.

The Urban Project of the municipality of 2006 identifies areas of valorisation, limited by building permeability and inhomogeneity. The Aurelian Walls, the Verano cemetery, the University City and the Rome Termini railway are strengths in the regeneration of the neighborhood that provides a connection to the areas of valorisation. The areas of inter¬vention are: C10 - via de Lollis; C11 - Verano; D - bombed buildings; B7 - borghetto dei Lucani; C4 - Atac deposit.

Introduction

The district of San Lorenzo in Rome, so called because of its proximity to the basilica of the same name, has a historical fabric and particular morphological and environmental characteristics.

In 1909 the Sanjust Plan provides for the completion but does not heal the degraded building fabric. During the Great War the war industry implemented the development of urban transport by rail and the urbanization of the land of Casal Bruciato transformed San Lorenzo from a suburban border into a transition area between the intramural city and the periphery. In 1962 the Master Plan provides for the construction of the East Tan¬genziale and excludes it from investments. Today the social and structural conditions, the high building density with reduced road sections, the organic lack of greenery and services require a reorganization process.

Through an historical and a morpho-typological approach, this paper highlights strengths and weaknesses of the Roman district. The primary objective of the redevelopment is the drafting of a unitary structure that does not alter the characteristics of the neighborhood but instead identifies the potential to reconvert unresolved areas with an urban design that welcomes new functions and relocates the existing activities in appropriate structures.

The projects we present are the result of an overall analysis of the neighborhood, which started with the study of the San Lorenzo redevelopment plan, launched by the Capitoline Admin in 2006.

Historical Evolution
Late 19th century

Prior to 1870, the area where the community of San Lorenzo was built, so named for its proximity to the basilica of the same name - located outside the Aurelian Walls - consisted mainly of land cultivated with vineyards and orchards, with some important pre-existences from Roman times.

An evolution of the neighborhood took place between 1884 and 1888 following the unification of the Kingdom of Italy, with a great building fever and without any social and hygienic criteria to guide the construction of new buildings. The first settlements were by immigrants and the working class, attracted to the area by the demand for artisanal labor due to the presence of the monumental cemetery of Verano (1859-1878), and by the imminent construction of the Rome-Tivoli railway (1879). The new residents, artisan workers, marble workers, glaziers and blacksmiths, confirm their vocation as a popular neighborhood.

At the basis of the construction of San Lorenzo, which took place without any planning, there was therefore the need to build popular housing at low prices for workers and artisans, taking advantage of the absence, until 1887, of a city building regulation.

The construction of the neighborhood took place at a time when no social and hygienic criteria drove the new buildings. The sewage network was built later; building lots were built with poor high-density housing materials (balcony houses), where a large population was continuously exposed to the risk of contracting serious epidemics.

Towards the new millennium the consolidation of the neighborhood becomes definitive.

At the beginning of the twentieth century San Lorenzo was a compact workers' nucleus. The Rome Brewery was built in 1902 and the Pastificio Cerere in 1905, elements that contributed to strengthening the social characterization.

The Church developed a robust welfare network, an oratory in via dei Campani and the Church of the Immaculate Conception, with the specific purpose of becoming a place for people to aggregate.

In 1907 Maria Montessori chose San Lorenzo to open the first Children's House and intervene in favor of the poorest.

In 1909 the neighborhood became part of the Sanjust plan, which did not reorganize the chaos of the city, but only provided for its completion.

Meanwhile, the Roman Institute for stable assets intervenes with a partial redevelopment of the living spaces, summarized in a report published in 1910, building bathrooms and kitchens where more families shared a single room.

The Great War

Sections of the popular, republican and socialist party are born in the neighborhood. The socialist section of Via dei Sardi, founded in 1914, is was particularly active and carried out initiatives aimed above all at the socio-cultural development of San Lorenzo.

The Great War caused a deterioration in living standards, increasing the cost of food and the basic necessities. The call to arms of men accelerated the use of women in crafts and transport.

The war industry implemented the freight yard activity and the development of urban rail transport. The urbanization of the land of Casal Bruciato and Portonaccio transformed San Lorenzo from a suburban border into a transition area between the intramural city and the peripheral expansion.

The State Railways carried out the main residential construction works in the area north of via Tiburtina; building, between 1920 and 1925, a complex of economic houses for railway workers near Piazza dei Siculi.

The early 1920s were characterized by reactions to the early acts of fascist squads and San Lorenzo was definitively configured as a proletarian district with a socialist political orientation. The first movements of people (communists, socialists, anarchists) opposing the fascist regime spontaneously arose in 1922 with episodes of reaction and resistance to the penetration of the fascists in the neighborhood.

At the beginning of the 1930s, marked by an increase in housing costs, a reduction in wages and unemployment, the living conditions of the lower classes severely deteriorated.

On the other hand, there is an enrichment of the urban-architectural face and large artisans become small industries. The fascists entered San Lorenzo only in 1942, with the march on Rome.

The bombing of the neighborhood

On July 19, 1943, Rome was attacked by US bombers and San Lorenzo was the hardest hit neighborhood, almost completely razed to the ground. The Piazzale del Verano and the adjacent Piazzale San Lorenzo were destroyed, thus strengthening the separation of the district from the rest of the city.

The greatest devastations are concentrated in the triangle formed by Piazzale Sisto V, Piazzale San Lorenzo, Piazza Porta Maggiore.

The San Lorenzo district was a place of rebellion and as the first district of Rome bombed, experienced a worsening of living conditions, just as a counterattack to its reactionary nature. The liberation of 1944 highlights on the one hand the depopulation caused by workers looking for work in other areas of Rome and on the other an overcrowded housing in areas that remained intact after the war. To date only four buildings remain to testify to this event, showing the bombing left gaps of incompleteness in the reconstruction of the buildings themselves.

On 5 June 1944 San Lorenzo was freed after months of occupation and the seats of the anti-fascist parties reopened.

There was a new wave of immigration with families from southern Italy looking for work on the State Railways. The reconstruction of the district, however, proceeds slowly and many moved to other neighborhoods or return to their countries of origin.

The sewage networks were that of the early twentieth century, 50% of homes are were in poor condition and production activities decrease by 30%, as many factories are transferred. The damage from the bombing of 1943 added to the already unresolved levels of crowding of houses and the need to renovate and redevelop the neighborhood from an urban point of view.

The expansion of the "La Sapienza University of Rome" led to the acquisition of several buildings located in the neighborhood and the increase in the presence of off-site stu-

dents. These phenomena implied an increase in rents and the removal of housing for the inhabitants of the area.

From the second half of the 1900s to Today

In the 1962 Regulatory Plan, San Lorenzo is basically excluded from the consolidation and investment processes up to the Multiannual Plan which defines the neighborhood as a 'recovery area'.

The construction of the buildings of Child Neuropsychiatry in Via dei Reti and of a new vehicular hub the Tangenziale Est, a double rapid sliding system that runs through the neighborhood, is planned, but no restoration or enhancement plan until 1979. With this plan the Municipality of Rome undertakes to maintain the residential and productive-artisan connotation of the neighborhood.

The Tangenziale Est, now partly demolished, becomes a landmark, an element of recognition of the neighborhood. Starting from the 1980s, there is a trend towards artistic experimentation, which is still evident today with the regeneration of spaces used for cultural environments such as ex Vetrerie Sciarra, ex Pastificio Cerere and ex Cinema Palazzo.

The markedly artisan and proletarian connotation of the neighborhood becomes inspiration for artistic experimentation. The neighborhood is a hotbed of social cooperatives, welfare, voluntary and professional initiatives, which arise from the intent of the population to get involved in common and shared projects.

The tertiary sector becomes a fundamental sector in the neighborhood economy and the number of workers employed in the nearby Policlinico Umberto I, in public transport services and especially in the "La Sapienza" University of Rome, is more substantial.

The influences of socialist realities, artistic experimentation and the influence of the university world are tangible. From an architectural point of view, the consequences of the bombings that destroyed the neighborhood are still evident. Industrial architecture is being redeveloped and destined for new uses and in favor of new university locations: the former Cerere pasta factory transformed into a center of contemporary art, the Sciarra glassworks, the former postal sorting center and the Wuhrer brewery sold to Sapienza.

San Lorenzo becomes a place of a culture that marries the ideals of freedom and brotherhood, shared and present in the community.

Analysis

Morphological Analysis

Following the historical analysis, it is necessary to understand the position of the San Lorenzo district, bounded by strong borders and pressures such as the University City, which almost causes a compression towards the inhabited area, the railroad which creates a clear insurmountable barrier, and the Verano cemetery that defines a very vast and historically border.

The neighborhood is surrounded by large service areas affecting the city and the territory: Termini Station, the Freight Terminal, the General Hospital, the National Library, the CNR, the Sapienza University of Rome and the Verano.

The duality of the elevated ring road, now partly demolished, which serves as a link between the residential areas to the east and south east of Rome, is evident, but at the same time separates and isolates the neighborhood itself.

San Lorenzo is a central district, close to the traditional historic center, with hinge functions between the paths of Viale della Regina and Porta Maggiore.

Given these conditions, it can be seen that there have been three types of transformations taking place which have resulted in the expulsion of the popular classes of residents to peripheral areas, thus altering the social fabric.

The first transformation derives from the constant pressure of the large real estate companies that proceed with a tendency to concentrate properties, moving the tenant away by imposing different forms of payment. These companies carry out minor conservative restorations.

The second type of transformation concerns a possible process of private outsourcing,

which has not occurred over time as a determining factor.

The third type of transformation is consequent to the contiguous presence of the Sapienza, University of Rome, which is characterized in two aspects:

- the residence of off-site students allows on the one hand an increase in the low income of the owners, preventing a process of outsourcing, on the other increases the cost of rents per apartment;

- the progressive purchase of areas and building structures removed from the use of the neighborhood.

The service system is composed of functions related to transport, such as marginal industrial centers, small places of worship and various structures used for teaching or belonging to the Sapienza University.

The residential fabric system is characterized by complexes in line having a court or balcony to villas with front property.

The industrial centers are instead characterized by settlement rules out of context, isolated twentieth century buildings and post unitary buildings.

The infrastructure system is characterized by the presence of the railway, which connects Termini Station with the rest of the city and the country, and the neighboring metropolitan lines of the Policlinico, San Giovanni, Pigneto and Lodi which further determine their potential.

The road system includes the Eastern ring road, primary roads such as Via Tiburtina, Cesare de Lollis, Piazzale del Verano and Piazza di Porta Maggiore, and secondary roads.

Typological Analysis

The urban fabric is mainly composed of a building fabric (residential and services) and a consistent industrial fabric.

The differences are evident with the neighborhoods built in the same period in other parts of Rome. While the road network and building lots are similar, the differentiations concern:

- the dimensions of the neighborhood plan, which configures a high building density with reduced road sections;

- the organic shortage of greenery and services;

- the lack of urban decoration elements.

The environmental system is lacking in both private and public greenery.

With regard to housing, the comparative analysis of plants among building blocks discovers all the typological differences, which can be summarized as:

- greater covered area of the lot, with reduction of the role of the courtyard to a simple air well;

- cut of the apartments reduced to a minimum with prevalent typology of two rooms without services;

- reduced number of stairs which in an extreme case reach a staircase for thirty apartments on each floor.

This reveals the great contradiction of the city of the 19th century, which hides social differences and the differentiated use of the city behind the facades, while offering apparent starting conditions that are the same for everyone, given by the uniform texture of the layout and the facade configurations.

The typological characteristics of the residences, whether public or private, reflect the more or less clear conscience of the builders and designers of the role of the neighborhood and its social destination: the popular character of the houses has led to an adaptation to the minimum cultural and technical levels of some models of the bourgeois block on the one hand and the "on-line" layout of public housing on the other.

Three typological structures can therefore be identified in San Lorenzo:

- the bourgeois block type, which derives from those built in the neighborhoods for the middle-upper classes;

- the online type, prevalent in economic or cooperative public building;

- the balcony type, chosen for the working classes and artisans.

Experimental Design

Today San Lorenzo is surrounded by important and protagonist centralities such as Vera-

no, the University City, the Roma Termini railway line, the Aurelian Walls and Porta Maggiore that isolate the neighborhood, make the relationship with the immediate surrounding difficult and compressed on the edges.

With the Rome Municipal Urban Project in 2006, areas of enhancement have been identified, highly limited from the point of view of permeability, building inhomogeneity, equipped areas and urban green areas. Historical elements such as the Aurelian Walls and the Verano cemetery are strengths in the regeneration of the neighborhood which provides for an overall connection of all areas, in particular the areas of enhancement.

The areas of enhancement for the Urban Project as defined by the Capitoline Admin are four. Those having the letter B are i.e. "fabrics, buildings and open spaces, characterized by inconsistencies and imbalances of a morphological and functional type ...", where we find the area B7, which includes the Scalo San Lorenzo, via dei Lucani and via di Porta Labicana, and those with the letter C or "brownfields and mainly non-residential settlements".

They are part of this the area C4, which affects the Scalo San Lorenzo, the Tangenziale Est and Porta Maggiore; the Area C10 with via Tiburtina and via Cesare de Lollis; the C11 area with the Verano square and Largo Passamonti.

The strategies defined in the urban project intervention sub-areas therefore envisage new elements of reconnection with the neighboring neighborhoods starting from the insertion of a cycle circuit along the vehicular roads, to allow movement with gentle mobility, which is also foreseen in the raised green corridor which will become the new East Ring Road.

Furthermore, also close to the Aurelian walls, a redefinition of the space pertaining to the historical monument is expected, by inserting a new linear park.

In the general project masterplan there are five areas of intervention on which the project focuses:

- Area C10 (via de Lollis): it lies between the university city and the neighborhood and stands as an urban barrier in a state of severe degradation. Inside there are heterogeneous activities that have led to a blockage of the lot that is difficult to cross.

- Area C11 (Verano): the first sub-areas C11a concerns the Piazzale del Verano and is currently configured as a driveway and parking area. The built part is uneven due to the presence of sheds that prevent connection with the context. The second sub-area C11b focuses on Largo Passamonti, an open space occupied by ring road junctions and local roads; part of the area is occupied by parking.

- Area D (bombed buildings): empty space characterized by the presence of buildings that were bombed during the war and never recovered. The mesh is regular with courtyard houses and balcony, of architectural and historical importance.

- Area B7 (Borghetto dei Lucani): large urban void currently occupied by disused industrial and artisan warehouses. The elevation of a single floor contributes to the perception of urban emptiness despite the occupation of the land. Hence the need for redevelopment with reference to the resources of the Aurelian Walls and the artifact of Largo Talamo.

- Area C4 (Atac depot): area characterized by road and infrastructure junctions and separation elements. The beam of the tracks towards Termini station and the railway areas towards Tiburtina station, connected by the elevated, are the cause of atmospheric, acoustic and visual pollution. The Aurelian Walls and the aqueduct represent important references for the redevelopment.

For the design objectives of the individual areas see, in C10, a new swimming complex, in C11 the redevelopment of the Piazzale del Verano, in the out-of-scope sphere, attention goes to the recovery of bombed buildings, to complete the urban voids. In the area b7, the reconfiguration of the Borghetto dei Lucani is expected, and finally in C4 the regeneration of the Atac remittance.

The studio compares the current state with the design strategies. We can note that there is a barrier that creates difficulties in crossing the lot transversely, there are differentiated activities and discontinuous fronts; the regeneration target sees the opening of the lot with a cross connection that reconnects the neighborhood; the design of a cycle

path between the neighborhood and the university; the demolition and reconstruction of the building at the head; finally, the design of a swimming complex is planned to act as a mending of the neighborhood and that will be an aggregation center for citizens.

The C11 area is characterized by open spaces mostly driveways and parking areas and by a lack of homogeneity of functions and buildings. There are compact fronts that prevent connection with the rest of the neighborhood. Moreover, the Piazzale del Verano is in a totally degraded state.

The regeneration objectives of the Piazzale del Verano provide for the arrangement of the greenery in front of the cemetery, a homogeneous demolition and reconstruction of the buildings with the maintenance of current craft activities and a new uniform system equipped with an access filter. Lastly, the reconfiguration of the road section is planned.

This is a space characterized by the voids from the bombings of '43 and the consequent non-homogeneous fronts, with disused industrial and artisan warehouses; there is a low elevation of the buildings together with a substantial occupation of the land. The presence of historical artifacts such as the walls and the large thalamus artifact are to be preserved.

The reconfiguration of the area includes green areas to be connected to the ends of the lot, together with the design of the cycle path; a redesign of the buildings that is more coherent with the context, with the new destination for offices and support functions for them. Furthermore, the emergence of Largo Talamo is expected.

The last area, where the Atac garage is located, is characterized by a complex relationship between a bundle of tracks that connects with the nearby Termini and Tiburtina Stations, which determines a separation barrier.

The design strategy involves the recovery of the Atac artefact given its historical importance, with the preservation of the peculiar characteristics of the building related to its current function; a cycle path design that can reconnect the area with the San Lorenzo district.

Conclusion

San Lorenzo District is located in a central position within the Municipality of Rome, between well-structured and consolidated neighborhoods, which thus accentuate its connotation of an isolated neighborhood, which has characterized it since the beginning of its expansion. The history of the neighborhood shows how this arises from successive settlements of labor migrants. This created the need to build cheap high-density dwellings for the working class, craftsmen and the people, taking advan¬tage of the absence, until 1887, of a city building regulation and therefore, building without any planning.

The Urban Project of the municipality of 2006 identifies areas of valorisation, limited by building permeability and inhomogeneity. The Aurelian Walls, the Verano cemetery, the University City and the Rome Termini railway are strengths in the regeneration of the neighborhood that provides a connection to -the areas of valorisation. The areas of inter¬vention are: C10 - via de Lollis; C11 - Verano; D - bombed buildings; B7 - borghetto dei Lucani; C4 - Atac deposit.

The objectives see a recovery of buildings of historical importance thanks to a path that can connect them; a cycle path design and a reconfiguration of open spaces, together with the introduction of new functions for the community.

Figure 1. Residential typologies: in-line, balcony, courtyard, terraced, edited by L.Cecchetti, F. Cuppoletti, E. Dubini, F. Lucci and G. Mece.

Figure 2. Areas of enhancement of the Urban Project, edited by L.Cecchetti, F. Cuppo-letti, E. Dubini, F. Lucci and G. Mece.

Figure 3. San Lorenzo District (orthophoto, Google Earth).

Figure 4. Masterplan, edited by L.Cecchetti, F. Cuppoletti, E. Dubini, F. Lucci and G. Mece.

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Urban Morphological Forms of Informal Areas in Tirana; Strategies of Intervention.

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Abstract

The last 30 years have been accompanied by many changes in the country including those of a territorial development character in Albania. The biggest interventions after the fall of the communist regime, result to have been done in the most important cities. In the new conditions of the market economy, there was an intense demographic movement toward these areas, especially in the Durrës - Tirana area, mostly due to their economic potential. Being not ready to handle the situation, the state failed in the control of demographic movement, and the territory. The informality was developed very fast and was a widespread phenomenon. There were several morphological urban forms of informality developed within the existing city fabric, but also the new ones occupying new territories. Nowadays, these kinds of developments, spontaneously organized, have transformed many ex-agricultural and ex-natural spaces into a build environment. These areas do contain many problems, mostly due to the absence of different services, infrastructure, and lack of integration with the rest of the city. After many years, not much has been done for these settlements, which are legalized by now, and are "formally" an integral part of the urban area. This study aims to define the areas of informal settlements, define their morphological urban form, the morphology of the territory where located, and file their characteristics. On this important background, possible scenarios of intervention would be developed with the only scope, that of emerging solutions for the regeneration and the integration of such areas of the capital city.

Introduction

Informal Settlement is a phenomenon encountered in many countries nowadays, especially in developing countries. Each day it gets more and more important in the global challenges as it is considered non-appropriate living conditions, and it is evaluated that 25% of the world population is living is such structures considering the lack of many conditions and services. Being in a transition period from the late '80s, informality has found the appropriate conditions in developing in Albania as well, appearing mostly in the vicinity of the capital as the main economic pole of the country. The informality has been rapid with no obstacles during these last 30 years and it can be measured by the change of the footprint of the urbanized area versus previews natural and semi-natural spaces. As it is previously described in our studies, it is a phenomenon appeared at the late '80s, after the fall of the regime, change of the socio-economic situation and demographic movements towards the most developed and prosperous parts of the country which results to the today city footprint and its typo - morphologies.

This whole process of informal development is taken in consideration by Accademia but has been limited in theoretical description of the urban footprint and its changes in time, sometimes by narrating a phenomenon, sometimes in terms of identification of typologies being developed which can be categorized in two main forms: (1) Informality inside the existing city fabric; (2) Informality being developed at the peri-urban area of the city or the city fringe, while this study is focused in particular to the second form of informality, that encountered in the edge of Tirana and the understanding of its morphology and try to give a better understanding of typo - morphology of these areas. Being of a great extent, these areas have created a continuous urban fabric which results in urban sprawl. The previews city of Tirana, its satellite neighborhoods and other nearby rural settlements such as Babrru, Paskuqan, Yzberisht, Vaqarr, Shkozë, Linzë, Kamzë, and many others results to be under the same footprint with no visual understanding of the change not only of the administrative units but also of the character of the environment between urban, peri-urban and rural. As it might easily be understood, the loss of identity of places is one of the main problems of these areas, as they tend to repeat themselves in different parts of the city almost with similar rhythm and philosophy. Of course, the loss of ty of the place is not the only problem encountered in these areas. The continuous urban fabric of self - developed residential buildings is associated also with the negative impact as per the quality of life on the areas and lack of infrastructure and public services. Lately, due to a major earthquake (26th November, 2019) it was in the area, another very important issue comes to the surface, the stability of these structures in other similar events. Due to the complexity especially this last topic has, it cannot be evaluated in this particular article.

Nowadays, we can count a few developments and interventions as per the informal areas of Tirana. Being large- scale development and taking into consideration the investment and stability of the buildings, it has been difficult to take a decision on the future of the areas as one socio-economic problem shouldn't lead to another bigger social problem. Saying that the tabula rasa approach has never been an option. The informal areas are by now component areas of the city footprint. The involved actors and institutions have been working on solving the main of the type of informality developed such as the property issue by an intense legalization process and financial compensation of the real property owners. There have been also some developments in implementing an appropriate infrastructure to the areas such as roads and sidewalks.

With this background, it is important to emphasize that only in 2016, Tirana has completed finally its Regulatory Plan after 27 years of non-planned development. Known in today's legislation known as General Local Plan, there have been introduced some very interesting strategies which tent to (1) Conserve the natural and semi-natural areas by controlling the urban sprawl. This is achieved by the implementation of a Perimetral Park (known as Metrobosco); (3) Further develop the natural and seminatural environments; (4) Add the public services by the implementation of schools; (5) Develop poles in the city by the process of transformation. So far, no clear strategy of further development of informal areas is being developed and that is why the main question is raised - What would be the future of these areas and their communities.

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& and
CITY REGENERATION | design tools

Method

As an answer to these questions, there have been a few individual proposals such as the ones found in 2004, Tirana Metropolis and in 2017, Tirana, the informal city and its public space where temptations of interventions in these areas are being proposed. In this study, we would like to further theoretically develop a methodology of the study and develop later strategies of interventions in the areas. The following steps, are considered as very important to the understanding and file the morphology and typo-morphology of the informal areas in Tirana:

Morphology of the territory - The understanding of how the city has developed through the years it's a footprint, and how the informal areas do communicate with the topography is an important step to understand and classify different characteristics of these settlements;

Background and History of the territory - The understanding of the previews functioning and land use of these areas is part of their identity and therefore important to be part of the studying process as they might lead to the genesis and the transformation of the urban fabric;

Strategic Projects - these are important projects which will be implemented in the future into the existing fabric. As the scope of our work is to precede the solutions as per these areas and to prevent any mistake for the future, part of the study is the scenarios proposed by the General Local Plan, Tirana 2030. The land use proposed for such areas is another important part of understanding the strategies of interventions by local authorities the next 10 years to come;

Case studies - In the above context, by identifying the differences and particularities of the territory, fabric, and informal areas themselves, 9 case studies are chosen. They do represent particular areas of 800m x 800m not only in different edges of the city, but they do represent different territories and/or structures of urban morphological form. The area of 800m x 800m represents a grid we have used in all our studies which considers the ratio of 400m of a walking distance as the ratio for fulfilling the most important activities in an urban area.

Understand the characteristics of each urban morphological characteristics of the samples - Understanding the characteristics of the buildings themselves, of space and the environment around them, but also the of the different groups of buildings, their relation with adjacent ones, but also the presence of other services rather than living, it is mainly the goal of this particular study. By analyzing the above-mentioned elements, we can arrive at a better picture of not only the physical space qualities but also, we shall be able to understand and interpret the lifestyle of these environments. Maps are being developed, a few visits and google is used for concluding.

Proposals of strategies for possible interventions - The methods of interventions could be many. In our studies, including this one, we're trying to understand if landscape could be a potential and possible intervention in the area.

Results

General results from reading the territory - It is very obvious that the informal areas tend to develop more in the flat topography rather than the hilly ones. This could be easily evaluated by the major development they have had in this type of territory. There are also developments on the hills, adjacent to previews rural settlements, but still at a lower scale. From the maps and orthophotos of earlier years such as the one of 1994, 2003, 2007, etc., it is very obvious that the informality has been developed partially in agricultural land (in the flat territory), greenhouses, olive groves and vineyards (these last two in the hilly territory), partially in natural land covered with grass or Mediterranean vertical species. General results from reading the strategies foreseen - As it was mentioned before, interesting strategies are being implemented by the General Local Plan, Tirana 2030 with the main author Studio Boeri, but where many other actors were involved. One of the main strategies is related to the control of urban sprawl by the implementation of a Perimetral Park or as it is also known as Metrobosco. This is the first case in the modern Tirana were landscape is being used as a strategy for shaping the built environment.

One particularity of the Metrobosco, is its position adjacent to the informal areas, which are positioned at the perimeter of the city.

Informal building - Informal settlements in the Albanian context would be considered the groups of self-made constructions with the main residential function for one, two or several families of the same family trunk. The traditional building methods are being used which includes reinforced concrete construction and brick wall. They are constructed sometimes in several years, as per the possibilities of investment, mainly assured by the emigration. Each building owns its parcels of land, occupied or purchased. It is important to understand that the type of informal building in Tirana is not similar to that found in Latin America, India, or any other developing country where their main character is that of a temporary building. The informal settlements in Tirana are self-made constructions, guided by no planning, but have a permanent character, which makes them one of a kind with additional attention - due to the sensitivity people for their investments.

Buildings Characteristics - The building themselves are positioned in the individual parcel. In general, it was hard to define their characteristics as they appear to be very diverse. However, we can conclude: (1) That in all areas the building footprint varies but the footprint of 250-300 m² is more common; (2) The buildings tend to have a bigger footprint especially near the main roads; (3) The height of the buildings varies from 1 floor to 5 floors, but again the height of 2-3 floors is the most common height used for the residential areas; (4) In general, the southern and eastern parts of the samples tend to have a bigger height than northern and western buildings; (5) As per the architecture, it is understood that the buildings are the product of their plan rather than by architecture, the formality in the outside. There is a little or no repetition of the same model and also the same roof. Both flat terraces and sloped roofs are being used.

Parcel Characteristics - and surrounded by walls and railings. They tend to create groups, still, they are different in the material used, chromatics, design from each other. It is obvious that through it the private land is defined. This is not just a matter of feeling protected in a new territory, but also is a tradition of the individual city homes and also the rural ones. The main characteristic of these parcels is the presence of green. Gardens, vegetables, vineyards, and fruit trees are present at almost every individual unit.

Group of Buildings - It is very difficult to define the groups of informal buildings in these areas. In the most flatten territories, where previously agriculture was being developed the groups tend to follow the previews agricultural infrastructure and somehow blocks of two to three rows could be recognized. In the hilly areas, where rural homes existed previously, the informal settlements tend to follow their order - the following of the same level - and somehow respect the existing topography. More chaotic are the areas which result to be filled 100% with informal settlements although they try to follow the natural terrain. The main models we can define are (1) Straight linear; (2) Linear that follows an arch; (3) Disperse in the territory. This last one might derive from the "city view" tendency of the developments, as it is mainly found in the territories next to Mount Dajti.

Street Patterns - There is almost now database available on the development of informal settlements, but from the orthophoto [www.geoportal.asig.gov.al], it is possible to understand that the building was made first and after pathways were turned into streets for serving to the area. Again, different areas have developed their street pattern. In the flattest territories, they could be defined as (1) Linear and Tree type in the previews agricultural area; (2) Curved linear and Tree type in the natural territories; (3) Tree type in the hillier environments. A distance of around 3.5m - 4m is between the facing walls. As it might be understood, the space of the pathways (streets) is defined by the surrounding walls of each house. Lately have started investments in developing the infrastructure such as sewerage, and pathways usually treated with concrete and asphalt. Characteristics of the Grid - In almost all lands, in a ratio of 400m, the main land-use is the residential one. The patterns created tends to fill the whole territory in a similar order. The areas not covered by informal settlements are due most probably to the topography. Besides the cases were services previously were positioned, in most cases, there is a lack of these services such as kindergartens, schools, ambulatories, public spaces or even other services necessary in the everyday life.

Discussion

The understanding of the previews functioning of the territories was informal settlements are being developed in Tirana it gives a general idea of the land qualities, environmental qualities, but also informs for the presence of any infrastructure of earlier functions.

Somehow traces of the past are conserved and still recognizable. This is important to conserve as data for later being used for strengthening the identity of the different areas. The sample areas 800m x 800m, representing a ratio of perfect walking distance to a neighborhood as per the distribution of necessary public spaces, and other public services illustrate the lack of these services in most of the cases.

The morphology of the informal building itself, with the individual gardens, trees, and vineyards, illustrates the connection of the inhabitants to the environment and products of the territory. Somehow this is related to the people's lifestyle but also corresponds to the previews land use of the territories. This results also in a building pattern that conserves somehow the natural characteristics of the land and where the sponge qualities function better than in other planned areas of the city.

The strategies implemented by the General Local Plan are necessary to be involved in the study as illustrating the strategies foreseen for the future and help in structuring the future necessary interventions. From studying these particular areas, not too many results to be solved as per the regeneration of these areas. But the use of the Landscape in the perimeter, adjacent to the informal areas presents a great asset to the informal settlement, in our opinion they could be translated in big possibilities of interventions.

This study aimed to further understand mainly the urban morphology of the informal settlement. Elements such as relation between buildings and space, relation between buildings themselves, patterns or order they tend to create, characteristics of the spaces such as individual gardens, characteristics of streets and pathways, functionality of the areas in terms of services to be able to measure the sustainability scale of such developments are a very important study for further developing strategies and ideas.

Conclusions

This study aims to contribute to a further understanding of the informal settlements in the city, as being the most vulnerable areas, are often object either of non-inclusion or too strong interventions. On the other hand, as much as we study them, we understand and get to know the values and positive energies of the inhabitants which could lead us to the following strategies: (1) Integration of the city, the peri-urban areas, and natural environment; (2) Contribution of the development of these informal areas themselves in terms of quality of life; (3) Improvement of social cohesion between different parts of the society; (4) More direct contact between the city and the peri-urban;

With the development of the Perimetral Park, and based on these characteristics, strategic projects could be developed afterwards where landscape would be the main tool of intervention.
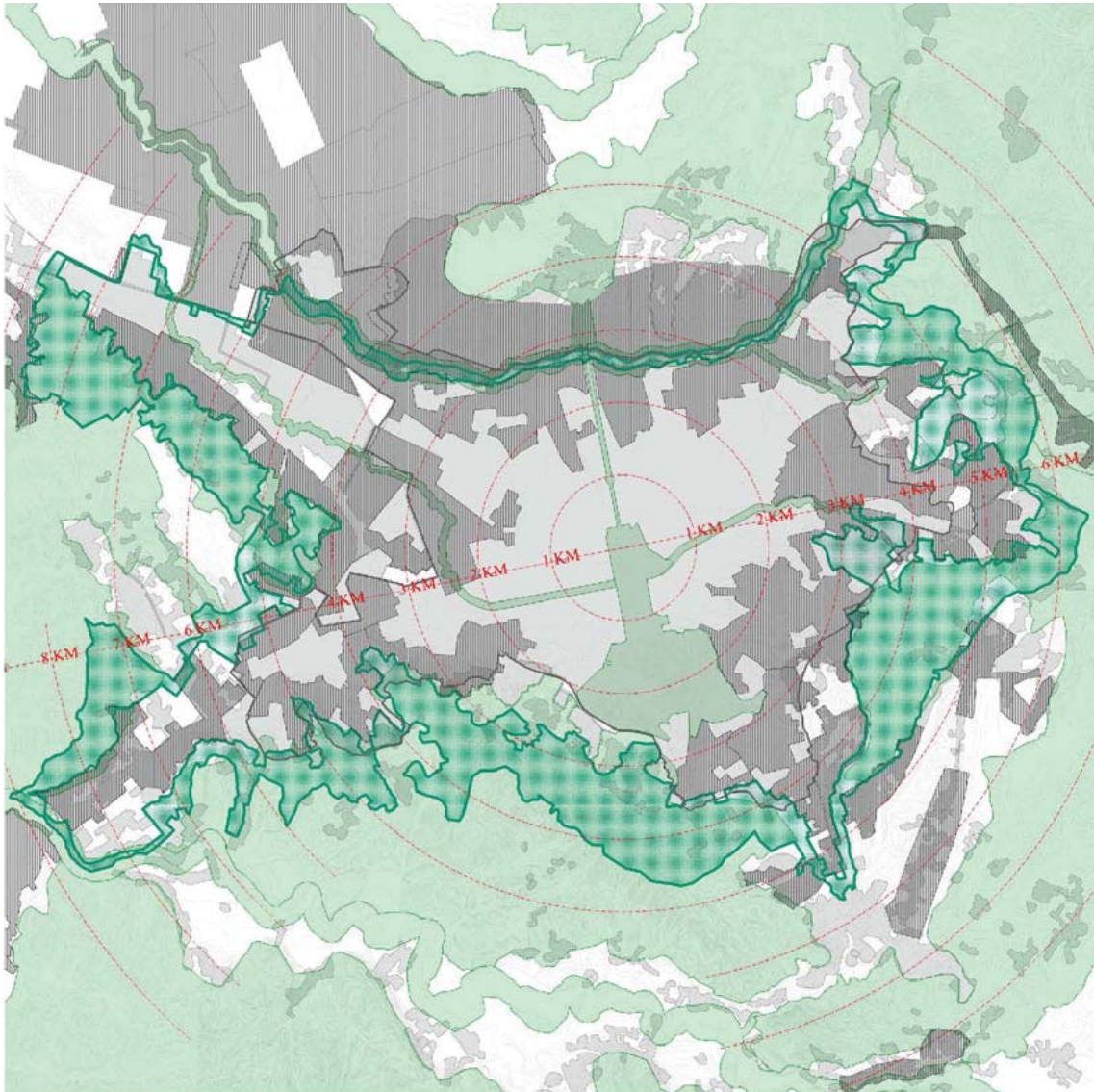
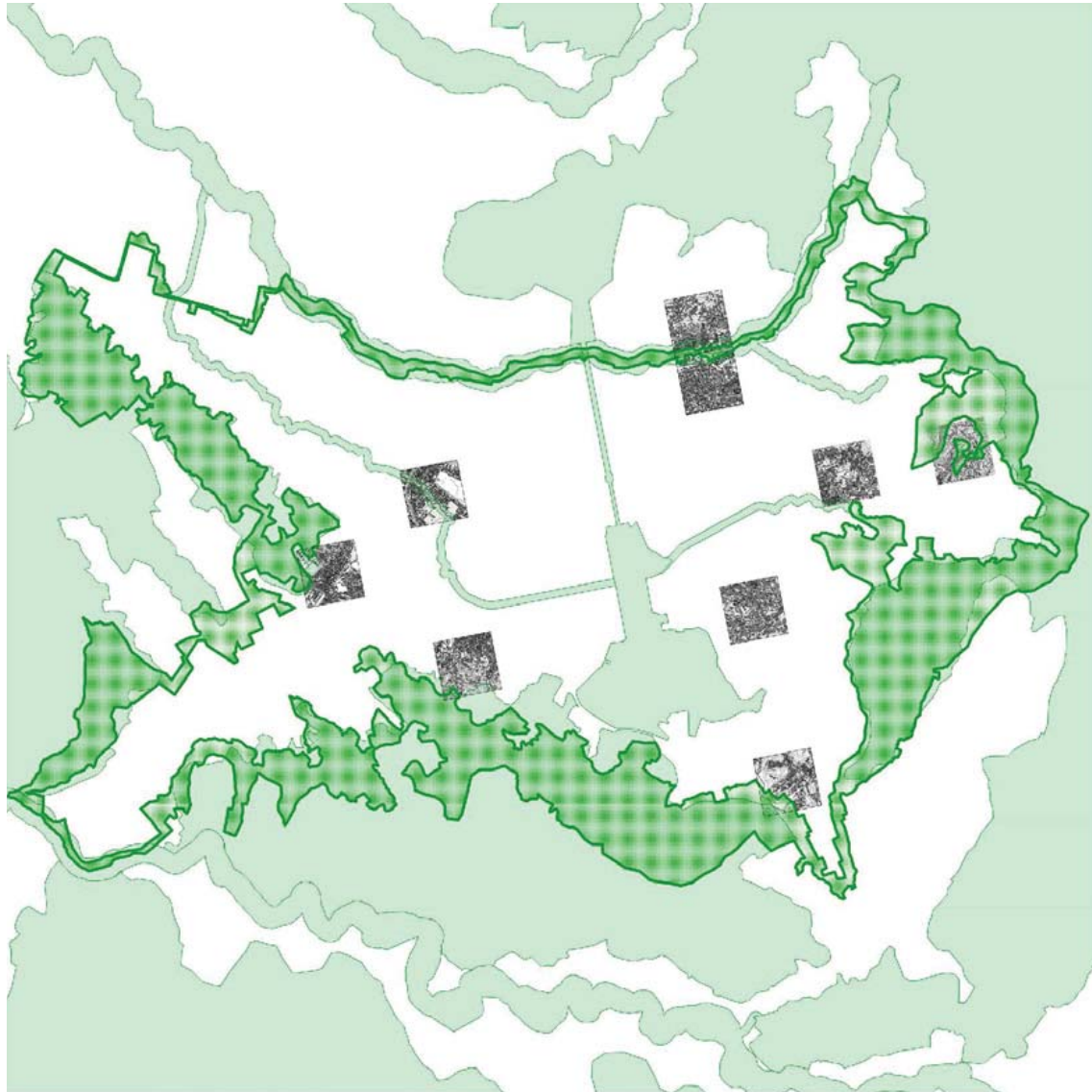**Figure 1.** Urban Sprawl, Informality and Metrobosco Map, Tirana City.
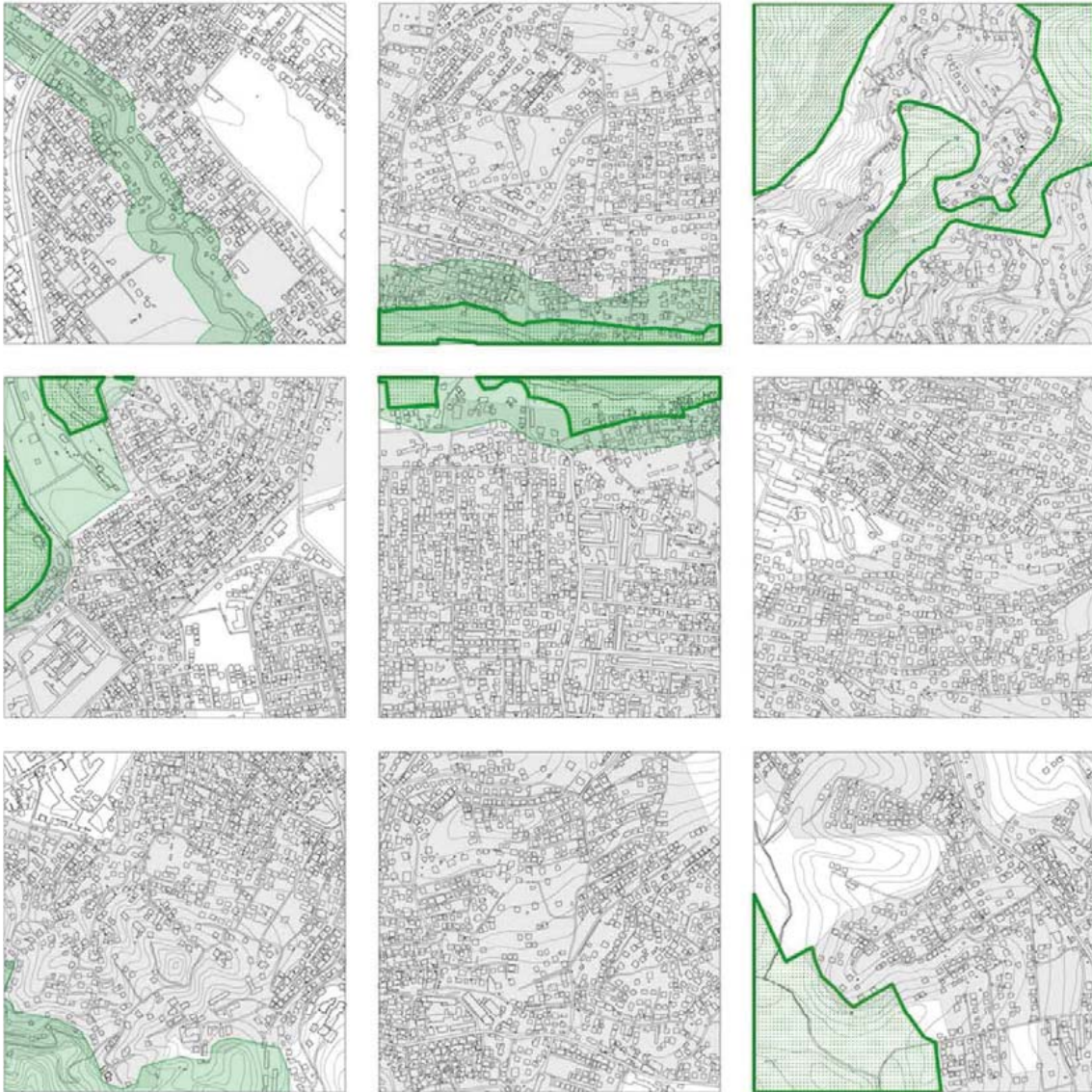
Figure 2. Position of Case Studies.
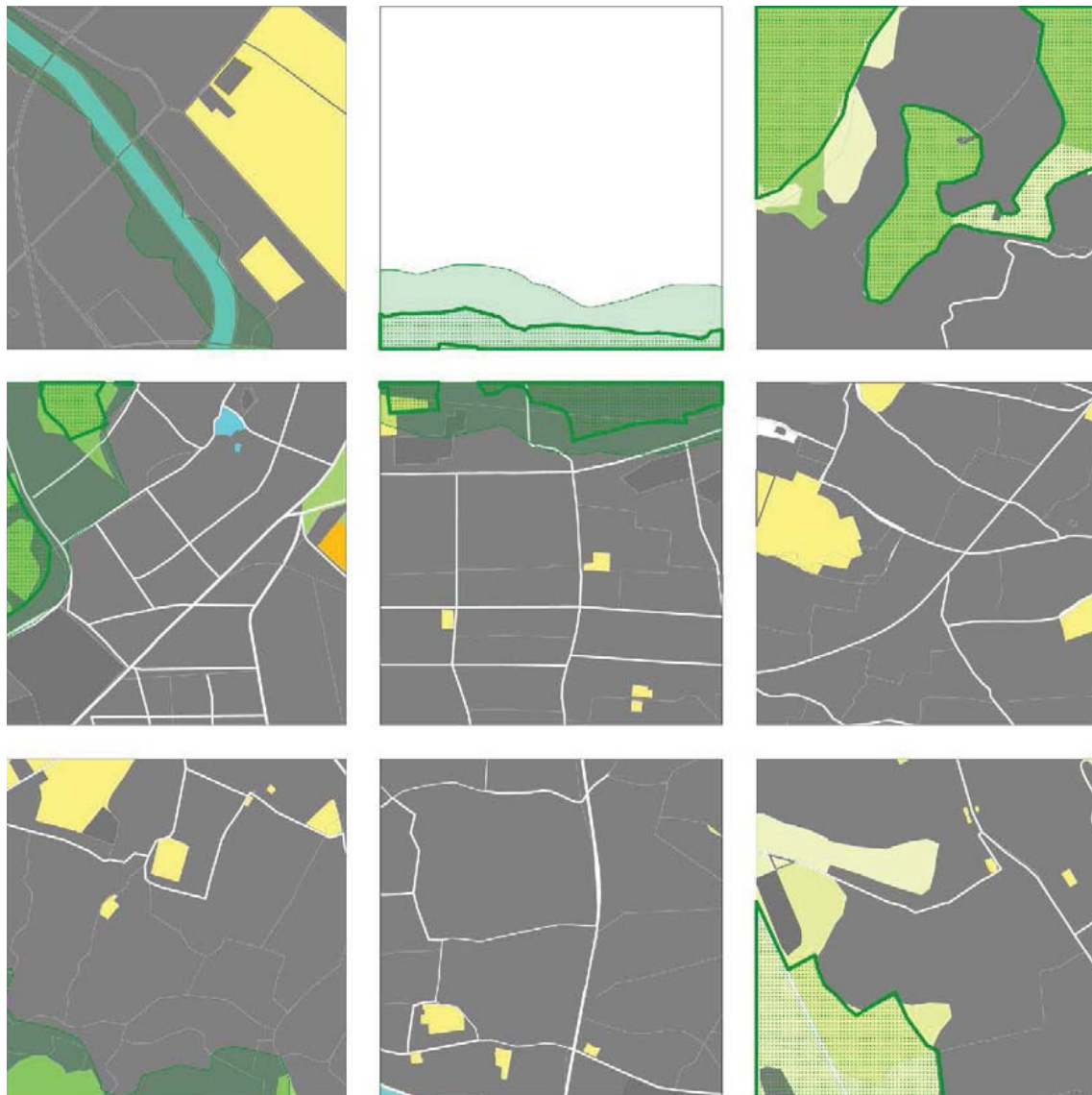
Figure 3. Case Studies.

Figure 4. Proposed Land Uses from General Local Plan, Tirana 2030.

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Morphological legacies and informal city: understanding urban dynamics in the Vetor Leste do Centro in São Paulo

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Abstract

From the middle of the 20th century, the center of São Paulo began to undergo a deep urban transformation resulting from the transfer of the ruling classes to other sectors of the city.

The related dislocation of higher-income housing, trade and services toward the southwest of the metropolis has left the city center in a social, economic and urban decay.

The Vetor Leste do Centro, classified as the first industrial suburb of São Paulo, is the territory that has most being participated in the urban metropolitan process and it represents the privileged area where the sedimentation of ways to inhabit has produced continuous spatial modifications. Its intrinsic condition of centrality, as well as being the gateway for the Easter Zone of the city, demonstrates a series of historical and geographical conflicts of the Varzea Do Carmo's urbanization which confers the peculiar morphology to the area. Consequently, to read its tissue it means recognizing the sequence of each life cycles that the metropolis of Sao Paulo has experienced through its urban expansion, from its colonial period until nowadays.

The analysis starts by recognizing, in the urban morphology, distinctive elements of typical industrial landuse. The criterion, that has been chosen as the driving guideline, is the spatial and functional modification occurred inside each urban block during the industrial dismission.

The paper critically examines how the urban area of the VLC represents one of the most complex and interesting case for understanding how formal and informal practices has intervened in the production of the urban spaces of this large metropolis.

Introduction

From the middle of the 20th century, the center of São Paulo began to undergo a deep urban transformation resulting from the transfer of the ruling classes to other sectors of the city.

The related dislocation of higher-income housing, trade and services toward the South-West left the city center in a social, economic and urban decay[1]. The centrifugal growth from the center to the periphery, represented by the occupation of peripheral land plots, and its corollary centripetal growth, carried out by the heavy transportation system installed to support the fast expansion, were decisive factors in urban organization of the central areas. As a boomerang thrown from the inside to the outside (Meyer, 2004), the road structure, that connects the center to the farest neighborhoods that formed the immense outskirts of the metropole, reinforced the center as a congested passageway and contributed to deform the local scale on behalf of big-scale intervention.

As a result, the downtown of São Paulo reaches the '90s as a fragmented territory full of social complexities, reflecting the inequality that has structured the space of the city during its urbanization process.

A Leste do Centro

The central area of São Paulo finds its interpretation not really within the administrative perimeter in which it is inscribed[2], but more in the definition of those systems and metropolitan-scale urban issues that interfere with its territory.

While new and distant sectors of urban expansion has been opened indiscriminately in a constant search of spaces where to build new housing complexes, central areas, highly equipped with infrastructure and mass transit, have been subject to a profound process of depopulation. This striking paradox has laid the foundation for the comprehension of the extreme social precariousness situations which today coexists among the sectors with the largest concentration of jobs posts in the city (Bonduki, 2001).

Inside the innumerable problems related to the downtown decay, the increasing presence of low-income population, allocated in a precarious way, becomes the most remarkable. A closer look at the historic centre of the city presents an interesting case for understanding this phenomenon and how formal and informal practices intervened in the production of the urban spaces.

In order to analyse the historical, functional and morhological organization of central areas, it is necessary to introduce, as an instrument, a territorial element that can describe the dynamics of formation and structuring of complex urban zones. They are, therefore, named "Vectors" those urban sectors whose configuration is strongly connected to the relationships that they establish within different scales of the metropolitan territory and various infrastructure systems that support them.

The Vetor Leste do Centro, whose main features has been identified by the professor and urbanist Regina Meyer[3], is taken as the study area. It has the physical, social and spatial features such as to classify its territory as the first industrial district of São Paulo and, by analyzing its urban scenarios through volumetric flows and changes of densities, it is possible to define its condition of "central suburb" which witnesses the urban spaces transformation over time as the most problematic and alive part of the metropolis urban pattern. Its intrinsic condition of centrality, as well as being the gateway for the Easter Zone of the city, or rather the more vulnerable, demonstrates a series of historical and geographical conflicts of the Varzea Do Carmo's urbanization which confers the peculiar morphology to the area.

The area of the Vetor Leste do Centro is located just outside the East side of the historical center of São Paulo and it contains, within its perimeter, deep physical barriers that, besides having contributed to fragment its urban tissue, have defined its area as a deep fracture in terms of economy, social development and urbanity. The basin of the Tamanduateí river has always been a constant challenge in urban development of São Paulo for its natural characteristics that have influenced various forms of appropriation. Initially it imposed a natural obstacle to the expansion towards the East

side of the city, which favored the urban occupation of the hills in the West opposite direction. The height difference between the historical hill and the basin of the river, as well as the instability of periodic floads, did not facilitate the occupation of the area during the first phase of consolidation of the city. On the other hand, the flat topography of the river basin justified the construction of Santos-Jundiai Railroad in 1897, stimulating the industry installation along the train lines and the growth of the working-class neighborhoods across the river. The construction of the road Radial Leste and the implementation of the East line of the subway definitely consolidated the East-West direction as the main structural axis of sprawl expansion for lower income population.

The urban form analysis

To understand the reasons that led to current condition, the study necessarily starts from the analysis of its historical configuration understanding the urban evolution.

The analysis starts by recognizing, in the urban morphology, distinctive elements of typical industrial landuse which help to classify five typologies of urban blocks within the perimeter of the Vetor Leste do Centro. The criterion, that has been chosen as the driving guideline, is the spatial and functional modification occurred inside each urban block during the industrial dismission. The new configuration is here presented by emphasizing the transitional condition derived from the gradual change of the socio-economic profile of the city from 1930s until now (Fig.1).

a) Original industrial blueprint: the Vetor Leste do Centro still conserves historical "artifacts" which stand as industrial memories within a standardized logic of urbanization. The industrial installation, occurred in the early decades of the 20th century, facilitated the blueprint and land-use heterogeneity. Therefore, not having undergone spatial modification, this type of urban blocks present a large footprint and a land-use reduced to a mono-variety function.

b) Villas Operarias: these urban blocks typologies are characterized by the presence of the historical working class-villages, born with the aim of housing the large number of workers settled in the area during the early 1900. Always located side by side with factories, this urban type is easily recognizable since it still contains historical features which are visible in the old working-class housing elements.

c) Forced co-exhistence: during the years, next to the old industrial footprint, the construction of new high residential complexes have partly transformed the original urban block in order to support the high housing demand.

d) Metro-line construction: in 1986 started the construction of the new metro-line which currently connects the East and West side of the city. Differently from most of the others, the new stations, due to topography and high costs, were realized on the surface, requiring a process of surrounding areas expropriation. The consequent rise of land-value, due to the installation of a new infrastructural pole, caused the displacement of the majority of population, which was economically forced to leave the district. The Vetor Leste's main industrial features started to be denatured by new construction.

e) Industrial features loss: the fifth type of urban block has completely lost its industrial memory. New popular housing constructions have took place and privatized outdoor spaces by high walls and fences. The modernist settlements, born with the aim of responding to a high housing deficit for low income people, therefore have characterized the urban blocks by the only one residential use, depriving the large areas of services, commerce and the street-life related to it.

While this classification deals with a gradual spatial transformation of the historical industrial blueprint, it is possibile to identify another parallel analysis which is the result of a set of informal practices as expression of the social vulnerabilities present in the area.

Central areas, in fact, have recently started to withstand an increment of service demand and housing density without, however, recording an equivalent verticalization of their urban settlement. This invisible densification highlights the presence of common social practices carried on outside the regulatory framework of the state.

It is possibile to observe that dynamics of improper uses of buildings emerge within the urban tissue as punctual discontinuity of the formalized settlement. Therefore vacant spaces, abandoned buildings and old tenements houses have been appropriated due

to the failure of the formal system to fulfill the spatial needs of marginalized individuals or communities. Moving towards an emergence of a roof, these practices have grown faster than the formal structure can accommodate, resulting to be a less manageable dynamic.

Cortiços[4]: slumming in the city center

While the formation of clandestine plots (loteamentos irregulares) and precarious self-built houses (favelas) have mainly been established in the outskirts of the metropolis, a third typology of informal settlement has not always followed this logic, penetrating the formal and central city and operating extra legally in a context where the state has been weak in enforcing housing standards[5].

Rental tenements handed over by their original owners to be sublet or taken care of by third partie (cortiços), are conventionally regarded as slum when they are improperly used as overcrowded multifamily dwellings and subject to extremely precarious living conditions.

Due to their ability to survive over different historical and morphological situations, it is possible to identify a classification of five main types of cortiço inside the Vetor Leste do Centro:

a) Casinha (Small house): a detached building facing the street, only considered cortiço for the use it has;

b) Hotel-cortiço (Hotel slum tenement): Reserved rooms or collective dormitories;

c) Prédio sobrado convertido em cortiço (Two-storey houses converted into slums): a room with several improvised stoves shared by everybody, some poorly installed latrines, and long ill lit corridors;

d) Cortiço improvisado (Improvised slum tenement): at the back of lumber and building material warehouses, on building sites, in barns and stables;

e) Cortiço de quintal (Courtyard slum tenement): the doors and windows of rows of small houses open onto a courtyard or public area, with the same internal divisions and the same capacity.

It is interesting to underline that the first three typologies do not consider the need of changing the structure of the building they are "parasiting" besides several new internal subdivisions. The last two ones, instead, include the creation of new self-constructed and precarious volumes, reiterating their condition of informality.

Situated in the formal urban setting, unlike most favelas which are built on extra-urban land invasions, today cortiços are mostly located in areas that have been subject to a process of deterioration and decay, but contiguous with zones rich in jobs and services. The main important reason for living in a cortiço is, in fact, to be able to be in the central region: all the sacrifices of cramped, unhealthy and expensive housing are compensated by the proximity of work and public services.

Conclusions

Reading the morphological tissue of the Vetor Leste do Centro means, in part, recognizing the sequence of each life cycles that the metropolis of São Paulo has experienced through its urban expansion, from the industrial dismission untill nowdays, representing a dramatic illustration of social inequality and division that have occurred.

From the analysis here reported, it is possible to affim that during the last decades a reversal trend, supported by three main factors, have contributed to the slow decrease of the peripherization process of the metropolis and a hidden densification of the central areas.

Primarily, the progressive replacement of industry with tertiary sectors increased trade and service activities that helped to concentrate the employment offer in the central regions. This change consolidated a starting point that would recover the central region as the major focus for employments in the city.

Secondly, the inefficiency of public transport meant not only a high cost for commuting but also a great physical expenditure given by the excessive time required and the conditions of discomfort that consequently resulted. For many workers, living in central

regions has meant a great saving in the time taken getting from home to work, plus a reduction in transport costs. Finally a more rigorous policy on plots parcelling activity in the periphery tried to stem the intense illegal process by compromising the widespread trade of irregular suburban lands.

To sum up these factors, it is possible to explain better the reasons that led a big part of low-income working population to consecrate, as decisive, the proximity to the workplace where the offer of employment, infrastructure, and service was already established.

This dynamic opens a new discussion on the process of reconfiguration of existing urban compartments that, for decades, have been subject to policy negligence, excluded from revitalizing interventions and private investments.

Call for houses
{ SPATIAL PRACTICES TO FULFILL HOUSING NEED }
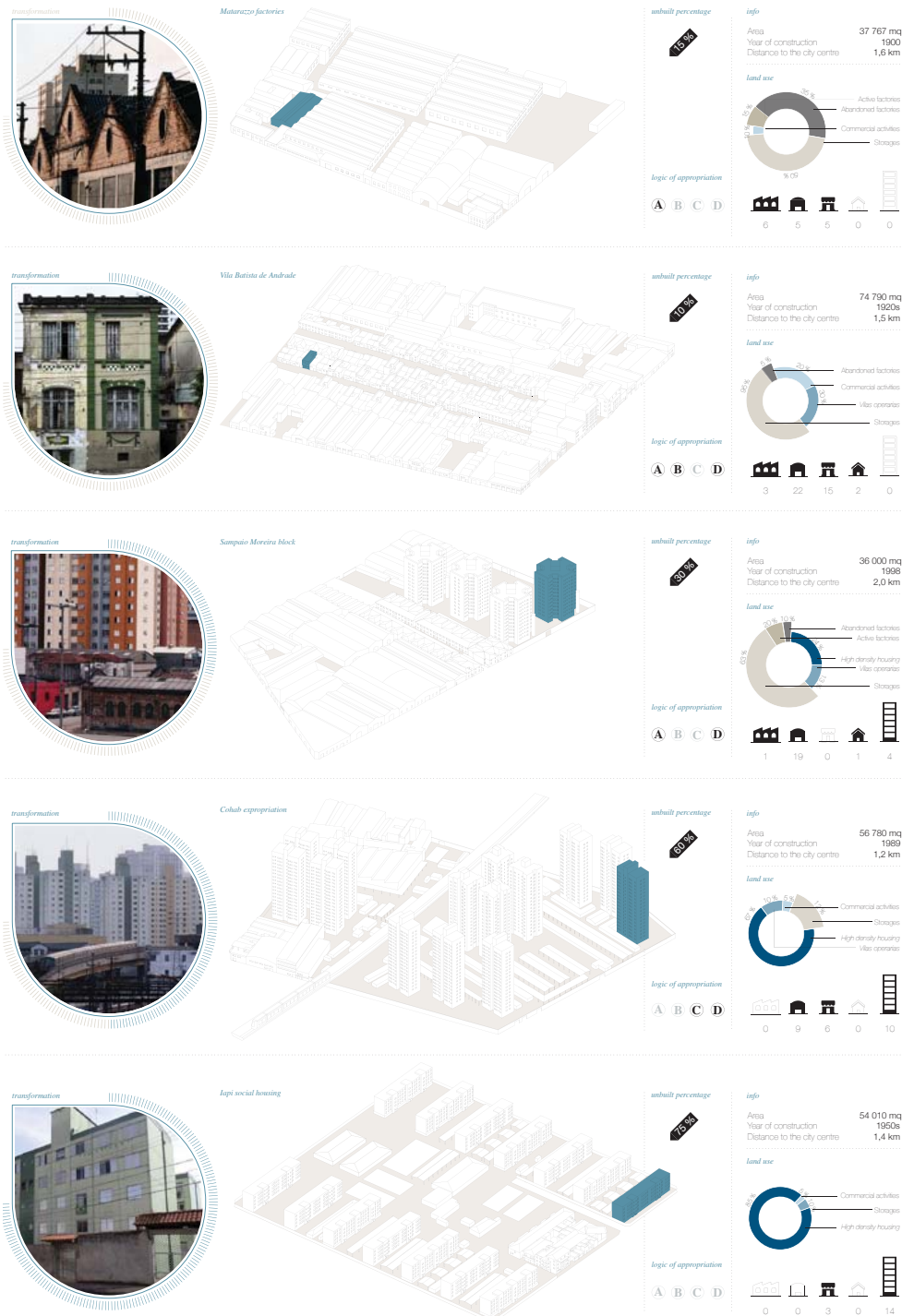
Figure 1. It is a simplified diagrammatic classification of the urban fabric of the analyzed area (Vetor Leste do Centro). The criterion chosen is the spatial and functional modification occurred inside each urban block during the industrial dismission, from 1930's untill nowdays. Despite the Vetor Leste do Centro's historical morphology has been deformed by a heavy spatial transformation which partly included the construction of large populare dwellings, dynamics of improper uses of buildings and spontaneous practices emerge within the urban tissue as punctual discontinuities of teh formalized settlement.

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& | and
CITY REGENERATION | design tools

Footnotes

[1] The contribution to the emerging decentralization and the consequent progressive decay of the central areas came with the combination of two important factors: firstly the creation of elite suburbs in the South-West region marked out the new territory of the rich; secondly the gradual change of the econo- mical profile ensured the displacement of the main industrial poles in the South-East of the metropolitan region defining the new direction for peripherical lands occupation.

[2] Analyzing the centre from an administrative point of view, it is composed by the districts of Sé and Republica. Its historical demarcation is now strongly reinforced by the presence of two perimeter axes (rotula and contrarotula) and two diametrical axes. In north-south direction the complex is defined by the Anhangabau tunnel and Avenida Prestes Maia that form, with their respective extensions (Avenida Nove de Julho and 23 de Maio), the road system called "Y" created in the '30s.

[3] Regina Maria Prosperi Meyer is a professor at the FAU USP (Faculdade de Arquitetura e Urbanismo at the Universidade de Sao Paulo). She graduated at the Universidade de Brasília - UnB in 1975 and obtained her master's degree at the Bartlett School of Architecture, University College London in 1979. She got a PhD at FAU USP in Sao Paulo 1991 and created the Laboratory of Urbanism of the Metropolis - LUME - at FAU USP in 2000. Main publications: São Paulo Metrópole (Edusp / Imprensa Oficial. 2004), and A Leste do Centro - territories of urbanism (Imprensa Oficial, 2010).

[4] *Cortiço* is a Portuguese term, popularized by Brazilian author Aluisio Azevedo in his 1890 novel, which depicted poor, but vibrant, urban culture in late 19th century. At that time, *cortiços* were the main housing option for migrants, who rented rooms in old te- nement buildings, subdivided to maximize landlords' income from the lucrative rental market. No less lucrative, present-day cortiços house approximately 600,000 people in the Municipality of São Paulo and 38,000 in downtown São Paulo according to CDHU – the state construction company for social housing. Normally subdivided into tiny over- crowded rooms rented to whole families, cortiços are fre- quently highly congested, with shared low-quality facilities for water and sanitation, offering little privacy and lacking open spaces, sunlight or ventilation.

[5] Popular housing in São Paulo has almost been established in the city's periphery. The building market has never had too much interest in reform and re-arrange the existing central areas so, the production of new popular units on a large scale has always been more profitable than building new fabrics in a consolidated urban tissues tied by more restrictions. However, it is essential to take under consideration that building new housing settlements far from the city infrastructures must deal with a number of other necessary conditions to live with di- gnity, not accounted in terms of property value but extremely important in terms of cost and quality of life (for example eco- nomic opportunities, scho- ols, kindergartens and health clinics that the government should build on the periphery to meet the families needs).

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Urban configuration: morphological study of two new towns in mid-twentieth century in Brazil

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Abstract

Two new towns were planned in Brazilian pioneering agricultural colonization zone, Cianorte and Angélica. Both were designed in the early 1950s, linked to a specific town planning tradition. Cianorte late resonated the notion of the city as a work of art, alongside with some features of the garden city; while Angélica early exemplified the rationalist urbanism for a functional city in Brazil. The aim of this paper is to contrast the urban forms of the two cities, exploring the adopted design strategies, and point out their potentialities and weaknesses. As a result, this morphological study unveils, on one hand, the layout of a town according to classical precepts of composition and the creation a unique townscape; and, on the other hand, the configuration of a radically modern, functionally standardized and uniform town. In both cases the adopted design strategy impacted the development of the urban form: in Angélica, the land use pattern and the occupation of the urban tissue did not follow the revolutionary, modernist configuration of the morphological elements; in Cianorte, the urban growth ignored the city-beautiful layout and did not materialize the proposed planning proposals.

Introduction

The transformations of the territory in Brazil in the 20th century can be seen as a sign of modernization and development, and as a consequence, the creation of new cities resorted to innovative configurations as a sign of progress and social transformation. Two urbanistic traditions then based the design of new cities: first, academicist urbanism and, later, rationalist / functionalist urbanism (Rego et al, 2017; Pinheiro, 2010). But how did you imagine living in the new modern cities planned in the interior of the country? What differences does the layout of cities show in the two urbanistic traditions?

To answer these questions, two new cities planned on pioneering colonization fronts were selected: Cianorte - PR (1953) and Angélica - MS (1954), substrates for morphological analysis - of lots, blocks, roads and public spaces, in order to point out the link of each urban form studied with the mentioned urbanistic traditions and indicate their particularities. In this analysis, data on population density per block (from the number of existing lots and the average number of inhabitants per household in the decade of the city project) were considered, the dynamics of urban occupation, the shape of the block, the functional zoning and the urban fabric of each project.

Hired by private initiative, two urban planners designed new cities to be built in the interior of Brazil, in the early 1950s, driven by the process of modernization of the country and occupation of national borders promoted by the government of Getúlio Vargas under the slogan of March for West.

Jorge de Macedo Vieira, an engineer graduated from the Escola Politécnica in 1917, designed the Cianorte plant - one of the four main cities founded by Companhia Melhoramentos Norte do Paraná, which started the survey work for the project of this new city in 1951 and began its implementation in the northern state of Paraná in 1953 (Bonfato, 2008, p. 124; Steinke, 2007, p. 151). Jorge Wilheim, an architect recently graduated from the Faculty of Architecture of Universidade Presbiteriana Mackenzie in 1952, designed Angélica in Mato Grosso (South) in 1954 (Wilheim, 2003, p. 33).

The coexistence between modernist and academic ideals was already detected since the 1920s (Pinheiro, 2010). While Wilheim became familiar with Le Corbusier's work and the urbanism postulates of the International Congresses of Modern Architecture (CIAM), without ignoring 'English urban planning and its garden cities' (Wilheim, 2003, p. 33), Macedo Vieira already had designed garden neighborhoods and three new cities - Águas de São Pedro (1937-1938), Maringá (1945-1947) and Pontal do Sul (1951) - revealing a hybrid practice, using the garden city idea, to formal aspects of the city movement beautiful and the rules of composition beaux-arts (Bonfato, 2008).

In this way, while Angélica is an exponent of the first rationalist traces that have an apex in the construction of Brasília, Cianorte materialized one of the last traces of a new city linked to the 'beautiful city' in the 20th century Brazil. With the objective of understanding the urban forms and detecting part of the urban problems, potentialities and weaknesses of each one, this work started from the redesign of the outlines of Angélica and Cianorte, in order to highlight the configuration, characteristics and relationships of the morphological elements - public spaces, roads, blocks and lots. Resuming methodological procedures for geographic historical analysis (cf. Oliveira, 2016; Costa and Netto, 2015) like those of Conzen (2004), this work analyzes the urban fabric in three aspects: the city plan, the use of the soil and the built-up fabric, composing the proposed landscape through layers.

Urban forms: the case of Cianorte

Cianorte's urban layout (Fig.1) appears as an indication of modernity due to the confrontation with the "grid" urban design model, until then local tradition. At this point, the nineteenth-century urban ideas began to guide the urban design of the new cities created in the region: aesthetics and spatial quality are the basis of the image of the city of the future in Brazil, supported by a tradition that was already passed in Europe.

Jorge de Macedo Vieira starts from the particularities of the site and structures the city from the station's semicircular square, from which three avenues departed, highlighted by the width of the road and by the central flowerbeds, which axes organize the design of the

rectangular blocks in the central portion of the city. The two side avenues lead to an urban park and the church square; the central avenue leads to the civic center, the set of buildings around an ample free space - the heart of the city -, configured following the precepts of the city beautiful movement.

The sports center of Cianorte, like its civic center, also builds a classic arrangement of buildings and free space. The perimeter of the city is irregular, resulting in an amorphous urban patch, conditioned by the green areas bounded around the springs and along the streams. The articulation of the avenues and the junction of multiple roads, resulting from the accommodation of regular paths on uneven surfaces, takes place through roundabouts.

The different residential areas of Cianorte are not organized around secondary centers, just as the city in general is organized around the main center, the civic center. Even so, these residential areas are individualized by the configuration of the set of blocks or the limits found in a park or avenue. With dimensions of 170 x 135 m, the blocks are characterized, for the most part, by their regular and rectangular shape, conditioning 16 lots of the same configuration and average areas around 590 m2, with an average density of 120.2 inhabitants / ha. In this analysis, data on population density per block (from the number of existing lots and the average number of inhabitants per household in the decade of the city project) were considered.

The analysis of the urban fabric of residential neighborhoods shows that the growth of the city is not due to the reproduction of the road network, but to the constitution of new individuals, approaching, as Bonfato (2008, p. 128) acknowledged, 'to a close design of the 19th century classic '. Reconciling the functional purpose to the aesthetic, sets of buildings, open spaces and vegetation punctuate the city and are strategically arranged in the urban fabric in order to build perspectives finished off by large buildings, taking up the concept of the boulevards proposed by Hausmann. However, the city is the result of a hybrid urbanism by associating the rules of composition beaux-arts with the picturesque environment of residential garden neighborhoods.

Urban forms: the case of Angélica

In turn, Jorge Wilheim rethought the city of his time in primarily functional terms. The rationalist argument favored the typified and reproducible solution, supposedly beautiful according to the parameters of the machine age. As a result, the layout took on a more geometric, regular and standardized shape. Angélica (Fig.2) has a regular and rectangular shape due to the orthogonal paths and the set of rectangular blocks arranged in a terrain with little slope.

The configuration of urban functions is also a reflection of the Athens Charter: the city is clearly divided into sectors: commercial, recreational and residential, which are articulated around the civic center, the central core of the city. Following the same logic of segregation of uses, the conformation of the city and the distinction between pedestrian and car routes is a particularity that must be highlighted.

Access to the commercial sector is guaranteed by pedestrian routes drawn in the longitudinal direction of the city, as well as by car routes in the transversal direction, which culminate in culs-de-sac inside the commercial blocks. The civic center is located between the residential and commercial sectors, concentrating all the government buildings in a strip of institutional areas that cross the city, ending with a sports and recreation square to the north and, to the south, by the botanical garden. and a natural forest reserve.

The residential sector is configured by enclaves, super blocks and neighborhood units. Standardized, the residential can expand linearly. A set of 20 455 m2 lots arranged along a cul-de-sac forms a 130x70 enclave; three aligned enclaves create the superquadra. Arranged along a strip of green area with collective equipment, including the school and local businesses, two super blocks form a neighborhood unit, with dimensions of 670x370 m. In addition, Angélica presents some singularities that go in the direction apposed to that proposed by Le Corbusier: the dwellings were implanted in isolated and defined lots, and not in verticalized buildings of high density, directly impacting the density of the residential areas, which is 156.0 hab /ha, and consequently in the landscape and urban dynamics.

The clash

The result of such different design strategies culminates in urban fabrics of different composition and shapes. In Cianorte, the civil and urban engineer Jorge de Macedo Vieira resorted to a 'hybridism' (cf. Bonfato, 2008) that resonated with the garden city idea, proposing a city in a particular, specific, handcrafted way, which dealt with sets of buildings , free space and vegetation, art and its classic principles of composition shaped urban beauty (Rego, 2012). Following the precepts set out in Raymond Unwin's handbook of urbanism, Vieira treats the individuality of urban form as a positive quality, achieved by subjecting form to the specificity of the place: a 'conscious artistic design of irregularities' (Unwin, 1909, p. 104) working on the irregularity of the site through the composition and arrangement of urban design in a particular and regular way. Thus, the extension of the city is done adding new neighborhoods with a singular configuration, according to the topographic circumstance: individualization.

In Cianorte, it is noted that the absence of an architecture compatible with the scale of the monumental layout of academic origin impairs the legibility of the city's image due to the absence of buildings of referential expressiveness, conforming less attentive to the spatial quality of the original project. Consequently, of the parameters established for the morphological analysis (the city plan, the use of soil and built-up tissue), the latter showed greater incongruity with the original project.

On the other hand, Angelica is a product of the machine age. Functionalism is materialized through the abstract spatial arrangement, ordered and standardized following typified geometric orders and sectorized according to the proposed use. The urban expansion of the city would take place through extensive linear reproduction, echoing the idea of neighborhood unity developed by Clarence Perry in the 1920s and applied by Clarence Stein and Henry in the Radburn layout (1929) - 'the garden city of the era of the automobile ', a reflection of the attempt to create a scientific method of applicable design solution, which will become a constant even for more complex situations (cf. Benevolo, 1993, p. 634).

The rationalization and predictability of the urban form resulted in a configuration of spaces very different from the traditional one. Consequently, the subjection of the population was impaired, and the city did not reach the estimated population, compromising its development. Of the three morphological aspects that guide this work, land use is the one that presents the biggest discrepancies: the separation of uses in functional sectors is not verified, trade has spread over almost the entire city, including in residential areas, impairing expressiveness of the vicinal commerce foreseen for the neighborhood units, and these areas remained empty or were occupied by residential use.

sit amet, consectetur adipiscing elit.

Conclusion

Responding to two distinct urbanistic traditions, Cianorte and Angélica represent the coexistence of academicist and functionalist urbanism in Brazil from the mid-twentieth century, until the hegemony of the latter in the post-Brasília period. The layout of the beautiful city that characterizes Cianorte is strongly dependent on an architecture that completes its spatial configurations: sets artistically composed of free spaces, vegetation and buildings. In effect, the morphological analysis showed the inconsistencies between the built fabric and that proposed in the original project. On the other hand, the layout of the functional city that characterizes Angelica, standardized, indistinct and segregated, results in the impoverishment of the urban landscape. The morphological analysis showed the problems resulting from changes in the use and occupation of urban land, diverging from those originally proposed. The treatment of urban form in the two routes is radically different: in Cianorte urbanism is still a formal issue; in Angélica, the form makes room for the function to occupy a priority position.

With regard to sectorization, Angélica has her fabric configured with post-Brasília precepts, governed by the strategy of configuring functional urbanism. At this point, the contrast between the attempt to create an urban area through an individualization through alignment with the precepts of academic urbanism, and the strategy of constituting the

urban network through the repetition of a mechanical process is evident.

Unlike Cianorte, Angélica's road layout did not have axes or perspectives; and the expressiveness of squares and public places has disappeared amid the collective and indefinite aspect of undivided free spaces and the separation of uses proposed by zoning. Thus, in the general plan of Angélica, a generic city is seen, guided by eminently functional issues and organized by a grid structure, with the absence of hierarchical strength and expressiveness of order as a result of a Cartesian, regular, serial layout.

The dimensions of the "blocks", which started to be treated as enclaves, decreased in the city of rationalist urbanism in relation to the beautiful city of academicism. This reduction in dimensions is due to the contiguous free green area, typical of the neighborhood unit. As for densities, it appears that Angélica's residential "blocks" are the densest, as a result of the application of the strategies of configuration of rational urbanism. Moving from one tradition to another, in Cianorte the density of 120.2 inhabitants / ha compared to 156.0 inhabitants / ha in Angélica explains the impact of the urban design strategies adopted.

Thus, while in the traditional city the figure was associated with the empty spaces of the streets and squares and the background with the solids formed by the built agglomerate, the relationship between figure and background existing in the traditional city was inverted in the functional modernist city - it went from the solid continuous for the continuous void (Rowe and Koetter, 1995, p. 56; Kostof, 2009, p. 154; Braga, 2010, p. 202).
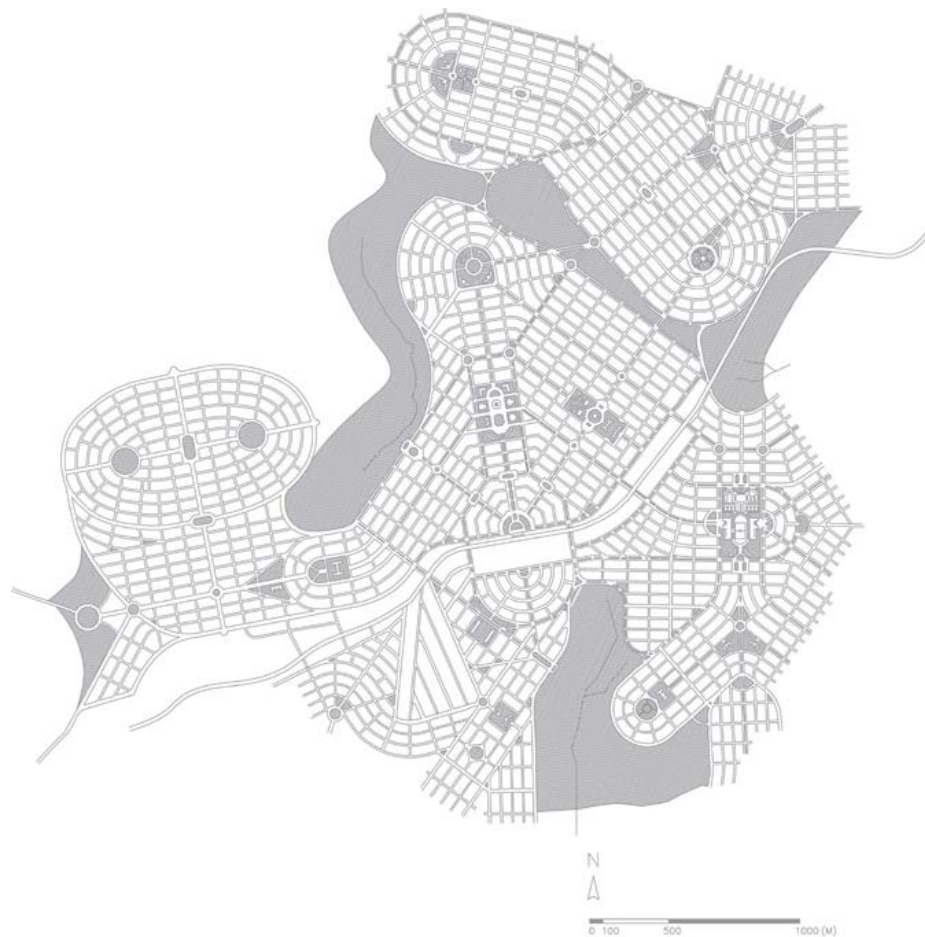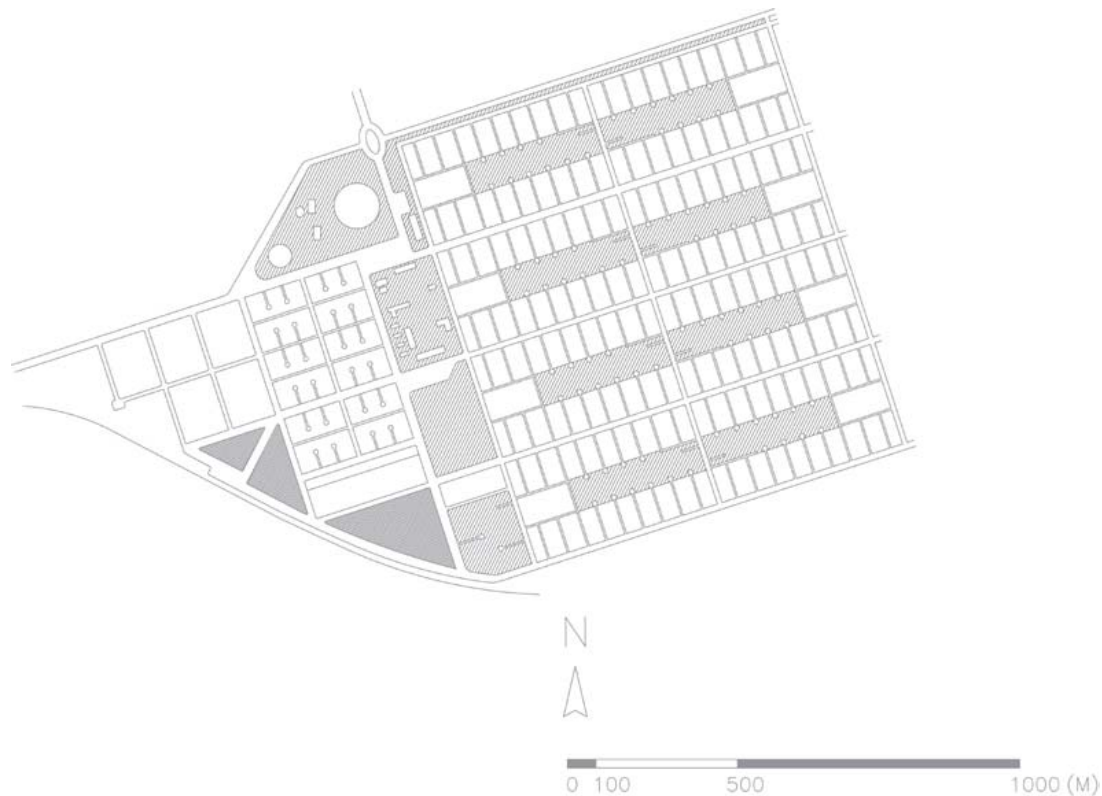

Figure 1. Cianorte city plan.

Figure 2. Angélica city plan.

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Spatial Ambiguity in Singular Buildings.
Timeless composition principles interpretation

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Keywords: *Ambiguity space, threshold, singular building*

Abstract

The contemporary city incorporates architectural spaces that question a classic and rigid boundary between public and private space. Spatial configurations emerge that promote ambiguous spaces of collective appropriation where compositional themes such as porosity, transparency or the physical dilution of limits are understood as tools for the design and creation of new spatial relations between building and city.

Therefore, the article seeks through a comparative reading based on typological analogies (between buildings or urban substrata of the past and works of the present) to decode some of these phenomena and systematize different types of transitional spaces between the built fabric and the public space. With Lisbon as a framework, namely a set of paradigmatic singular buildings of this reality, we intend to understand how spaces such as atriums, courtyards, passages, corridors, galleries or thresholds contribute to the construction of thick ambiguous spaces where public and private overlap. The inner-outer binomial acquires a new spatial dimension, where the limit gains thickness and where the collective dimension participates in the overlapping exercise.

Methodologically the article is based on a morphological decomposition of the contemporary architectural objects analyzed in comparation with examples from the past, establishing parallels between the conceptual approaches and, thus, underlining their role as didactic objects and timeless references for the conception of future solutions.

Introduction

The city, as a living organism with enormous dynamism, embodies in its physical form (urbs) the society (civitas), which inhabits it. In this sense, the contemporary city faces nowadays great challenges, needing to adapt to new technological systems and new ways of appropriation of the urban space.

Throughout its history, the city, with a European cultural matrix, has always built an intense relationship between the built fabric and the public space. The building of singular character (Dias Coelho, 2013)[1] acquires a symbolic and spatial referencing meaning. Its positioning, or configuration, is fundamental in the interaction that it establishes with the empty space (unbuilt). From the Greek agora, to the Roman forum, to the Sixth V operations in Rome or Haussmann in Paris, among many other examples, it is possible to witness this link that is built between singular building and the public space that contemplates it.

In modern times, i.e. throughout the twentieth century, the dialogue established between the Singular Building and the public space has been composing, with more frequency, spaces with great ambiguity. The Singular Building has become a promoter of spaces where the boundary between public and private is not clear.

This article aims to reflect on the theme of ambiguous space in contemporary architecture, seeking to understand how some architectural objects acquire a certain porosity, promoting spatial solutions of great diversity and urban interest. It is intended, through the systematization of some strategies adopted, in type-cases observed in Lisbon, to synthesize reference solutions to be taken into account in project conceptions, both academic and professional[2].

Public-Private space ambiguity

"In addition to the more or less two-dimensional plastic values that traditionally are associated with the facade, this fringe can be seen as a spatial entity within which the possibilities of living on a different scale are simultaneously recognized and explored", Manuel Aires Mateus

The twentieth century is deeply marked by the theoretical principles established by the Modern Movement, which constituted a dramatic break with the pre-existing city. From the second half of the century onwards, theoretical thought sought to react to the new dogma, emerging several currents that reinforced the relevance of composing a balanced and integrated dialogue in the urban and landscape context. The so-called crisis of the isolated architectural object leads to a new disciplinary thinking that seeks to emphasize relationships between buildings and the values of the public space they define (Montaner, 2008). The architectural work should adapt to a context, configuring a more human spatiality.

However, at the turn of the millennium, contemporary architecture produced a set of objects of great complexity, where the articulation of different uses and different natures required sophisticated solutions for construction systems, distributive systems, internal circuit management, spatial diversity, among many other themes, but where the spatial relationship with public space is often not explored in the best way. For these buildings, several authors have come to classify as Hybrid Buildings (Fernandez Per, 2014). Even so, following this growing trend, a series of projects emerges that choose, in a direct or indirect (more subtle) way, to work with a spatial complexity in the interior-exterior / public-private relationship. Parts of the buildings become open for public use or interior spaces are transformed into areas for public-collective use. The conception of these ambiguous spaces that articulate the outside and inner space ends up promoting new, more versatile, collective ways of living, where the perception of limit is diluted. The theme of the limit dissipation, transparency, fluidity or extension of the public space emerges as a clear strategy of acquiring the place, building a bond and creating architectural atmospheres and ambivalent appropriations. To a certain extent, in the 50's and 60's of the 20th century, we can see several examples where this interaction with the place leads the architect to conceive spatial solutions that seek to articulate the interior-exterior space, building gradual transitions between city-building or landscape-building, see as an example the cases of the Manzoni Theater (Alziro Bergonzo, 1950) or the Muuratsalo experimental house (Alvar Aalto, 1952).

In fact, Giambattista Nolli had already exposed this question in 1748, through the Rome representation where he expresses an innovative idea, at the time, which goes through a fusion between the free space of the city and the singular building with public use (churches, entrances or even palaces courtyards). The plan reveals the structural relationship that some built typologies establish with the urban space, particularly when they create a deep relationship of complementarity and intertwining between different spaces in the city that have an identical public or collective vocation. From the reading of this plan emerges the awareness of public spaces transversal system associated with the dichotomy of street-building, or square-building, and the threshold valorisation that Aldo Van Eyck already executed in the middle of the 20th century. Van Eyck understands that public space is an entity that is beyond the free space between buildings, it is something that in a way is integrated into the buildings themselves. Consolidates the concept of threshold, a three-dimensional space definition of limit, as opposed to an approach that establishes it as just a surface. The ground floor (or the building entrance moment) assumes itself as a fundamental device in the interior and exterior articulation, as well as in the ways of appropriation of that same space and its articulation with the structure of the city's public space. Xavier Monteys (2017) reaffirms part of the principles imagined by Aldo Van Eyck, transposing them to a more urban dimension, and understanding this permeability between these two urban elements (building and street) creates a transition space with its own character. The extension of interior activities on the ground floor converts the street space into another building compartment, a community compartment - a concept already used by several authors such as Bernard Rudofsky (1969), Louis Kahn (1971) or Christopher Alexander (1977). Thus, the increasing use of a certain contemporary architectural production of transparencies, porosities, permeabilities or simply the absence of physical boundary elements, emerges as a spatial configuration device that reposition a banal relationship between urban fabric and buildings. The architectural design assumes, therefore, a public sense, configuring a collective space that redefines the public and private space of the city (Fig. 1). The architectural object opens up to the public space, incorporating spatial or visual porosities and configuring places for permanence. Private spaces, for collective use, assert themselves as moments of continuity in the public space. Thus underlining the indissociable relationship between the architectural building and the public urban space, between the form of the buildings and the form of the city.

The development of architectural atmospheres of ambiguous spaces therefore emerges in the contemporary debate on architecture. Its use as an instrument of spatial composition and simultaneously as a way to enhance the public sense (Innerarity, 2006) of certain works, contributes to reinforce the need for architecture with a public sense (Brandão Costa; Mah, 2018). It challenges us to rethink its social role and how it should interact in the qualification of urban space. Therefore, a question arises: what kind of relationship do we want to build between the public space and the built fabric?

Five strategies [types] . the Lisbon case

Lisbon has shown a particularly interesting dynamism in recent decades, not only due to the greater investment resulting from European funds, but especially in the last decade due to the strong growth of tourism. Its built fabric has been acquiring a set of architectural objects where this phenomenon of ambiguous space has been revealed with greater intensity. Thus, and through the observation and characterization of several case studies located in the Portuguese city, it was possible to systematize five types of architectural composition strategies that contribute to the construction of spatial ambiguities, naturally framed by the question of the relationship between public and private space.

Square
> *"The term praça (square) is Latin in origin – platea – and it is used to identify a public space of an exceptional character that is morphologically distinct from the channel-like spaces that streets make. (…) as spatial supports for civic institutions (…) served multiple functions (…) has consolidated its collective character and has given it extra importance…"*, Carlos Dias Coelho

One of the strategies used on a regular way is the construction of a square, a large open space that aims to articulate the transition between public and private space and simultaneously constitute a wide space for reception and permanence. One of the examples that best expresses this solution (although it has not yet been built) is the project for the New Lisbon Mosque, designed by Inês Lobo in 2013. Located between two structural streets[3] of the eastern urban fabric of the city, Rua da Palma (axis of Avenida Almirante Reis) and Rua do Benformoso, the New Mosque project conforms a connection between these two streets while referring to a system of small squares that exist along the main avenue.

The idealization of this square, as a structuring element of the design project, assumes particular formal interest because, through a relatively simple solution, Inês Lobo, simultaneously resolves issues such as: the creation of a transition area between public and private space; a topographic difference between the two streets that delimit the plot; the constitution of a space to meet, a place for social inclusion[4]; and finally, the definition of a multifunctional space. The architect concentrates the built components near of plot limits, close to the pre-existing buildings, opening the central space of the plot for the square. This is an extension of the sidewalks of both streets, and the topographic difference being overcome by a slope that winds the space dividing it in two moments. The first, next to Rua da Palma, is close and protected (through a built body that covers it) allowing a gradual transition between a busier street and the second one, the square itself, located by Rua do Bemformoso. This first moment, covered and where the slope develops, also emphasizes itself as the moment of distribution of flows, oriented to users and showing in a discreet way for more private, collective or totally public circuits.

The square space is a clear contemporary reinterpretation of the central courtyard of the historic mosques, a fundamental element to users' reception and distribution. The space created by Inês Lobo builds a tension in the user who feels that he travels through a public space at the same time that he understands that it is an integral part of the mosque.

Patio

"Man needs a space of peace and recollection that protects him from outer, hostile and unknown space ...", Werner Blaser

This dubious sense potentially constituted in the New Lisbon Mosque project, is expressed in a deeper way, in Chiado, where an integrated patio system opens the inner space of the blocks to public use.

In 1988, after the great fire that destroyed this emblematic area of the center of Lisbon, Álvaro Siza Vieira was called to develop a design project for the requalification of the blocks affected by the fire. In the master plan he promotes the creation of a patio system that introduces a new logic of circulation and spaces to stay that complements the main axes of Rua Nova do Almada, Rua do Carmo and Rua Garrett.

At first glance, the Chiado appears to remain exactly as it was[5]. The recovered facades express an image of the past that Siza reinvents as transition and opportunity elements to access the interior space of the block (Frampton, 2000). What appears to be a conservative intervention and preservation of the past, is in reality a deeply transforming intervention of the place. The patio system, later expanded with the Gonçalo Byrne intervention in the Empire quarter (north of Rua Garrett), between 1994-2001, allowed the addition of a new layer of urbanity in the neighborhood. The inner space of the blocks becomes, in fact, a public space, although access is conditioned at night, transfiguring the urban layout of Chiado. The system composed by passages and small permanence spaces offers people a variety of circulation paths, or places to stay. The patio, constituting itself as a public space with more privacy, creating the feeling that the users are in a more domestic space, diverging from the greater urban intensity that exists in the three structural axes of this urban area.

Passage

> *"The passage is neither structure nor infrastructure (although it is both); what makes passages passages are the things that happen there, what the senses make out and the perception of 'what's going on', that which is experienced (which is carried out)"*, Carles Llop

This idea of the use of courtyards as a way of crossing happens in several situations in the urban fabric. However, it is interesting to observe the formal strategy that Nuno Portas and Nuno Teotónio Pereira used in the case of the Igreja do Sagrado Coração de Jesus.

The formal option adopted by the architects allows to build a connection path between opposite sides of the block, conforming a spatially diverse path. The passage appears deeply linked to the building, shaping and structuring part of its form and principles of programmatic organization. The street as if extends into the interior area of the plot, building a penetration of the public space into the interior of the private space and at the same time creates a dynamic, spatially rich and diverse internal space. Several platforms allow to articulate the existing topographic difference and at the same time establish the connection to different parts of the religious complex, such as the crypt, the galleries and balconies of the church or the parish support room.

The symbiosis established between architecture and the urban dimension makes it possible to valorise the public space, which results in the decrease of the building lead role as an isolated architectural object, diluting it in the urban structure. The church presents *"a good volumetric solution and correct urban integration"* (Pereira, 2011) at the same time that it creates a break in the compositional rule of the urban grid of avenues.

It is also important to highlight the fact that this passage has a visual continuity through the next block. In alignment with the main entrance of the church, the starting point of the passage, there is a second passage on the block across the street. Although this second passage crosses through the block, connecting two streets, it has no public use. It is a private access to the interior of the plot, where a small patio was constituted as a social space of an architectural studio. However, the visual alignment intensifies the structuring sense of Igreja do Sagrado Coração de Jesus passage, and produces an alternative, complementary logic of urban circulation in the avenues urban grid.

Transparency

> *"Transparency is not just transparent. Transparency has many nuances, which can imply an interesting artistic potential to express ambivalence"*, Herzog & De Meuron

The fourth strategy refers to the use of transparency as an instrument to eliminate the limit. In this topic, it is perhaps worth remembering that Mies Van der Rohe is an incomparable reference, due to the way he incorporated transparency into his architectural work and, at the same time, worked on a balanced dialectic between permeabilities and tie-up systems to the place. Mies' work relates to a meaning of urban architecture (Christ; Gantenbein, 2012) or even architecture with a public meaning, which means that it builds a shared place, with spaces for public use. This last idea is revealed in a particularly interesting way in the Lisbon Cruise Terminal, completed in 2017, where João Luís Carrilho da Graça deals with the double idea of shelter and transparency.

The building consists of a large shell that, without touching the ground, suggests a high permeability through the continuity of visual relationships that are created. This formal configuration builds a tension between transparency and dialogue with the place, retracing the implantation limits of the pre-existing dock, it opens to the river on one side and to the Alfama district on the other. This formal relation reminds us works made by Mies such as the Seagram Building (New York), or the Neue Nationalgalerie (Berlin) where there is an almost total dematerialization of the facade plan on the ground floor. This fact translates in the public space extension to the inner parts of the building making it an essential feature of the architecture. The same composition principle is present in the Lisbon Cruise Terminal. Light, shadow and glass planes are recurrent in the construction of the physical border between exterior and interior, but do not block the perception of

continuity. The setback of the groundfloor facade plan in relation to the shell limit, as if it recreates the idea of gallery present in the Neue Nationalgalerie, in the clear creation of a transition membrane; outside but covered and protected by the shelter structure.

Threshold
> *"There is a dissolution of the boundaries between the private and the public that interested us to explore."*, Aldo Van Eyck

The last strategy focuses on how the idea of limit is worked. This question is specifically dealt with in the FPM 41 Tower, designed by Patrícia Barbas and Diogo Seixas Lopes and opened in 2019. The office tower offers subtle solutions, but with great compositional sophistication in the definition and conception of limits.

Mies Van der Rohe Seagram Building is one of the assumed conceptual references referred by Patrícia Barbas in an interview. Similarly, FPM 41 Tower presents a variation of alignments between the ground floor and the upper floors. The main volume respects the logic established by the orthogonal grid of the neighbourhood, following the alignment of the surroundings blocks. However, the ground floor has an indentation, building a dialogue with the alignment built on the other side of Avenida Fontes Pereira de Melo[6] . This alignment, combined with the notorious transparency of the ground floor (in contrast with the other floors) not only produces a greater dignity of the entrance , but also generates a covered space of articulation between the exterior and the interior. The entrance under the console *"It is a private space, but it will be of public usufruct and for us, it is related to the Fontes Pereira de Melo. It is at this moment that the avenue widens, Imaviz moves back, Portugal Telecom moves back, the Sheraton ... this had to be sewed and serves as background, with some delicacy"* (Barbas, 2018)

The ambiguous space created, and, at the same time, the transparency used, reminds us the method of dematerialization of the frontier idea that in recent times some Japanese architects such as Kazuyo Sejima or Sou Fujimoto have used as a tool of spatial minimalism and enormous visual permeability. However, the combination used by the architects, in FPM 41 tower, of transparency and recessing the facade in the ground floor, intensifies the sensations of freedom of walk to the interior, contradicting a certain pre-determinism that defines the facade plan as a mineral border between the public and private spaces. In PFM 41 Tower, the public space invades the inner space and in parallel the private space defines the atmosphere of the public space. The limit acquires, therefore, a thickness that is revealed spatially and not only as a surface to cross (Van Eyck, 1962).

Epilogue. Learning from the past, thinking in the present, to design the future...

From the examples and solutions systematized through the Lisbon case, it is perhaps worth recalling the question initially posed - what kind of relationship do we want to build between the public space and the built fabric? - in order to reflect on future interventions in the city.

Reading and decomposing these architectural objects reinforces the idea that we can learn from the past, thinking in the present to design the future. A future that contains richer, diverse spatialities and that takes advantage of the urban atmospheres generated by the ambiguous character that the same spaces gain. As an example, if we take into account this last strategy of architectural composition - threshold - and take into consideration how this theme is reflected, today, along Avenida Almirante Reis, we can see that there is a strong link between the commercial activity present in the ground floors and the existence of urban porosities. The inner space is regularly used as an area for expanding public and social activities of the street. This same level of commitment can be seen in emerging urban elements such as the commercial roads, located in more peripheral areas of Lisbon metropolis. Also, in these elements, there is an intense link between commercial activities and the space appropriation and articulation between public and private (Fig. 4). However, in elements such as the Commercial Road, the public-private space is not properly consolidated and, consequently, the emergence of

interstitial spaces generate fragmented pedestrian flows and disqualify the urban space frequently. This is one of the challenges of contemporary urban spaces in which the huge potential for requalification in the future must rely on the architecture ability to design qualified in-between spaces that relate both public and private space.
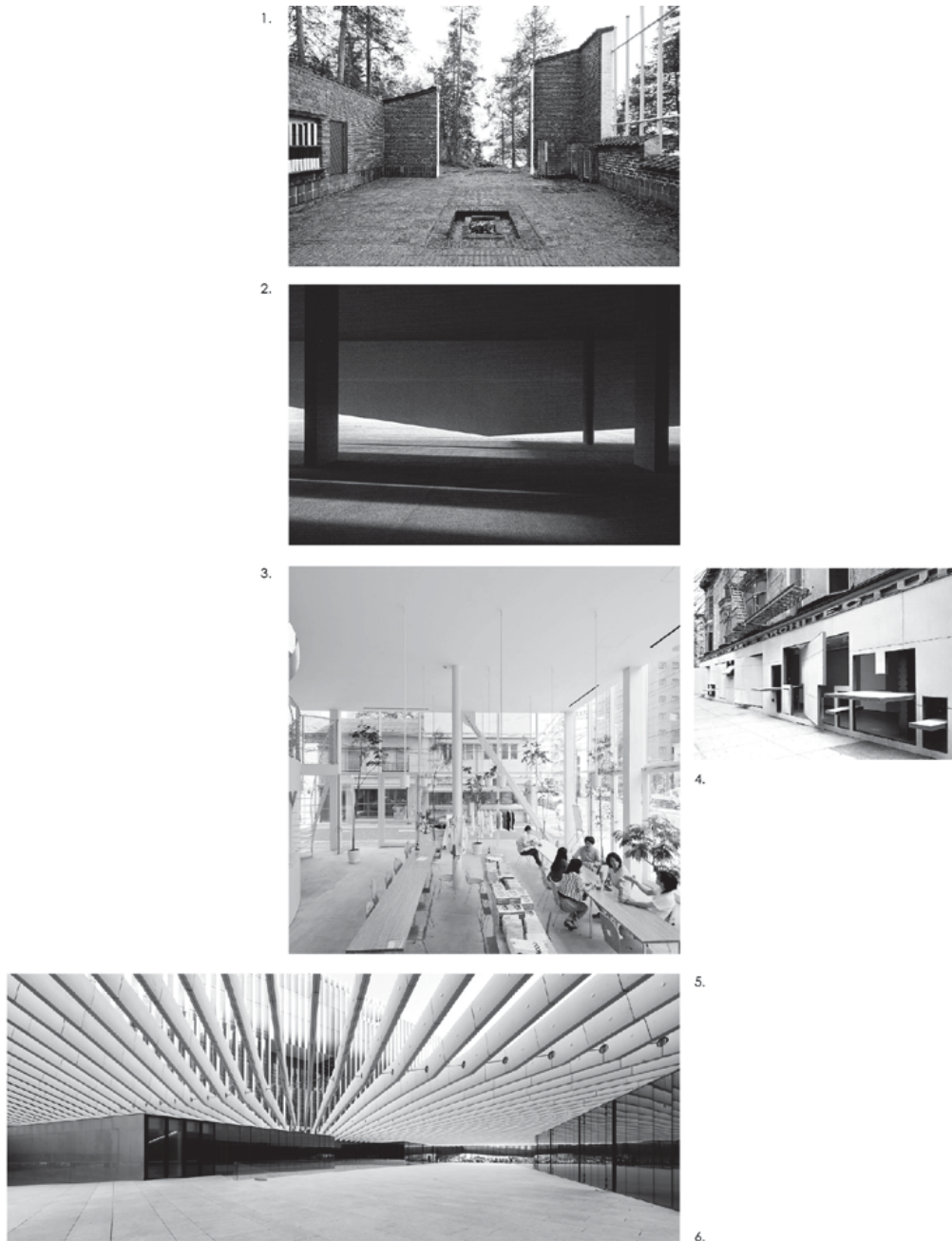

Fig. 1

1 . Muuratsalo experimental house
    Alvar Aalto
2 . Cruise Terminal
    Carrilho da Graça
3 . Shibaura House Office Building
    Kazuyo Sejima
4 . Storefront art and architecture
    Steven Holl
5 . EDP headquarters
    Manuel Aires Mateus
6 . Seagram Building
    Mies Van der Rohe

Figure 1. Ambiguous architectural spatialities

rua do benformoso
av. almirante reis

mosque

lisbon new mosque
2013 *(project)*
Inês Lobo

Square

chiado courtyard system
1989
Álzaro Siza | Gonçalo Byrne

Patio

igreja sagrado coração de jesus
1970
Teotónio Pereira and Nuno Portas

Passage

systemic decomposition

urban layout

Figure 2. Analysis and decoding

shelter

transparency

lisbon cruise terminal
2017
João Carrilho da Graça

Transparency

upper floors alignment

grid alignment

grid alignment

ground floor alignment
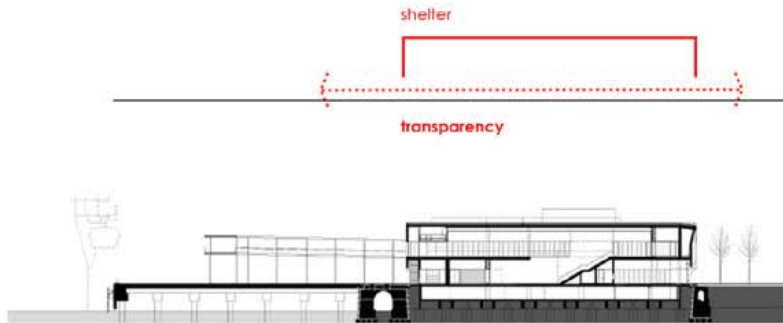
FPM 41 tower
2019
Barbas Lopes arquitectos
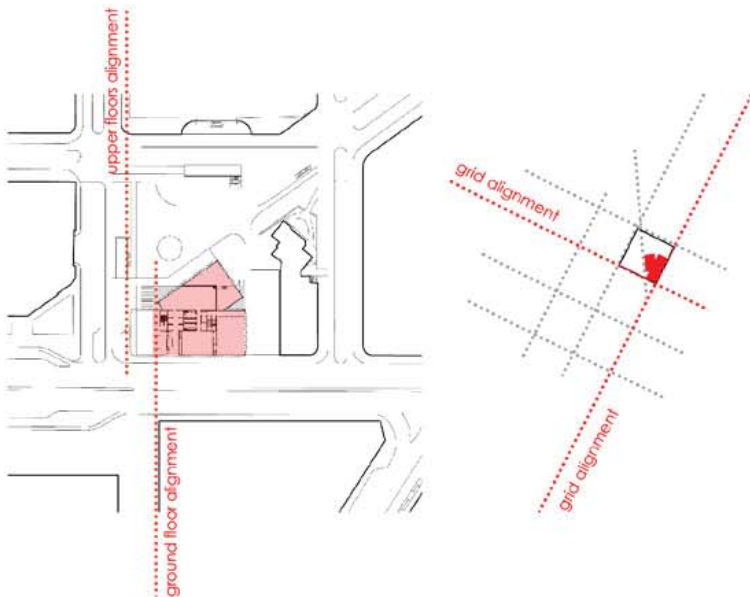
threshold

Figure 3. Analysis and decoding

1.

2.

terrain vague · interstitial space
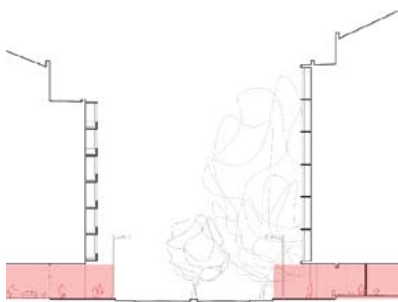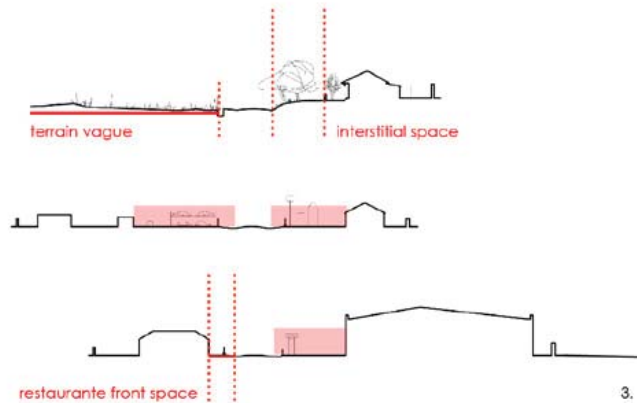
restaurante front space · 3.

sidewalk extension to the interior space
Avenida Almirante Reis
0   5 m

space between road and buildings
N378 . Commercial Road
0   10 m

4.

Fig. 4

1 . Avenida Almirante Reis photograph
   1962
2 . Avenida Almirante Reis section
3 . N378 section
   . different type profiles, exemplifying the diversity
   of shapes and spaces existing along the road
4 . N378 photograph
   2011

Figure 4. Comparative analysis between Avenida Almirante Reis and N378.

Footnotes

[1]Carlos Dias Coelho systematizes the idea of "... the singular building, the most expressive collective expression." taking into account the studies carried out by Saverio Muratori, in the 1960s and later the works made by Gianfranco Caniggia, Gian Luigi Maffei and Mattia Maffei (Composizione architettonica and typologia edilizia, Lettura dell'edilizia base and Composizione architettonica and typologia edilizia, Lettura dell'edilizia speciale, respectively).

[2]The article is part of the research in development by the research group formaurbis LAB (CIAUD / Lisbon School of Architecture - Universidade de Lisboa), namely in the research project Tipologia Edificada / Building Typology, funded by the Fundação para a Ciência e a Tecnologia (ref. PTDC / ART-DAQ / 30110/2017), as well as João Silva Leite's individual research project, with the theme "Start-Up Buildings: The Built Space as Connector Between Public Space and Infrastructural Axes" funded with a postdoc grant by the Fundação para a Ciência e a Tecnologia (ref. SFRH / PBD / 115838/2016).

[3]According to Inês Lobo, this idea is not particularly recent. Since the end of the 19th century, when Rua da Palma was opened, the municipal archives records initiatives from Mouraria residents requesting the construction of a link that facilitates the connection between Rua da Palma and Rua do Benformoso. In https://www.ilobo.pt/Mosque%20 in%20Mouraria.html

[4] This city area is characterized by the existence of several social groups with different ethnicities and cultural customs.

[5] Chiado's renewel exactly as it was in the past was, according to Álvaro Siza himself, an exercise in falsehood. "What it will be. The same as it was? There is an inevitable touch of falseness. ". in Frampton, K. (2000), Álvaro Siza – Complete Works, London, Phaidon, p. 356.

[6] "Both buildings have an axial composition without being symmetrical and are based on a composition principle: alignments and dematerialization of limits". in Fernandes, S.; Silva Leite, J. (2020), "Still Mies. The legacy of public in Portuguese building typologies", in Del Bo, A. (eds.), Mies Van der Rohe. The Architecture of the City. Proceedings: ARCC-Italy 2019 International Conference. Milano: ARCC. (in prelo)

[7] "We wanted the lobby to have dignity. In the offer of office buildings in Lisbon the entrances are secondary things, but for us they are the face of the building. The entrance had to have the dignity of the building we wanted to draw." in Barbas, P. (2018), "Desenhar uma Torre em Picoas e Revolucionar um quarteirão", in Diário de Notícias, 3 de February de 2018.

Caption

Fig.1 - Ambiguous architectural spatialities
Some examples of ambiguous spaces, where the idea of limit (public-private or exterior-interior) acquires thickness and stress itself as a space, a transition area.
credits:
1. unknown author, in https://www.themodernhouse.com/journal/house-of-the-day-experimental-house-by-alvar-aalto/, accessed in 29.03.2020. | 2. FG+SG Fotografia de Arquitectura | 3. Iwan Baan | 4. Pernilla Ohrstedt | 5. Juan Rodriguez | 6. archaic-mag.
Fig.2 - Analysis and decoding
square | patio | passage
Fig.3 - Analysis and decoding
transparency | threshold
Fig.4 - Comparative analysis between Avenida Almirante Reis and N378
credits:
1. [Armando Serôdio, 1962] Arquivo Municipal de Lisboa, cota: AML_PT/AMLSB/CMLSBAH/PCSP/004/SER/005244 | 2. the base section was produce for the works Urban DeCODE made by Ana Berenguer, André Lourenço, Filipa Martins e Miguel Monteiro, 4º ano do MIAU / FA.ULisboa, 2019/2020, coordenation: Sérgio B. Proença and Ana Amado | 3. authors | 4. João Silva Leite

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Shiraz and Kashan. Substrate and Urban form knots, road and band of pertinence for the Morphological Analysis

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Abstract

Two doctoral theses, two Iranian cities, have been the subject of research work target to the renovation project of the building fabric. In one case it was a matter of understanding if it is how the school building can perform a specializing function in the building fabric (Strappa G. 2016) , in the other instead focused the attention on the theme of residential regeneration in the tectonic and compositional tradition.

This paper presents the synthesis of the regressive and stratigraphic reading of the historical fabric of the two cities. The work refines the concept of "restructuring road", focused by Caniggia, used to read the shape of the city. (Caniggia G., 1984; Carlotti P., 2018).

The applied method is to identify, on digitized aerial photography cartography of Cadastre, the role and meaning of the forms present in the map; identifying from time to time nodes and axes that belong the city to have an organic system of relationships (Sauer C. O., 1925). Then subtracted from the cadastral draw, it allows to identify prior substrates organized with systems and structures linked to other different logics and economies.

The overlapping of different urban layers has made it possible to highlight relationships and rules that presided over the different phases of the transformation process of the building fabric, which today can prove useful for the architectural and urban regeneration project.

Two doctoral **thesis**, two towns of the Iran, two historical inhabited centers, Kashan and Shiraz, located, the first in the mountain plateau on the northwestern border of the great salt desert (Dasht and Kavir), the other on the last peaks of the Zagros mountain range, which form a kind of wall on the border between the great Saudi desert and the steppe desert shared with Afghanistan. Geological shores of the Pangeic continent where the mountain range extended between Kashan and Shiraz was nothing more than the compression zone between the mega Eurasia from East Africa which arise it to a height of 4548 meters above sea level (Mount Zard Kuh). For centuries they have been the place of a vertical transhumance that from the Shiraz plateaus moved southwards towards the coast for a seminomadicity of between two hundred and six hundred km and that from the highest altitudes of Shiraz (1500 m) and Kashan (1600 m asl.) of the mountain area called "temperate area or Yaylag", where they spent the summer, descended in winter towards the lower and more temperate plateaus called "tropical valley or Kishlak".

Places of the estivation, of live under tents, of the Mongolian and Turkmen native people that from the steppes of continental Europe, in prehistoric times, found in the Persian highlands characteristics similar to those of the steppes. Peoples who have always followed the same path to reach the tropical area from the coldest areas of the Euro Asian steppes, which include the current provinces of Kurdistan, Kermanshah, Ilam, Isfahan, Chaharmahal and Bakhtiari, Lorestan, Kohgoliyeh, Fars and Khuzestan.

Kashan and Shiraz have been also the subject of doctoral research aimed at the morphological analysis of the strongly stratified and originally organized building fabric **made of** basic housing units, **with** courtyard type built (in the case of Kashan), built using the matter of the place transformed as building element and raised up on the same place.

This paper anticipates the result of the regressive and stratigraphic reading of the historical urban fabric of the two cities, carried out using and developing the concept of "breakthrough street" focused by Caniggia (Caniggia G., 1976; Carlotti P., , and most recently revisited in the) concept of hypergrid and hyperisolated, which symmetrically it inserts in the building fabric of historical and contemporary towns (Moudon A., 2019).

The method used was to identify the traces of the residual alignments in the more ancient residual lines drawn on the digitized aero-photographic cartography (dwg), which from time to time have changed the urban system organization (Sauer C. O.,1925).

The procedure adopted to read the urban fabric, aimed to recognition of the plot shapes, has been portrayed by a block scheme, theoretical basis of an algorithm which, through the recognition of shapes (pattern recognition) and of the bands of pertinence of the roads, that lead the diachronic recognition of the phases of urban transformations.

Road portion designed ex novo or sometimes superimposed on existing road segments, in turn matrices of building fabrics characterized by different geometries, logics and economies. Fundamental elements of the different phases of the building fabric transformation process which in formal transformation can prove useful for the architectural and urban regeneration project.

Hypergrid and hyperblock
The transformation of the city and its urban fabric can take place through substitutions or adjustments. Substitution transformations are usually implemented in the building fabric through breakthrough/ or new additions of hierarchically organized paths.

They are implemented by adjusting, by partial replacements that must adapt to pre-existing plots and block. These are easily recognizable because they usually have a building unit inside, built on the orthogonal bands of relevance made with plots with very irregular and with larger dimensions and often combined with differently oriented alignments. This is true both for historical and for contemporary urban fabrics. Samples of these operations are those that can similarly be observed in many European cities of the XIX s; such as that of Rue de Rivoli in Paris or the Gran via in Madrid or at Rome the Corso Vittorio Emanuele or Viale di Trastevere, but also in the urban fabrics of North American cities as Boston, for which the practice of replacement and updating of the urban fabric has often been due to the pragmatics and economic maximization logics (Petruccioli A., Carlotti P., 1998). Routes almost always created to connect urban knots, developed and designed in the building fabric in previous moments, new streets and urban developments that responded better to the dominant demands and logic of the moment. In the town with orthogonal urban fabric, these phenomena are relatively less evident, but they are

always perfectly recognizable because they tend to organize themselves with orthogonal arrangements, with wider axes hierarchically organized and characterized by bands of pertinence composed of larger lot surface and with taller buildings. I have already had the opportunity to highlight this particular behavior also in Roman fabrics, such as the one observable along the areas belonging to the breakthrough street of Viale Trastevere (Carlotti P., 2017).

In the current urban fabric, these replacement operations are known for the fact that they present irregular situations in the pre-existing fabric and, on the contrary, structures and hierarchies almost similar to those observable along the matrix paths for the newly expanded external sections. However, there is an infinite range of variants of these situations which must therefore be considered from time to time in their precise context.

The practice of "modernizing" the city by replacement and adaptation was a practice also used in the urban transformation operations carried out in the fifteenth and sixteenth centuries, where the opening of the new streets required the arrangement of the facades and the adjustment of whole blocks. An example can be that one can be observed on the Via Giulia in Rome, or in the axis of San Francesco a Ripa this last created to connect two important squares in the fabric of the Trastevere separated by an undeveloped depression that separated these parts of the district (Carlotti P., 2018). In the first section made by cutting the urban blocks and imposing the topological adaptation of new lots and new building types (replacement and recast in line of terraced types) it is possible to observe the effect of the renovation, while in the second section of the street, performed on a the partially void area, the drawing of the new rectangular lots, of a larger size, is organized orthogonally to the route.

Smaller transformations can be observed in several parts of the urban fabric created even before the centuries preceding the fifteenth century, mostly these are small adjustments in the building fabric or individual private transformation that continue over time even in the same space. **As aside case**, they constitute those episodic replacements, such as the square of the nova church, Piazza Farnese, Piazza della Cancelleria which with the construction of a special building (Oratorio dei Filippini and the Palazzo della Cancelleria, have established new urban centralities that has been then linked together with the construction of Corso Vittorio Emanuele in the 19th century.

Similarly, even the most ancient and apparently linked to chance traces respond to these logics of convenience and rationality observed in the fabrics described above. Also these are sometimes due to a sequence of isolated actions which, linked to more spontaneous involutions of the fabric, have led over time to the formation of concave or convex paths and to the infilling of the older building fabric. This is the case of the path in via Monserrato which in its central extension shows a concave trend, due to the advancement of the facades, probably to integrate the stairwell or the shops previously added on the street front and which had partially obstructed its wider seat. For example, in the case of Aleppo (Panerai) is known that, along the colonnaded street of the city, the progressive and irregular occupation of the space between the columns determined the concave and convex trend in the urban fabric, that was still possible to observe in the urban fabric before the war destruction.

Hyper blocks and breakthrough streets in the Kashan urban fabric

The study of the morphology of the central and historical area of the city of Kashan was carried out within the research activities of the LPA laboratory, and it was aimed at understanding the meaning and the role of the central places and their connection axes in the different phases of the transformation process of the town.

Looking at the cadastral cartography of both Kashan and Shiraz, the latest footprints on the city are immediately evident. The "modernization" was implemented with gutting operations, which in fact imposed a new grid and new layers in the historic town. However, the new pattern that overlaps violently on the fabric shows other stratifications, which, although dictated by the same logic, on the contrary, has been metabolized from each new addition and mutation.

The hypergrid has produced hyperblocks that can no longer be metabolized with that substrate that largely constitutes its content. However, this has not erased the form of the historical aggregate that can still be recognized within this new network that isolates and divides urban sectors one time organically connected to each other. If anything, the new axes of the hypergrid force the transformation of the building on the both side of the road margins and then, increasingly driven by maximization logics, to the inner urban

fabric of the hyperblock erasing any other residual traces of the past.

The hypergrid is an idea of a city, which is superimposed on an existing design and which triggers a transformation process that in the long run leads to completely reorganize the urban design.

The thesis assumed and presented in this short essay is based on the belief that each form of block and lot is the result of choices and / or adaptations to inherited and achieved structures. For this reason, it is always possible to deduce the previous phases from this, but only starting from the last one created, which if removed from the cadastral design, show the stratification previously made and overall less evident, with its own centrality and the different connections roads.

The reading of the Kashan building fabric was carried out on an aerial cadastral map capable of providing the exact shape of the land plot and of its built part. The first operation was then to recognize, through the almost total irregularity of the lots, the last imprint superimposed on the town. These are routes created in relatively recent times, traced at the expense of the historical base urban fabric, which by evidently cutting parts of the fabric have designed new and regular blocks composed by plots oriented differently from the larger dimensions and shape trapezoidal

The second operation was instead that, after eliminating the last building substrate, to analyze the bands of pertinence of the paths, as well as the shapes of the lots distinguishing them once again by size and regularity of shape.

It was easy to highlight the paths added in relatively recent stages to the edges of a denser fabric and characterized by particularly irregularly shaped lots.

Morphological analysis and historical documentation

By paying particular attention to the areas pertaining to the evident breakthrough street of the Kashan fabric and subtracting these from the contemporary cadastral map, it was possible to isolate and highlight the residual traces of the paths and building perimeters of an older substratum organized on different alignments and recognizable by the more or less regularity of the shape of the lot.

The contemporary hypergrid, the last of the layers added to the overall urban fabric of Kashan as well as Shiraz, is part of a system of breakthrough street, created in the recent Palhavi period through the disembowelment of the ancient urban fabric. This is in order to connect the main knots to improve the vehicular flow between them. New connecting axes, in between nodes in the urban organism made up of mosques and other special buildings of the Islamic city, that have reorganized the historical building fabric in hyperblocks. However, these have erased part of the historical fabric which had hitherto been nesting, but which is still partially possible to imagine if in the general drawing of the fabric if within the urban fabric we will have been able to isolate from the more modern one. Hyperblocks that still retain the signs of a planned or spontaneous fabric that belongs to other stages of development and that can be highlighted only by separating the alignments and the different plot shapes of the "matrix" urban design from that of the new breakthrough street of the hypergrid. By carefully examining this dense orthogonal mesh, inside the new hyperblock, and by combining this grid with the bands of pertinence of the several paths, it is possible to get back the evidence, albeit in a blurred way, what remains of the ancients urban layers that could have been at the origin of the current form.

Even in the morphological study of Shiraz the traces of the paths that connect the inner centralities with the urban doors of the inner walls town are evident. As in Kashan, it was possible to isolate those paths characterized by greater length and that only occasionally have adhered to the different alignments of the urban fabric. Which cross and connect urban areas, which in turn show the permanence of alignments, with bands of pertinence consisting, for the most part, of rather irregular shaped plots. In a couple of cases and in coincidence with a general orthogonal warping, concave sections have been observed. (Caniggia G., 1976, p. 86).

On the other hand, the behavior observed in the areas belonging to some older streets that specialized in the commercial function is different. In Kashan one of the most evident is that of the bazaar, close to the original settlement nucleus. The section characterized by irregular polygons is placed diagonally to the fabric, instead composed mainly of orthogonal paths and lots along the bands of pertinence (Fig.6). Particle shapes adapted and superimposed on an evident structure on a building fabric that still retains coordinated alignments both to the north and south of the breakthrough street.

In the southern stretch of the fabric of the city of Kashan, a restructuring path is recognizable that connects more external knots and stretched on traces of fabrics still aligned on different manner. While the path that matches the commercial fabric of the Grand Bazaar coincides, roughly with the alignments of the substratum and recognizable in the north-eastern sector of the historic center. Both paths recognized through morphological analysis coincide with the reconstructions made by Kashan historians.

If we do not take into account these different overlaps made in the building fabric, a whole series of paths and bands of pertinence emerge, portions of the path and blocks that extend it within the northern area of the historic town, aligned according to the same orthogonal geometries and which belong to an expansion phase of the town just outside the original nucleus. (Fig. 8).

Conclusions

The paths of restructuring and the topological variants observable in the cadastral urban fabric, if investigated through the regressive method, allow us to reconstruct what Paolo Carafa defines as "the flow of landscapes in transformation" (Carafa P., 2020). Topological variations of the cadastral units of the Kashan and Shiraz have infilled the courtyard house (short) areas that existed in the historical fabric of the city and other time the space of the public way, confirming what the historians of the Iranian city have hypothesized about the different case studies examined.
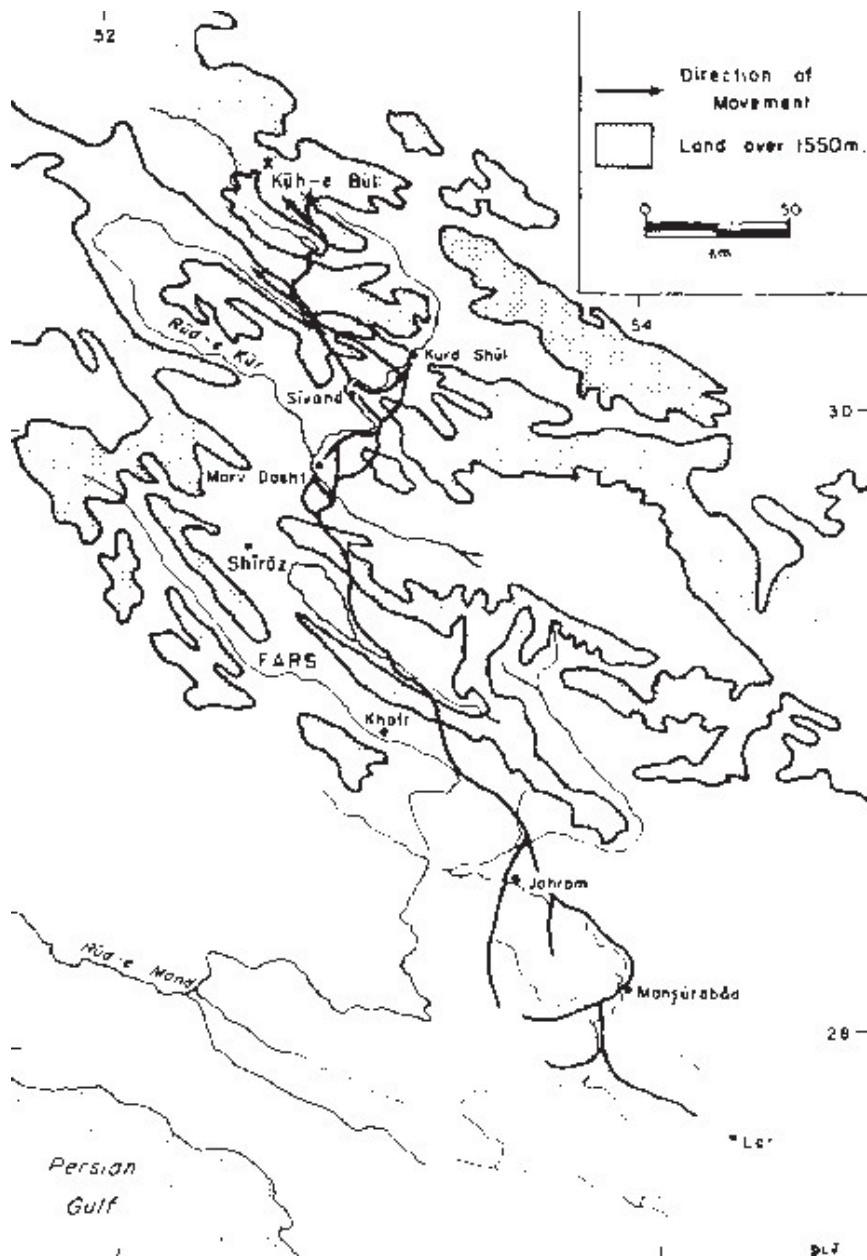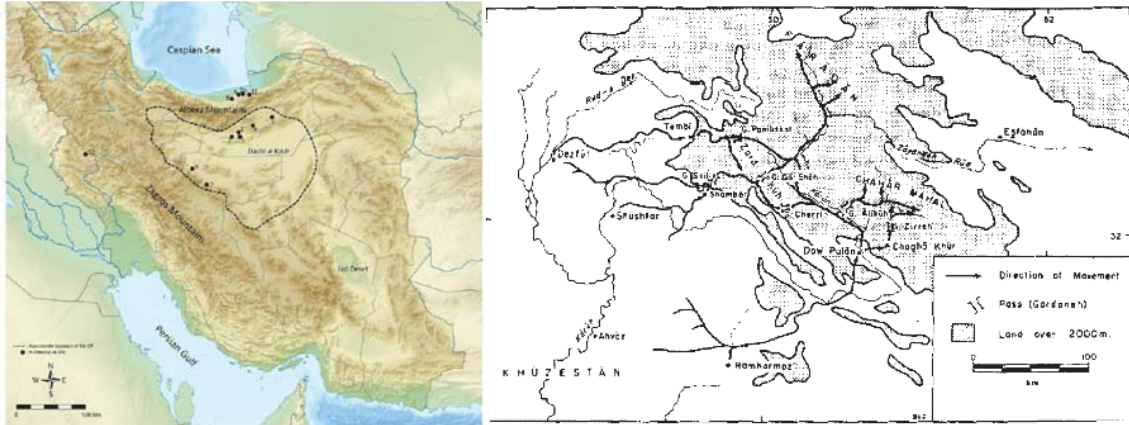
Figure 1-2-3. Iran: Physical morphology and path of trhansumence.
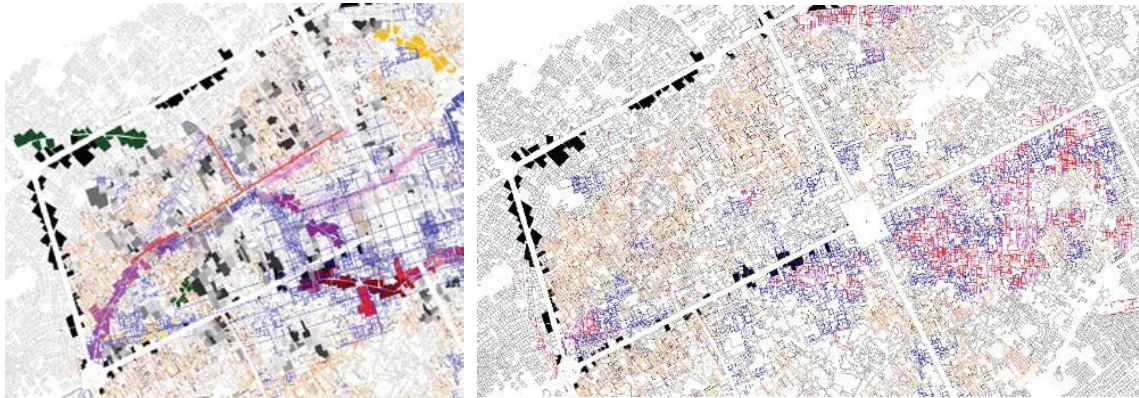
Figure 4. (right) Kashan: Analysis of urban fabric. Band of pertinence of breakthrough street built in different time.
Note the irregular form of the plots;
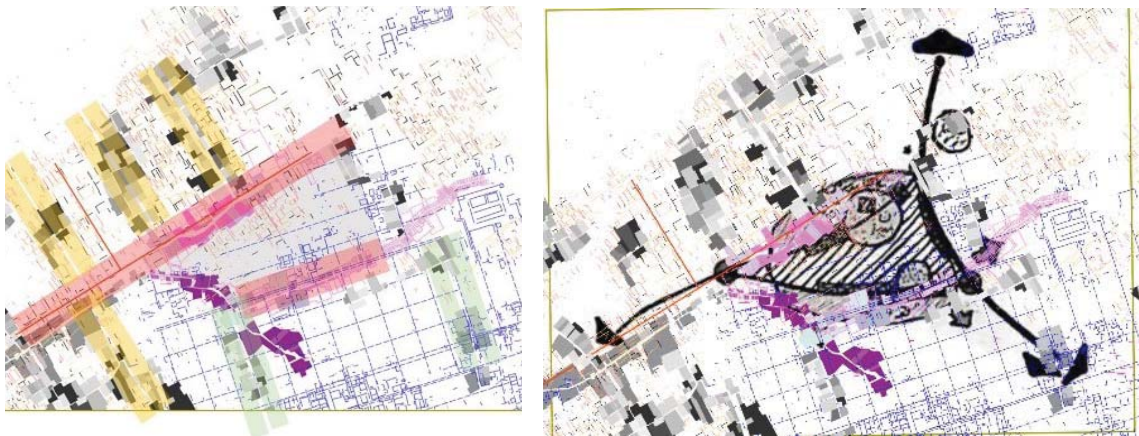**Figure 5.** (left) Kashan: Hypergrid and hyperblock superimposed and alignments of the ancient phases of development.

Figure 6. Kashan: Morphological analysis of the urban Fabric. The drawing superimposed is the historical Hypothesis of the first settlements. The behavior of the plots and the alignment confirm the historical hypothesis
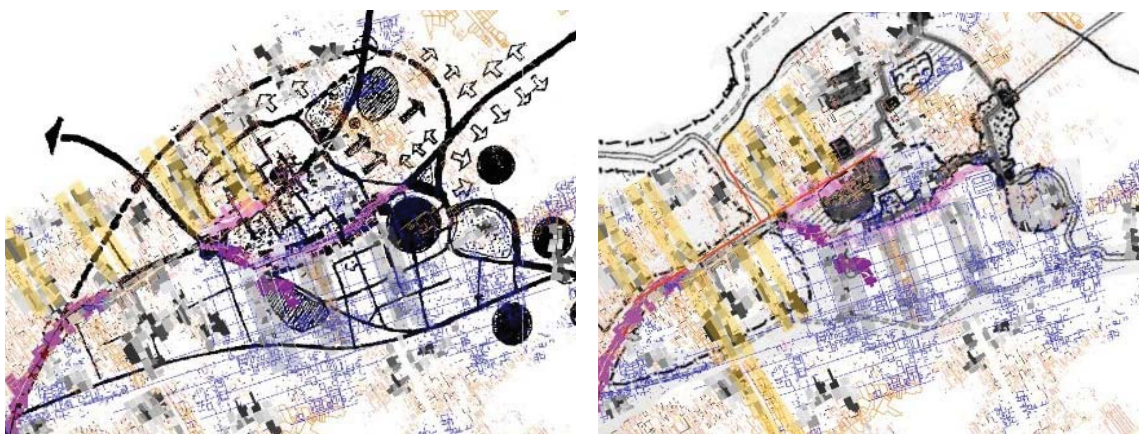
Figure 7-8. Kashan: Morphological analysis of the urban Fabric. The drawing superimposed is the historical Hypothesis of the different phases of the settlement from IXs to XIs. The behavior of the plots and the alignment confirm the historical hypothesis organised with two different alignments at north (light orange) and south (light blue alignment) after the first phase and the further extension of the XIs phase. (Light orange alignment)

Figure 9. Shiraz: Morphological analysis and breakthrough street in between different town wall.

Hydrographic system in historical city of Shiraz

The Main Crossings of the City in Historical Context - Matching the Routes to the
Subterranean Route One Hundred Years Ago

CONTEMPORARY CITY OF
SHIRAZ

HISTORIC CITY OF
SHIRAZ

DRY RIVER

CHANNEL(QANAT)

AQUEDUCTS

THE MAIN CROSSINGS

The location of aqueducts in Shiraz historical context
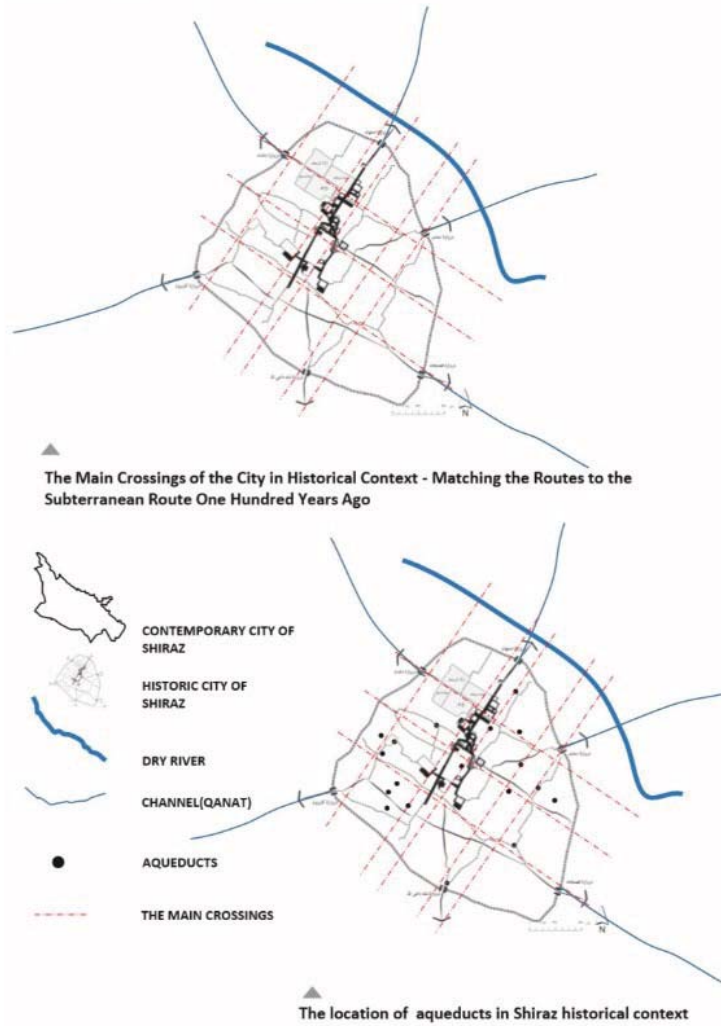
Chronology of the urbanism and the residential architecture of Iran and Shiraz
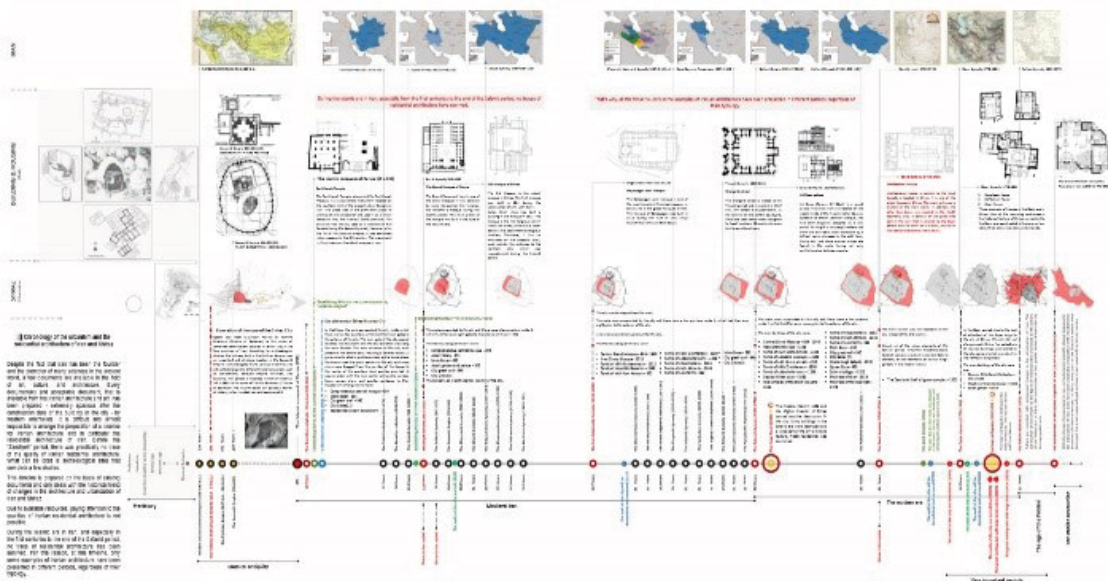
Figure 10. Shiraz: Hydrographic system and Chronology of some historical monuments.

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Lisbon porosity decoding.
Delayering the substrata of Almirante Reis avenue.

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Keywords: *Urban morphology, Delayering, Strata interpretation, Lisbon*

Abstract

The paper addresses the work developed in the first semester of the fourth year design studio taught at the Faculty of Architecture of the University of Lisbon. The pedagogical approach of the exercise is based on urban form reading as the first act of project, acknowledging in the urban fabric the grounding for the conceptual approach.

The valley that is structured by the axis Rua da Palma/Avenida Almirante Reis, constitutes a complex urban territory of the consolidated and diverse urban fabric of the city of Lisbon. Resulting of the sedimentation, overlapping and juxtaposition of strata in the course of time, this urban territory is characterized by a constant dynamic, nonetheless keeping its identity in the context of the city. During the last decades voted to processes of abandonment, it is nowadays a stage for the renovation and reuse of its fabric, constituting a privileged context for the development of the urban design studio academic assignments.

A segmented and decomposed approach to the complex nature of the urban object allows its decoding and renders evident otherwise hidden patterns. Thus, the reading process of the territory is made from the segmentation of continuous linear paths, decomposed according to a set of predetermined systems and strata in the present moment, understood as the result of successive building periods. Interpretative drawings and models are assembled as final elements of the critical reading of the urban fabric, revealing a starting point for the consequent urban projects framed by a common idea that urban life generates from the friction caused by the porosity that is built in the thickness between public and private spaces.

Framing

In the Lisbon School of Architecture, the fourth academic year corresponds to the first year of a specialization after the initial, general and common three years formation in Architecture. In this school year students choose their specialization in Architecture: general, urbanism or rehabilitation. This paper approaches the work developed in the first semester design studio classes of Architecture with specialization in Urbanism of this fourth year. The *Laboratório de Projecto IV* is the first design studio in the course that expressively "aims at the comprehension and intervention in complex urban and metro-politan contexts" – as stated in the official description at the School site. Therefore, the pedagogical approach of the exercise is based on urban form reading and interpreta-tion as the first act of project, acknowledging in the existing urban fabric the grounding for the conceptual approach that directs the definition of an urban strategy and con-sequent development of a specific project that materializes physically the program and aims previously defined.

Thickness and porosity in the Almirante Reis Avenue valley
The place: Almirante Reis Avenue

The necessary existence of a physical complex urban context for the development of the design studio semester work as led to the choice of one of the structuring valleys of the city of Lisbon – the Almirante Reis avenue valley.

This valley, structured by the linear axis of *Rua da Palma* and *Avenida Almirante Reis*, is framed by the ridges that define this drainage basin of Lisbon, a geographical limit, a landscape in the sense of an anthropic landscape that appropriated the supporting territory through mimicking the natural contours between the *Martim Moniz* square – in the south – and the *Areeiro* square – in the north. A complex urban territory that results from sedimentation processes, overlapping and juxtaposition of strata in the course of time. Characterized by a permanent urban dynamic, compacity and overlapping of functions, the structuring axis of *Avenida Almirante Reis* has a strong legibility in the city of Lisbon, configuring the longest straight line of the urban layout. (Fig. 1a)

The urban linear system of the valley bottom shows a wide diversity of building periods and uses, standing out the commercial function, clearly derived from the good acces-sibilities provided by the valley street, the avenue and the subway system. In the last decades, this part of the city underwent processes of abandonment, associated in some cases to the very physical decadence of the built fabric that is still visible, and nowadays is going through a period of transformation linked to the renovation and re-use of the city.

Therefore, the Almirante Reis valley configured for us a representative case study of a contemporary question of both local and global importance, that enables the aca-demical discussion focused on the evolution and transformation of the city in continuity with itself.

The theme: thickness and porosity

When first addressing a place, there is a recalling that establishes connections be-tween past personal experiences and the present experience of the place, in this sense, we might say there is an intuition, an original association given by imagination, that sug-gests a project theme that is already part of the place itself. This theme that generates from a creative association of found elements and characteristics, therefore specific to each place, renders possible to read and interpret a place through a selective set of lenses, enabling a more focused and essential approach.

When walking *Avenida Almirante Reis*, it is quite evident the existence of ground floor galleries in a considerable number of buildings and the role of commercial functions on ground floor spaces. These features extend the public use of space of this relatively nar-row avenue – 25 meters wide – and it is possible to associate this extension and overlap-ping of public use and private space with Giambattista Nolli representation of Rome and the description of Naples written by Walter Benjamin and Asja Lacis.

The representation of the city of Rome drawn by Giambattista Nolli, in 1748, uses the same representation criteria for the public space of the city and for the private spaces

of public use such as churches ground floors or palaces atriums, porticos and courtyards. This plan representation of the city renders in evidence a fluid complementarity between public and private spheres of the city that support the society collective uses.

The acknowledgement of continuities and spatial entanglements between public and private spaces constitutes the key for Walter Benjamin and Asja Lacis definition of Naples as a porous city in 1925:

> "As porous as this stone is the architecture. Building and action interpenetrate in the courtyards, arcades, and stairways. (...) Porosity is the inexhaustible law of the life of this city, reappearing everywhere. A grain of Sunday is hidden in each weekday, and how much weekday in this Sunday! (...) Just as the living room reappears on the street, with chairs, hearth, and altar, so, only much more loudly, the street migrates into the living room." (Benjamin and Lacis, 1925[1978], pp. 163-173)

In the description of Benjamin and Lacis we can infer a complementary opposition between the mineral persistence of the form of the city and the gaseous impermanence of the uses in the city of Naples. These are seen as a reflection of urbanity values that Oriol Bohigas has defined as compacity, overlapping of functions and legibility (Bohigas, 2004, pp. 108-110). Regarding this fact, we must stress the importance of the physical matter of the city, the urbis, as it is what carries its memory and allows its legibility in continuity, supporting the various needs of the successive generations of the civitas.

We might therefore infer that the quality of spaces that stand the test of time is based on the concrete definition of its form and the control of its ambiguity. Spatial ambiguity is understood in this context as the adaptation ability of the limits of the public space to different uses and occupations. The limit is therefore understood as a permeable and adaptable thickness, with a texture that interferes with human movement causing friction and the consequent sedimentation of urban life in these spaces.

In this sense, it was proposed to question through design, in different scales of approach, how the definition of porosity in the apparently impermeable thickness of the built fabric might trigger the "material urbanity" that Manuel de Sòla-Morales wrote about – "Material urbanity, the ability of urban material [the architectural form of the city] to express civic, aesthetic, functional and social meanings" (Sòla-Morales, 2010) – exploring the idea of "relational architecture" (Tuñon, 2015, pp.) expressed by Emilio Tuñon when referring to the architecture of João Luís Carrilho da Graça.

Thickness and porosity therefore constituted the conceptual binomial proposed to conduct the interpretation and design of the valley structured by the axis Rua da Palma / Avenida Almirante Reis.

Reading, Concept and Design

Methodologically, the development of the design studio work was tripartite in Reading, Concept and Design – originally *Leitura*, *Conceito* and *Projecto*. The first phase, the interpretative Reading process is understood as a revelation process that renders evident the relations that are present in a territory and enables the generation of an idea for the project. The second phase, Concept, consists in the exploration of an idea of transformation in continuity with the place characteristics uncovered in the Reading phase. The third and final phase is the Design phase, understood as part of a thorough method that attests or refutes a creative association that aims at revealing the place. Successive redrawing and improvement operations, done in complementary scales, with the aim to materialize the conceptual transformation in continuity.

The paper focus on the methodology and results obtained in the students' work in the initial Reading phase.

Reading the urban form: morphological interpretation
Interpretative drawing

Robert Bresson once said, "Créer n'est pas déformer ou inventer des personnes et des choses.

C'est nouer entre des personnes et des choses qui existent et telles qu'elles existent, des rapports nouveaux" (Chateau, 2012, p.27). A possible inference from this quote for the actions of the architect is that, whatever is the reality we are addressing and transforming, there is the need to know it very well – it is not possible to create lasting relations without a thorough knowledge of the parts.

The knowledge of the territory of the city and its essential need prior to transformation is very well expressed in the words of Bernard Huet: "La Ville est donc à lire en premier lieu comme une archive, non pas pour en retracer l'histoire, mais simplement pour comprendre ce que l'on transforme et surtout pour ne pas faire d'erreurs sur la manière dont on opère, afin de ne pas provoquer une rupture qui ne serait pas inscrite dans les gènes que toute ville me semble posséder" (Huet, 1998). In synthesis, the usefulness of reading the territory is to inscribe the transformation and evolution of the city in continuity with its identity matrix.

An urban territory is a complex object, hard to grasp in its entirety at a first glance. Therefore, as Mario Gandelsonas proposes, a segmented and decomposed approach to the complex nature of the urban object allows its decoding and renders evident otherwise hidden patterns. Drawing is a process that allows us to see formal configurations that are not perceived in reality and therefore affects how we see the city (Gandelsonas, 1991).

In a similar way on how anatomical drawing uses delayering to reveal successive substrata from the skin to the bone, identifying and interpreting organic systems that compose the body, such as the skeleton, the muscles or the circulatory system, we use drawing as a tool not only to design but primarily as a learning and interpretation tool. In our work, delayering is used to isolate urban strata that in a second stage is recombined, allowing to uncover and reveal evidences in the urban object. This process had already proved useful to reveal the ancestral matrix route along the valley line and its duplication (Fig. 1b) operated from the beginning of the XX century by the straight layout of the *Avenida Almirante Reis* (Proença, 2014a, p. 435).

Thus, the reading process of the territory was made from the segmentation of continuous linear paths, decomposed according to a set of predetermined systems and strata in the present moment, understood as the result of successive building periods.

Urban decode

Regarding the urban decode operated by the students, we will focus in the linear path composed by *Rua da Palma* and *Avenida Almirante Reis* to illustrate this decoding method that uses interpretative drawing trough delayering and recombination to reveal hidden formal relations in the urban object.

In this case, the aim was to decode the formal nature of thickness and porosity along the axis, therefore the students synthetized four diagrams to explain formal relations in the avenue.

Each of these diagrams correspond to a specific recombination of layers that were extracted and isolated. The individual representation of each layer considers the same cartographical base at a 1:2000 scale, overlapped on the limits of the street layout, i.e. the limit of the public space of the street, and only two colors of lines are used: black and red. This allows an economical architectural representation of spatial elements

The first diagram (Fig. 2a) aims at revealing the opening processes of the avenue, by overlapping the limit of the urban layout and the plot structure it was possible to confirm where the plot structure was defined simultaneously to the avenue and render in evidence the imprints of the plot structure that pre-existed the opening of the avenue, mainly in the southern part, acknowledging where urban fabric was demolished for the passage of the avenue. An interpretation of "out of the grid imprints" (Proença, 2014b, pp. 40-41) which allows to uncover the longevity of the plot structure and the transfor-

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mation operated by the overlapping of layouts that occurred in the beginning of the XX century. Furthermore, highlighted in red hatch, the evidence of empty or vacant plots and buildings reveals the potential for transformation in continuity with the ancient imprints.

A second diagram (Fig. 2b) addresses the confirmation of an intuition that commerce and services are promoted by accessibility. The combination of the public transportation layer and the commerce and services layer places in evidence the catalyser effect that accessibility has in commercial and service functions. The concentration of public transportation lines, tram, bus and subway interfaces is underlined in red and its relationship with commerce and services, in black line hatch, is evident in this diagram. Even in subway accesses temporary commercial occupations flourish.

The fourth diagram, the Nolli plan of the avenue (Fig. 2d), enables the acknowledgement of some public use spaces, such as the atriums of public buildings and the ground floor galleries of a considerable amount of buildings that margin the avenue. (Fig. 3a)

Furthermore, the large number of commerce and service ground floors together with public buildings, represented in red in the third diagram (Fig. 2c), extend the public use of space and adds up a significant amount of space to the public sphere of the city that is used by people that walk the avenue.

A set of 1:200 street sections and plans were drafted in order to express the relationship that exists between the public space of the avenue and the first compartments of the ground floor which are occupied by public uses, such as commerce or public buildings. The coding of this drawings was also a very simple black line drawing with only two different thicknesses – section and view – that allowed for students to use them as a base for reflection and design. Red annotations on the drawing express the porosity that is found in the thickness of the urban fabric. (Fig. 3b and 3c) The recurrent porosity that was decoded between public and private spaces, both in commercial ground floors and in public buildings, confirms it as part of the character and identity of the avenue itself.

Outcomes

The urban decode enabled students to uncover and understand the urban fabric porosity as a key factor for the urban life fixation in the avenue, using interpretative drawing as an essential tool.

Furthermore, 1:2000 public use models were built of different streets, linear paths along and across the valley, to underline the existing porosity (Fig. 4a). A porosity that was found not only horizontally but also vertically, revealing the underground layers of public use in the subway stations (Fig. 4b).

Finally, 1:100 abstract models of sections of the streets that compose the valley system were moulded in plaster in order to highlight the continuity between public and private spaces and reveal potential relations for the project (Fig. 4c). This coded representation of reality in plain mono material models complemented the delayering process. The complementary approach, in drawing and models, allowed to reduce the complex nature of the city, extracting essential layers for its understanding and aid students to build a method to interpret and also to select the project composition themes by rational abstraction.

In this first semester of the fourth year, the following usefulness of this interpretation methodology is to translate in innovative design proposals based on the codes of the existent city shape. Therefore, these models were both the final element of the urban decode and the initial element for the following design phase of public space project in continuity with the public use of ground floors. In synthesis, this interpretative reading methodology consists on the first step in the quest for a "relational architecture" (Tuñon, 2015). Guided by Peter Zumthor's idea of "emotional reconstruction" (Zumthor and Lending, 2018, pp. 68-69) of a place, the following phases could aim at defining the "material urbanity" (Sòla-Morales, 2010) of public space based on the avenue porous identity revealed and confirmed by the urban strata decode.
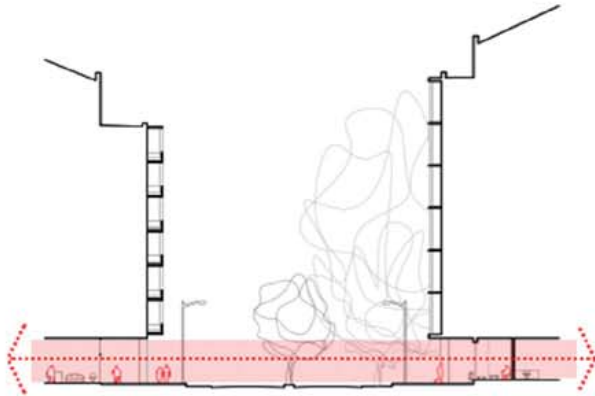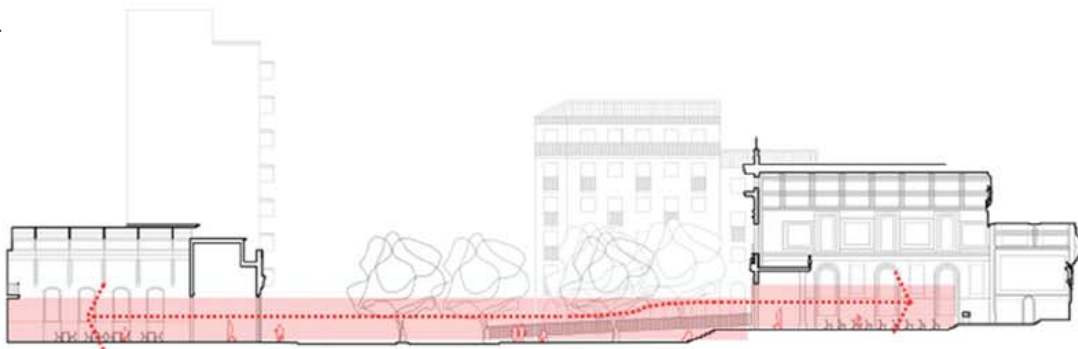
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a.

b.

Figure 1.

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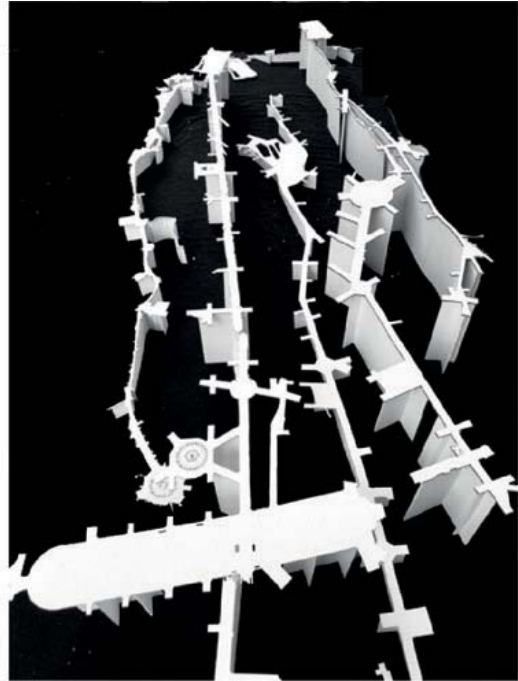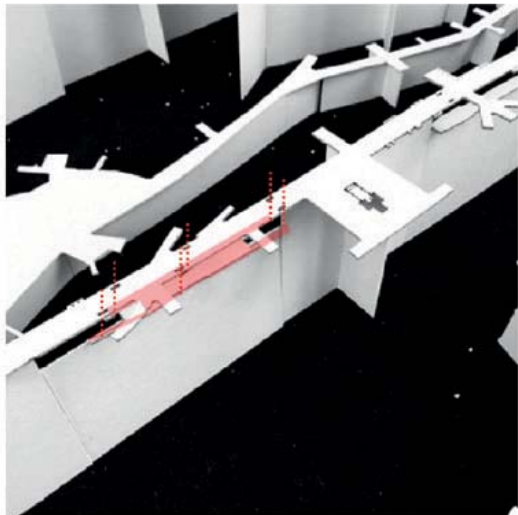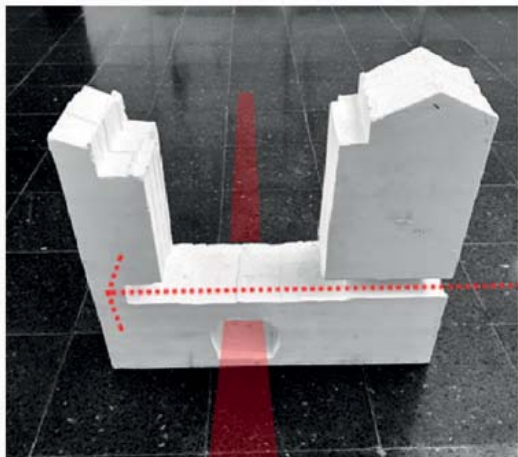
Figure 2.

a.

b.

c.

Figure 3.

a.

b.

c.

Figure 4.

Captions

Fig. 1a - *Rua da Palma* and *Avenida Almirante Reis* axis in the urban layout of Lisboa (*forma urbis LAB* archive).

Fig. 1b - Valley line overlapped on topography of the Almirante Reis valley + valley street and duplication by *Rua da Palma* and *Avenida Almirante Reis* axis identified in the urban layout of the valley (Proença, 2014).

Fig. 2a - Plot structure vs. vacant spaces of the axis *Rua da Palma/Avenida Almirante Reis*. extracts (Urban DeCODE by Ana Berenguer, André Lourenço, Filipa Martins and Miguel Monteiro, 4th year Master in Architecture + Urbanism, FAULisboa, 2019/2020. coord.: Sérgio B. Proença, tutor: Ana Amado).

Fig. 2b - Public transports vs. commerce and services of the axis *Rua da Palma/Avenida Almirante Reis*. extracts (Urban DeCODE by Ana Berenguer, André Lourenço, Filipa Martins and Miguel Monteiro, 4th year Master in Architecture + Urbanism, FAULisboa, 2019/2020. coord.: Sérgio B. Proença, tutor: Ana Amado).

Fig. 2c - Public space vs. street layout limits of the axis *Rua da Palma/Avenida Almirante Reis*. extracts (Urban DeCODE by Ana Berenguer, André Lourenço, Filipa Martins and Miguel Monteiro, 4th year Master in Architecture + Urbanism, FAULisboa, 2019/2020. coord.: Sérgio B. Proença, tutor: Ana Amado).

Fig. 2d - Nolli plan of the axis *Rua da Palma/Avenida Almirante Reis*. extracts (Urban DeCODE by Ana Berenguer, André Lourenço, Filipa Martins and Miguel Monteiro, 4th year Master in Architecture + Urbanism, FAULisboa, 2019/2020. coord.: Sérgio B. Proença, tutor: Ana Amado).

Fig. 3a - Recessed ground floor building with gallery (Armando Serôdio, 1962. Arquivo Municipal de Lisboa: PT/AMLSB/CMLSBAH/PCSP/004/SER/005241).

Fig. 3b - Avenida Almirante Reis section. Public space expansion through the ground floor galleries and commercial spaces. (Urban DeCODE by Ana Berenguer, André Lourenço, Filipa Martins and Miguel Monteiro, 4th year Master in Architecture + Urbanism, FAULisboa, 2019/2020. coord.: Sérgio B. Proença, tutor: Ana Amado).

Fig. 3c - Avenida Almirante Reis section near Anjos Church. Public space expansion through the ground floor of singular buildings. (Urban DeCODE by Ana Berenguer, André Lourenço, Filipa Martins and Miguel Monteiro, 4th year Master in Architecture + Urbanism, FAULisboa, 2019/2020. coord.: Sérgio B. Proença, tutor: Ana Amado).

Fig. 4a - 1:2000 street models - the spaces of public use (Urban DeCODE by 4th year Master in Architecture + Urbanism students, FAULisboa, 2019/2020. coord.: Sérgio B. Proença, tutor: Ana Amado).

Fig. 4b - 1:2000 street models - the spaces of public use (Urban DeCODE by 4th year Master in Architecture + Urbanism students, FAULisboa, 2019/2020. coord.: Sérgio B. Proença, tutor: Ana Amado).

Fig. 4c - 1:100 section model of Avenida Almirante Reis (Urban DeCODE by Ana Berenguer, André Lourenço, Filipa Martins and Miguel Monteiro, 4th year Master in Architecture + Urbanism, FAULisboa, 2019/2020. coord.: Sérgio B. Proença, tutor: Ana Amado).

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Urban recurrences as spaces generators

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Keywords: *urban morphology, tradition, typology, topography*

Abstract

The area of Fontainhas, on the edge of the center of the city of Porto, has been identified as a physical pretext to investigate the possibilities of reactivating portions of the degraded urban fabric starting from the introduction of new forms and programs.

Through the adoption of specific abacuses of generic basic elements as means for both the understanding of the city and the urban regeneration, the work we present is addressed through the division into three macro-areas of investigation, tradition, typology, topography, as distinct themes in continuous relationship with each other.

The study works around the concept of recurrence, identifying both single recurring elements and repetitive aggregation mechanisms within the urban form. These recurrences can be observed, read, analyzed, reworked and placed at the base of the proposal of new urban fabric, which appears therefore in direct continuity with the existing one.

Studying the interaction between form, typology and toppography the project work on the aggregation of the single components starting from a series of abacuses of variation of the recurrent basic general elements, proposing a method extensible to different urban situations.

Framework conditions

Abandoned or underutilized public buildings and facilities, railway yards, disused ports and industrial areas, fragments of cities that no longer reflect collective practices, undetermined boundaries between the city and the countryside represent, even with different scales and characteristics, almost the only areas within which the contemporary project acts.

The scarcity of resources and the consolidation of an ever-greater awareness of the issues of environmental and social sustainability of transformations lead us to imagine careful processes, capable of proposing visions rooted in the specificity of the contexts in which we operate.

In this sense, and in line with the long tradition of studies on Urban Morphology and Building Typology (Moudon, 1997, Conzen, 2012), and aware of the potential that such researches have within the framework of urban reading and the subsequent project in a built context, we focus our interest in the elements of repetitiveness and recurrence in urban morphology, however irregular and disordered it may seem in its constitution and development, as precious instruments for the formulation of new urban fabric.

In particular the work we present aims to discuss the use of a recursive methodology in the process of transformation, from the step of reading of the city to the one of acting on its forms, exploring how to operate through a simplification of complexes elements in the identification of the general basis concepts for their reproduction, in a dimension of continuity.

In order to test our ideas and methods we identified a specific site, a place that has fertile morphological (or physical), social and cultural characteristics. Fontainhas, in the city of Porto, allow us to work on topics like tradition, typology and topography in an exciting cultural frame, in line with the Portuguese's studies tradition on Urban Form and about architectural answers to topographical and social matters. (Barbosa, 2010)

The development of an urban project based on the generation of new urban connections acting on the fragmentation of a portion of the city linking to the existing urban fabric constitutes the framework of our reasoning. The process from the matter to the intentions' wording crosses the theoretical topics, arising as the practical demonstration of the use of urban recurrences. Thus, a single small case become useful to show a methodology and to derive more generic observations on urban form generation, considering the crucial importance and usefulness of the employed instruments and of the built path to reach the aim, more than the final design solution.

Fontainhas (or where we working on)

The area of Fontainhas is situated in a landscape strategical position, because of its overhanging overlooking on the river Douro and on Vila Nova de Gaia and because of its important proximity to the historical city centre and to the charming walking on the riverside. Actually, the western part of the city arrives in this point and seems to be interrupted, suspended in a break with no apparent reasons. In fact, walking the area we observe how the picturesque sequence of spaces and views, that characterize continuously the urban fabric that borders the Douro, drastically cease and the waterfront promenade becomes only a vehicular street, suggesting the passers-by to turn around the area because "nothing interesting is going to happen there". Fontainhas has been defined as a zone between two bridges, an area which seems to be unwanted and unlucky.

The Infante bridge is the rejected bridge, because of the merely infrastructural reasons which led to its construction. The Maria Pia bridge, designed by Gustave Eiffel, is the unused bridge, because it hosted a currently defunct railway. Fontainhas is marked by a strong and visible physical cutting caused by two railway lines, a difficult topography and a deep oblivion.

The improvement in the urban infrastructures and the construction of the Infante bridge, which is manly a fast connections for vehicles, not even for Porto inhabitants, led to the demolition of an important part of the urban fabric in this part of the city and a reduction in life quality of a great part of the residents of the small and quite poor houses on the escarpment. The decadence of the buildings is also due to the initial precarity with whom they were built. This area is also characterized by the presence of a big number of the Portuguese residential building type of the ilhas, which was a residential working-class typology, marked and known

because of its low-quality construction and high degree of abandonment and decay, although presenting a strong attachment by its residents.

The impressive bond of the residents to this kind of houses is a clear indication of their strong traditional sharing social character, strictly linked to the profound Portuguese state of mind.

Like a large part of Porto, Fontainhas is the perfect reflection of the poetic City description made by Álvaro Siza Vieira, when he talks about the hard topography, defining it "demoniac", expressing how hard and exhausting it is to relate and get in touch with it. The narrow and dense urban fabric grows on these slopes, following and indulging its gradient. Open and shared spaces are just derived spaces, created from the meeting of inclined streets, which play that role because people decide it, take over them.

The choice of the area was driven by the possibility to generate a new urban form for the reunification of the divided urban fabric and for the proximity to the historical centre, allowing in this way the reading of the city atmosphere and the reconnection to this urban vitality. These aspects might be summarized by a concept of formal contradiction, used to mean the contrast between a strong fragmentation and discontinuity in the built fabric, and at the same time a recognizing of some continuity aspects, that mark the presence of a certain recurrence and relationship in terms both of time and space.

The residential character of the area enables the study to make an argument on the typological aspects of the city and the way Portuguese citizens congregate and live together. Moreover, the fact that the territory of Fontainhas is marked way by a big change of altitude, hard to be approached and to be solved, it can become through the project as an opportunity to transversally join the territory, connecting not only on the same level, but one level to another.

Working on Tradition

Tradition is set and intended as a reading and a subsequent acting following an approach that is based on the continuity with the past and with the existing urban elements; indeed, this has been based on the reading of the overlapping of basis information of the city useful for the creation of a starting and general point.

Tradition is considered in a strict relationship with the observation of recurrences, of continuative elements, in a dimension of transition and contemporary evolution.

The reading of the main morphological recurrences is then expressed in the generation of new urban morphological recursive elements, which become the key of constitution of the new residential urban fabric, in continuity with the existing one.

The aspects which regulate the city urban fabric, are actually ways of shape creation and they can be read in a physical exploration of the city and graphically understood, in order to become the generative key for the creation of new parts of the city, thus laying in a strict contact with the existing one.

The reading of an urban territory may be approached following a morphological method, understanding the laws which rule the definition of the form, recognising the similar and recurrent aspects given by specific territorial characters. Indeed, through the observation and following reading and analysis, it has been possible to notice how a seemingly disordered and irregular urban fabric is actually characterized by specific elements which are at the basis of their aggregation and conformation.

In the moment of generation of a new part of a city, specifically inside a historic urban fabric, it was thought to be necessary to start from the existing rules, already governing the shapes which are possible to be observed in a preliminary reading.

The survey of the main existing morphological situations brought to the definition of new ones, regarding the physical disposition and way of creation of green areas, streets, walls, squares, urban fabric. The generation of the new recurrent aspects follows the same categories. These elements arise at the basis of the new project, as an abacus of elements of variation of the same topic, as an alphabet of aspects from which to draw in the following step.

At a first sight or walk through Fontainhas territory and during a walk through many parts of the city of Porto, its urban morphology might look spontaneous, unplanned, undefined, which thus would also mean hard to be studied. Actually, each urban settlement follows

precise intentional or unintentional rules, even if not coming from a planning project but from the needs of the territory or of human beings building them. As Marco Romano states, the urban morphology comes from the "social topics", which are displaced on "physical topics" (Romano, 1993). As the society is regulated by rules, defining its structure and the natural territory is regulated by precise and geometric rules which can be studied, so it is for the morphology of the city.

Working on Typology

From the morphological reading of the area, the major typological characters of buildings arise.

The typological analysis was mainly concentrated on the "ilhas" residential social type, because of its particular interest both cultural and morphological aspects. The adopted behaviour has been the detection of the recursive aspects of the city, since the typology itself is an evident element of recursion.

Through the analysis of some case studies, the main morphological features of the type are identified, proving to be worthwhile in the creation of a new typological abacus from which to draw for the generation of the new passages of urban fabric.

The existing surrounding urban fabric is, together with its contextual elements, the central starting point for the followed approach to the city, through the detection of the recursive elements, meaning the types, in the area. The kind of repetition is the same as the one already found in the morphological situations reading, since it is characterized by a replication in a dimension of variation.

The main aspects related to the type and its repetition in the built urban fabric are always strictly linked to the social and cultural main features of the inhabitants and the historical period of their construction. More specifically, the area of Fontainhas is marked by a mainly dense slight urban fabric, scarred by the ilhas phenomenon, meaning that the area was greatly occupied and inhabited by the working classes just moved from the countryside to the city centre for working reasons.

The characterising aspect of ilhas is the inner corridor, which works as a multifunctional space. It is the way to walk from the urban streets to the single accesses of the houses, a ramification of the urban connections, a way to take them inside the blocks. These corridors create a way to let the mobility enter inside the urban fabric, living it in its fragmented nature. In addition to being a connective space, the corridor is an open-air courtyard, a common space daily used by inhabitants as a share extension of their living areas. These reasons are, probably, the ones which make ilhas still inhabited nowadays, being the only typology allowing a shared life in a certain private way. An interesting aspect of this typology is its variability; the first reason is that they were built in interstitial spaces, without constant dimensions, so ilhas had to deal with a certain depth and length of the plot, a certain orientation of the bordering buildings, a given flow of the street and a street frontage (Teixeira, 1992).

At the same time, moreover, in the morphological reading of a building typology, it is possible to identify the social and cultural reasons leading the form to be generated in that specific way, through the identification of specific recurrent elements in the spaces aggregation. Similar aspects and needing in the society may lead to similar morphological features in the building type shape, thus a further repetition also in a different context.

In order to generate the new urban fabric, an abacus of residential types was created, working as an alphabet from which to draw. The basis type is regulated by the same principal laws generating the studied typology of the ilhas, preserving the small private units and the bording shared corridor, originally thought as just a connective space, joining the units, but consequently acquired the function of external courtyard. The creation of the morphological rules of the basis type then flows into the dynamics of the type composition approach. The scheme is shaping up to be the starting point for the aggregation of forms, based on the already seen morphological urban recurrences.

That turns out interesting and efficient in the typological approach, after the reading of the existing typologies composing the urban fabric, is a dynamic process for making it change in a new type, a concept that stresses again on the element of variation in the repetition. With dynamics we mean that, after a classification of the existing types, the work moves on

the variation of the form, meeting the new requirements of the developing design.

Having to insert in the new topography and to create the new connections in the area of Fontainhas, the type changes above all in its orientation. The corridor, which here becomes a real liveable and agreeable courtyard, is rotated and placed along the same street.

This allows the courtyard having a more open and direct contact with the street, not being hidden in the inside of the block, but in the continuity of the sharing atmosphere of the residential type.

As mentioned above, morphological characters and spaces disposition in the residential typology lay in a strict contact with the social reasons and the construction work flow of the type itself, as it has been possible to analyse through the reading of the traditional ilhas type, whose morphological nature cannot be explained without considerate its social, cultural, historical background.

The new residential type, that we propose, is a consequence of the just expressed process of variation and dynamic action on the traditional typology of the ilhas. It still preserves a character of intimacy, in the private living or working unit, but it presents a strong sharing character in the rest of the building, which therefore means in the fourth shared unit and in the outside courtyard. This coexistence of private/intimate and social/sharing has already been found in the basic typology and in the analogical ones that have been found in the other contexts. (Buarque,1995)

The social nature of ilhas, which are still lived as they were at their origin, so with a prevalence of use of the outdoor shared spaces and of the street, is still permanent in the new type. The contact between the courtyard and the street is very tangible, allowing a kind of life which shows a local and a neighbourhood style, that does not want to hide from the street, but always show and invite, in this case differentiating from the traditional typology of the Portuguese ilhas.

The variation of the traditional type allows an increase in the contact with the street, through the rotation of the units and courtyard from perpendicular to parallel with respect to the street; the nature of the correlation type-street is modified, from more intimate to public, which is the index of the changing process from totally residential to the semi-public of the new typology. The corridor is not a corridor anymore, as it becomes a real and effective courtyard for outside activities, but still covering the role of distribution from the entrance on the street to all the units.

Working on Topography

The area of Fontainhas is the manifestation of a difficult topography, characterized by the hard slopes, which are actually largely diffuse in the whole city. The carried-out work analyses the theoretical relationship between architecture and ground. The way in which the architectural object interacts with the ground tells about the theoretical and conceptual meaning of that architecture.

The topographical reading of the territory found the action of particular topographical devices as intermediaries between the artefact and nature as the site accommodating it. In the design, the architectural objects get in touch with the ground through the intermediary action of topographical devices (Berlanda, 2014). Through the observation and reading of the architectonic aspects, some elements are identified as the means for architecture to answer to the topography: Walls, Platforms, Stairs, Ditches are characteristic elements of this panorama, coming from a, it could be said, structural and needing reason. Although the reason is structural, it is evident how these elements answering to topography unleash a series of social and activity situations.

As morphology, so topography should be studied from a possibility in transition perspective, through the highlighting of the changing and evolution aspects. The interesting and stimulating feature of topography is its changing in time. In the project, topographical features and difficulties become the starting points and strength features for the design, in the same way it has already been done with the traditional and typological field.

The design at this point inserts an object which arises as an intermediary, allowing the type to enter the ground in a light and reasoned way. The elements we just studied and surveyed as recurrent in the landscape of Porto are schematic and made simple objects, until

becoming four basis devices. The typology clings to them, fixing themselves to the ground. Walls, Platforms, Ditches, Stairways are both structural and social elements, so providing new liveable spaces.

The point of contact between architecture and the ground is extremely crucial, as a matter of fact, the ground gives its own contributes to the variation, because of the different kind of intersection with the type. Indeed, the degree of inclination of the soil influences also the position of streets, thus the orientation of entrances and the aggregation of the single units and their relationship with the courtyard and the street.

The presence of the just explained topographical devices is the mean allowing architecture interacting with the ground and change, getting in touch with the topography in different various modalities, first modifying in section and meanwhile and consequently in plan disposition.

The type still based on the same constant generic rules change, according to the surrounding buildings it has to get in touch with, according to the different elevation gain it has to fill, according to the streets orientation and the needing for the accesses orientation, the necessity of space dimension and the kind of activity it has to host.

Thus, the elevation gain of the specific site hosting the new type is a variable which leads the type to adapt, to change in order to position itself on the ground or inside of the ground. The topographical matter and the architecture object enter inside of a shared experience, writing together the way to create the interrelationship.

Retaining walls, basements/platforms, ditches and stairways are set out as means, intermediaries to reach a typological change in the point of contact with the soil. They moreover become further objects of sociality, adding shared outside spaces or paths to the residential areas.

The beginning alphabet is changed through the introduction of the topographical devices as variation and dynamic devices. In addition to the morphological division of types, it is added the syntactic division and variation, meant as the way used to enter the soil, to ground on the earth.

Conclusions. Working on transition

As we see in the previous paragraphs, urban forms and building typologies, even if accorded to the same rules, are declined in various ways because of the factors acting on them, as the context, the overlooking on the street, the internal paths, the number of units needed, the orientation, the difference in altitude, as so the ruling model that we assume for the generation of new types is therefore declined in various ways.

The topographical variation is one of the main factors which act on this dynamical modification of the type, promoting transition. The same type on its own, in fact, assumes different morphological sense and physical configuration according to the exact place where it is situated, attributing more and more importance to the site. The topographical characteristics are, in fact, probably the most important and biggest variant of the site, which as a matter of fact greatly influence the conformation of the building, also depending on how it goes to insert itself in the land and ground on the welcoming soil.

It could be stated that the difference in topography entails a forced typological variation, because of the needing to relate to a certain level of the street, a certain height difference, so this brings to a level change, to an accesses change and finally to a real morphological change. This variation is not left to chance, but it is strongly regulated with the basic recurrent elements.

Through the reading of the city and of the territory and the interpretation of the main components of the site, understanding the relationships between spatial objects and social ones, it is possible to create new transformation scenarios, acting on the process of the morphological and the social factors.

The just shown project strategy makes use of certain particular recurrent elements, taken from the city itself, already lived by citizens and visitors, already working well with a certain way to live and inhabit them.

Moreover, the urban design, which is different from the urbanistic planning, is considered as the definition of specific basic morphological/ social rules as a starting point for the single

architecture projects.

The relationship between morphological and social is actually extremely strict, since the physicality of a place actually comes from its social features and from the exigencies of the population inhabiting it. Thus, the rules lying at the basis of urban morphology ensure a syntactic order to the urban fabric. Indeed, they are the demonstration of the intentionality in the generation of new urban form, which is not constituted casually.

The process of abstraction of the morphological and physical but also typological and topographical situations, when it has to do with urban designs, allows the generalization and thus the creation of generic rules, applicable to different areas and scenarios.

The direct consequence of the existence of this social-morphological connection is the continuous mutation of urban forms because of the continuous mutations of the society.

The group of people inhabiting a city changes, thus there is not an irreversible urban form, but a transitional one.
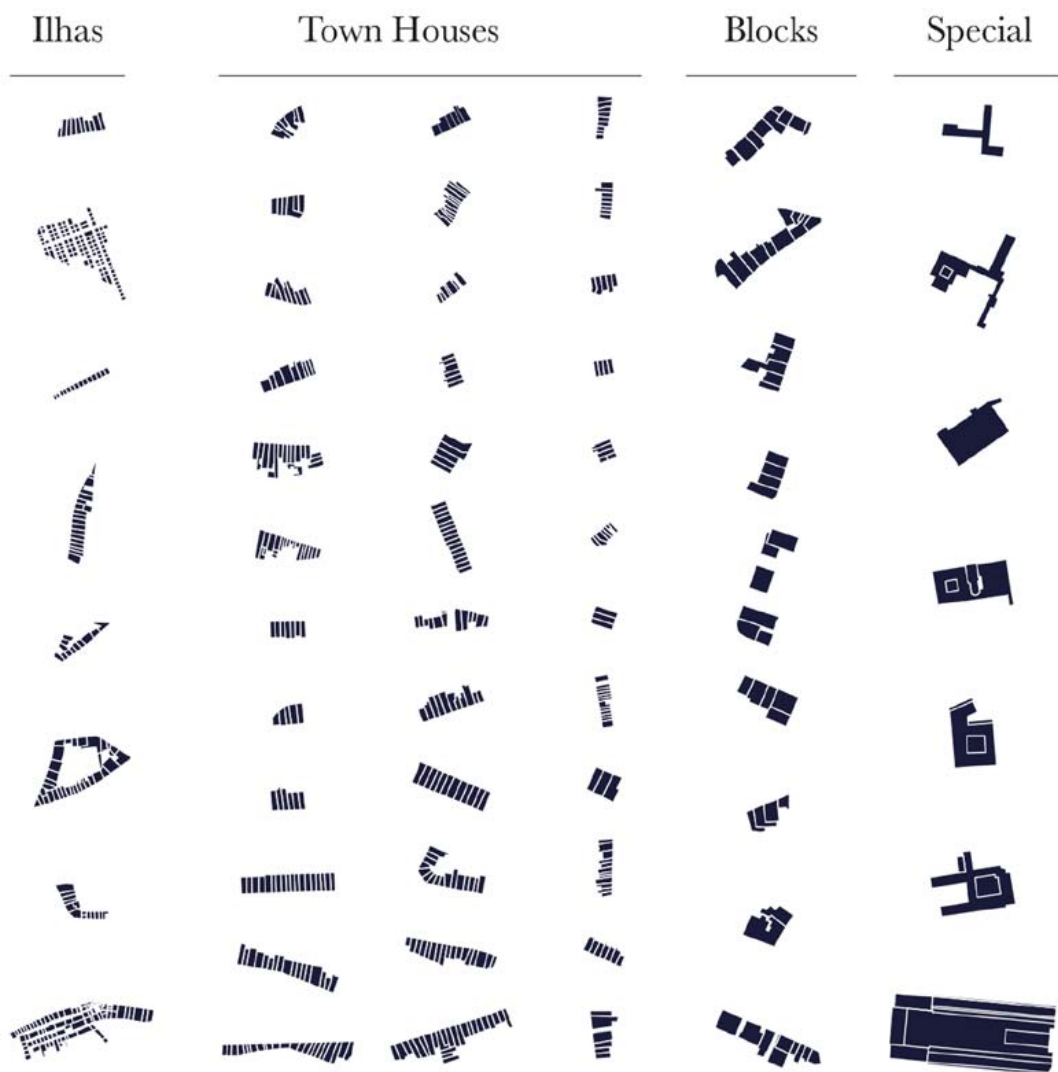
Figure 1. The abacus of the recurrent typologies of the area surrounding Fontainhas.
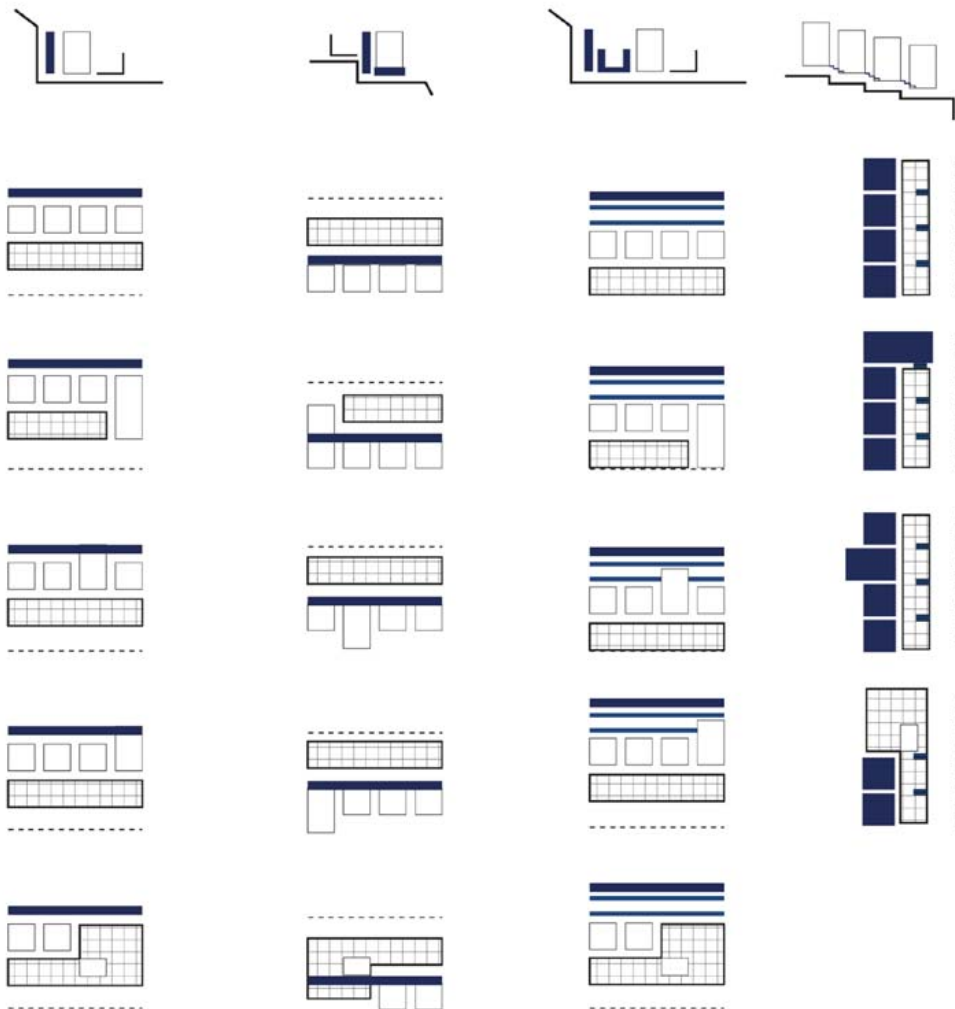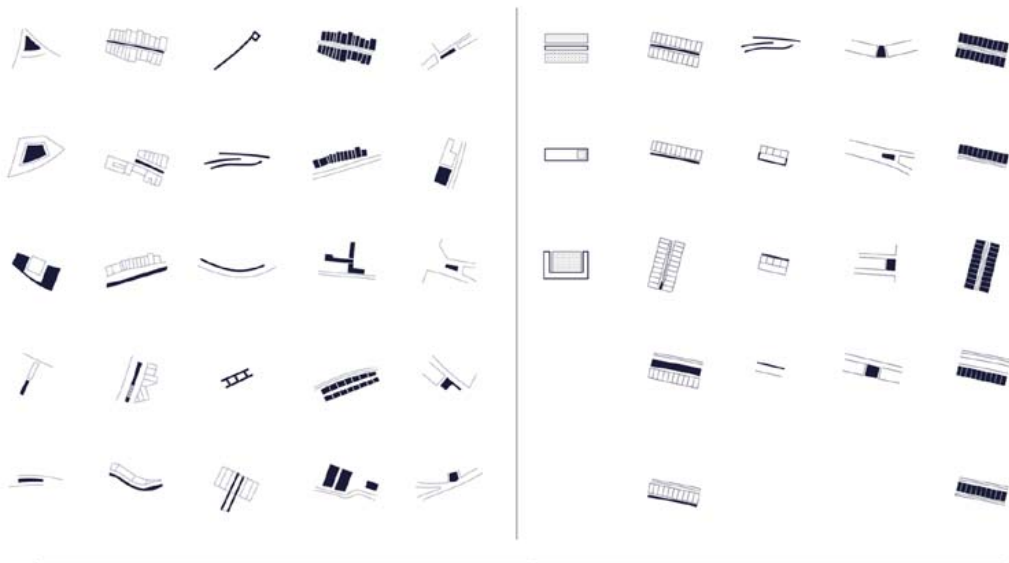
Figure 2. The abacus of the recurrent morphological situations;
Figure 3. The abacus of the new recurrent morphological elements;
Figure 4. The abacus of interaction between Typology and Topography.

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Landscape analysis for digital description of urban morphology of Upper Kama region towns

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Abstract

Digitalization of survey and conservation methods of architectural and historical monuments expands the possibilities of documenting environment and the landscape analysis. Combination of research methods allows to clearly represent architectural environment. The creation of collected data structure and put it into entire database is a necessity for later use of information. The formalization of information is the part of the process of database creation. The article describes the process of landscape analysis in order to create a database. Some results of landscape-visual analysis carried out for the cities of Cherdyn and Usolye, which are located in Perm Region, Russia. Cherdyn and Usolye are the old towns with great historical background. Usolye is located on lower river bank and consist of different condition monuments of 19th and the beginning of 20th centuries. Cherdyn is the city on hills has orthogonal structure. The preserved blocks of urban structure are including monuments of 19th century as well as new buildings. Different urban structure allowed testing the survey approaches for varying research scenarios. The initial principles of cataloging the data are presented in the paper. The described experience allows us to estimate the amount of collected data. digital 3D models obtained by laser scanning and photogrammetry together with tradition survey give the most complete digital model of the historical parts of the city.

Introduction

Digital technologies for documenting the urban environment allow you to combine different tools and technologies for data collection. For historical cities, which usually have accumulated a large amount of descriptive, graphical retrospective information, data obtained by modern digital survey tools, methodological approaches to systematization and cataloging of information play an important role.

Upper Kama (Verkhnekamye) is a unique phenomenon at the crossroads of different cultures. The culture of the upper Kama region has absorbed the national features of the pre-Christian period in the Urals, Russian historical and cultural heritage and European traditions.

Cherdyn and Usolye are old cities with a great historical past. Usolye is located on the lower Bank of the Kama river and has various monuments of the 19th and early 20th centuries. Cherdyn is located on seven hills on the Bank of the Kolva river, which makes the scenery around the city even more picturesque. The remaining blocks of the city structure include 19th-century monuments, as well as new buildings.

The different morphological structure of these towns requires different approaches to the survey of the urban environment formed in the 17th and 18th centuries on the rivers banks. In this paper, we tried to develop principles for cataloging data obtained by landscape-visual analysis of various morphological structures, in order to integrate them with data obtained using digital survey technologies (laser scanning, photogrammetry).

Research methods

The methodological approach of morphology describing was based on the SAVE (survey of Architectural in the Environment) (InterSAVE, 1997) methodology and the requirements of ISO 21127: 2006, which regulates the exchange of information about cultural heritage.

The strategy of collecting information about cultural heritage sites, the principles of cataloging and integrating the results of digital survey of the area were based on the results of research by S. Bertocci (Porzilli, Bertocci, 2019), S. Parrinello (Parrinello, Picchio, De Marco, 2019), F. Remondino (Rupnik, Nex, Toschi, Remondino, 2018), and others. The models they obtained most fully reproduce the morphological complexity of urban space.

Methods for collecting information about coastal areas included landscape and visual analysis, photo-recording, field surveys, and creating spherical panoramas.

Spherical panning, unlike a normal panorama, gives an idea of the selected location with the ability to rotate around the shooting point by 360 degrees. The technology of creating spherical panoramas does not require a special camera with the ability to shoot 360 degrees, just a normal camera and a tripod. Subsequently, images are processed in the PTGui program.

Panoramic images were analyzed in three positions:
- visibility of architectural monuments and dominants
- view of the natural landscape;
- panorama color scheme

In the analysis of coastal areas were classified in the coastal areas and the definition of visual and physical connections, identify patterns of existing Hiking trails, collecting materials for the development of water tourism routes.

Simultaneously with the search for viewpoints, a study of impressions was conducted, which were recorded and made out in the form of a map of impressions (views, smells, opportunities to pass, landscaping, etc.)

The data collection structure is shown in figure 1.

The digital catalogue is a collection of thematic charts and maps created using geographic information systems (QGIS, ArcGis). Given the important role of the coastal landscape, thematic maps were focused on its description. The following parameters were taken into account: physical and visible borders, functional zoning of the territory, and color characteristics of the environment. Mapping allowed us to determine the location and nature of the viewpoints needed for making tourist routes.

Landscape analysis for digital description of Usolye urban morphology

Usolye is located on the Kama river bank like many settlements in the Perm region. In the 1950s the historical part of Usolye was flooded by the Kama reservoir, which was formed during the construction of the Perm Hydropower station.

Now the historical part of Usolye is connected to the coastal part of the town by a dam. During the spring flooding this part of the town turns into Islands. Preserved architectural monuments are gradually being destroyed, as they are located on the coastal territory in the flooding zone.

Despite on the fact that there are many historical, geographical, and engineering studies about Usolye, all this information is scattered and located in different departments, often in "paper" form. Therefore there is not possibility to form the basis of scientific monitoring as result it complicate the design and planning of restoration work.

For the convenience of collecting and organizing information about Usolye in a digital database, the entire territory of the historical part was divided into several zones: Rubezhskaya, Kapustinskaya, Nizovaya, and Posadskaya, each of which was assigned its own code presented on figure 2. The analysis takes into account the relationship of land and water, the legal forms of land plots, the height of the shore, terrain, vegetation, the presence and condition of buildings, and the presence of paths and roads. Based on these parameters, each zone is divided into subzones showed on figure 2.

Rubegskaya part is located in the North historic Usolye (figure 3a). Today, there remain only one building which is a monument of architecture – Rubegskaya Church. The facades of the Church are partially hidden by poplars; however, its bell tower remains the main high-rise dominant. Swamps and swampy areas form natural landscapes here. There are four main monuments in the Kapustinskaya part: the St. Nicholas Church (figure 3b), the rectory and farm buildings.

In the Lower part (the southern part of the island, figure 3c) ruins and remnants of infrastructure have been preserved. They can be divided into three categories: buildings, artificial shoreline, and infrastructure elements. The Posadskaya part is located on the center of the island. Here are situated the best-preserved architectural monuments: the Cathedral, the bell tower and civil buildings that form the basis of the Museum complex (figure 3d).

The possibility of using the coastal space was determined by assessing the availability of the shore from both water and land. During the survey of the banks, the density and height of vegetation, the ability to walk along the shore without special clothing, the ability to swim up and dock to the shore were noted.

In each of the sections shown in figure 4, the relationship between the shore and the water was considered: the height of the shore, vegetation, distance of paths/roads from the water, and the possibility of approaches to the water.

The study identified four types of coastal spaces at the water-land interface:
- the Bank is flat; the view of the water is blocked by bushes, tall grass or trees;
- high Bank; it is impossible to go down to the water; gently sloping Bank with direct unobstructed access to water;
- the Bank is flat, low, part of it is flooded or swampy.

All the information received is reflected on the availability map. The shoreline analysis is displayed on the map using different line colors using GIS presented on figure 5.

Three types of terrain were marked on the Usolye impressions map:
- area with good rich views, with good accessibility, without negative emotions;
- easily accessible place to relax ;
- place inaccessible, noisy, causing any negative emotions.

Inaccessible areas (fences, fences, tall bushes, and grass) were mapped as physical boundaries (Figure 6).

All information is collected in the appropriate inventory card. The example of the card is shown on figure 7.

Landscape analysis for digital description of Cherdyn urban morphology

Cherdyn differs significantly from Usolye in its planning structure. The historic quarters of Usolye is lost as a result of historical cataclysms. Cherdyn retains original layout grid. Therefore the first step of landscape analysis in Cherdyn was the study of its planning structure.

The analysis of the planning structure and building typology was based on maps of actual land use. In the center of historical blocks undeveloped areas were formed as a result of changing the boundaries of land plot. It led to the loss of the integrity of the planning structure. The destruction of the intra-district grid in the central part of the town led to a deterioration in the perception of the architecture and landscape of the town as a whole.

The central part of the town is built up with stone 1-2-storey buildings for public, cultural, commercial, and residential purposes. Based on the analysis of the building typology nine types of buildings are identified that differ in material, location of the main entrance, location of the courtyard: wooden, stone, combined stone-wooden, mansions, etc.

To organize the database, buildings were systematized according to their compositional role in the environment: urban and local dominants, environmental objects, and objects with architectural (silhouette, plastic, and coloristic) accents (figure 8).

The connection of the town with the river is actually only visual, since the town is located on the high banks of Kolva river and has the only road to the river that has been preserved since the 18th century. On the plan on figure 9 showed the existing visual and physical connections of the town with the river. Obviously, access to the river is limited, but there are many places where visual connections are provided.

Figure 10 shows the main viewpoints of the city with a description of their availability, viewing angle, type of landscape picture.

Systematization of landscape analysis data in Cherdyn was carried out based on the existing planning features for two types of urban fabric: city blocks and territories with a predominant landscape. Three types of morphological zones were identified: 1) blocks of the historical core; 2) blocks of the central part adjacent to the historical core; 3) coastal territories (figure 11).

The first two types: the central historical core and the neighborhoods adjacent to the central part are formed by an orthogonal grid. Considering its ordered structure each quarter receives a number in accordance with the cadastral quarter number.

Each block considered adjacent streets and its longitudinal profiles are created (figure 12). The longitudinal profiles allow to capture the scale of buildings, the color scheme inherent in this block, as well as dissonant elements. Dissonant elements can be both individual objects of the urban environment (lamp posts, advertising signs), and buildings are distinguished by style and color solution.

The next step in the inventory for the first two types of morphology is to create a function map. Such a map can be created automatically using GIS, if inventory maps for individual buildings in the block includes tables of the address of the building, its function and code have already been created.

The third type of urban fabric is coastal areas that are inextricably linked to the surrounding landscape. Terrain features and the predominance of visual connections over physical ones determine a specific approach to the information collection system. The study of these territories is carried out in enlarged blocks and the division of coastal territories takes place in accordance with the terrain, conventional and physical borders, and roads. The inventory map is supplemented with text characteristics of the territory indicating the plot, center, foreground, backstage, etc.

Collected data systematized in accordance with the plan on figure 13. Perceptual landscape-visual analysis data combined in inventory maps are integrated with data obtained using ground-based laser scanning and photogrammetry. (Grushin, Sosnovskij, 2018)

Digital 3D models obtained by laser scanning and photogrammetry together with traditional photography provide the most complete digital model of the historical part of the city.

Traditionally point clouds are converted to vector objects or other data types for further processing in the CAD and GIS environment. However, they can be used for estimating the volume of complex objects, linear measurements, visibility analysis, insolation and aeration, 3D visualization, and other. Applications for web-visualization of point clouds that use WebGL has recently become available. Examples include Plasio (http://plas.io/) or Potree (http://potree.org/). (Abdul-Rahman, 2017)

These applications require a certain amount of hard disk space when creating a local server or using a web-server (figure 14). After that you can view a three-dimensional point cloud through the link system. Links can be included in the database via an additional row in the inventory map, which allows you to link point clouds to two-dimensional data or metadata.

Conclutions

At the stage of choosing a combination of methods for documenting architectural heritage is necessary to have a detailed understanding of not only the typology of the urban environment, but also the typology of digital documentation and the data formats obtained using various tools.

The formalization of the information and the structure of its collection system allow us to develop a multidimensional database of complex morphological fabric of historically developed landscapes. Differences in the urban structure of Usolye and Cherdyn allowed testing approaches to the survey in two types of urban conditions. At the same time, the presented technology of digital landscape documentation allows creating a flexible database structure depending on the morphology of the territory with a single approach to documentation.

Acknowledgements
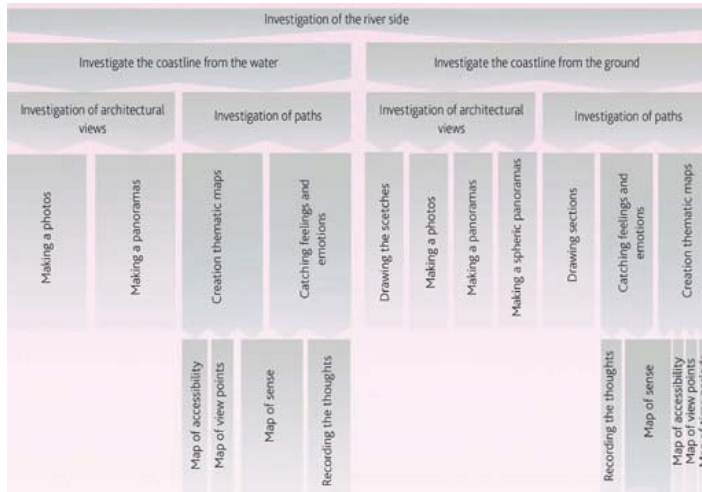
Figure 1. The scheme for the study of coastal areas.
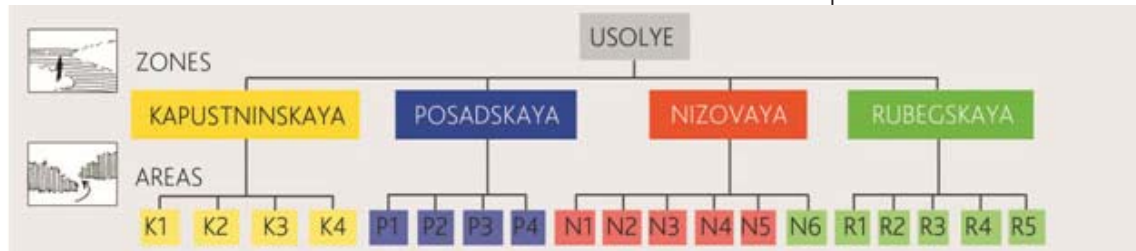

Figure 3. Zones of the Usolye historical part.

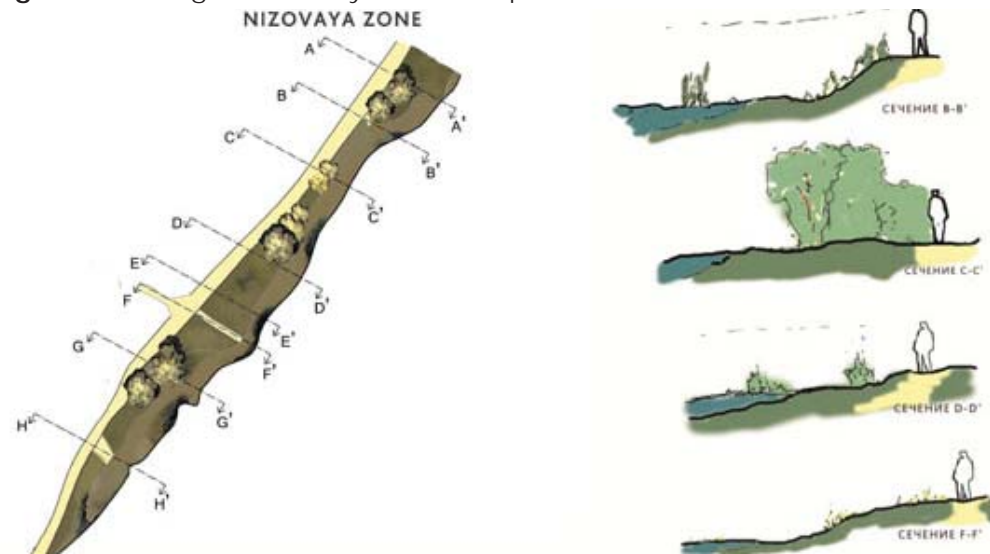**Figure 2.** Coding of the Usolye historical part. Where 1,2,3,4,.. – the numbers of zones.

Figure 4. Analysis of coastal spaces.

Figure 6. Analysis and map of physical boundaries.
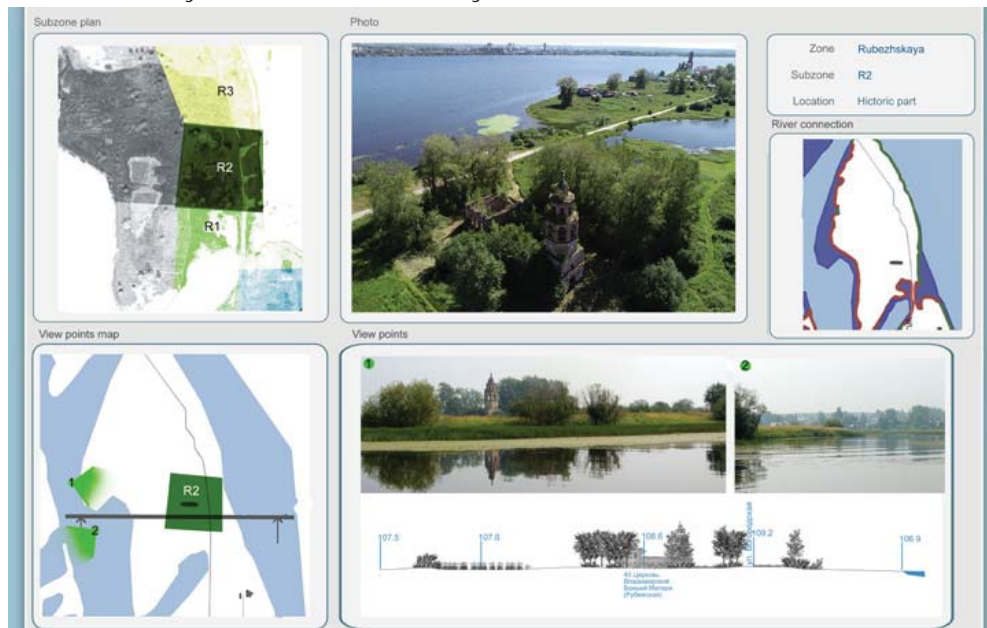
Figure 5. Accessibility of the coastline. Usolye.
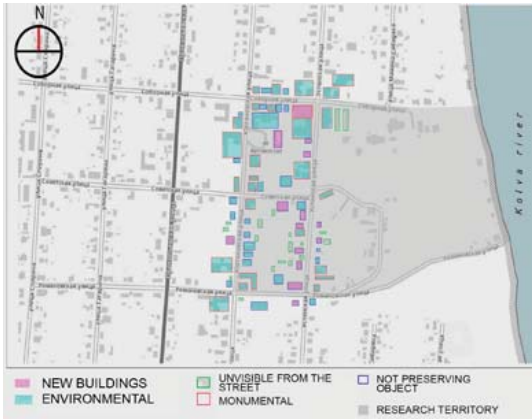

Figure 7. Example of an inventory map for the R2 zone.

Figure 8. Distribution of buildings by their compositional role in the urban environment.
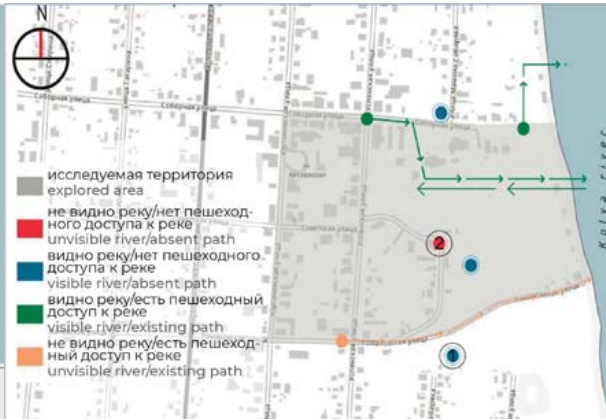
Figure 9. Connections of the study area with the river (visual and physical).

Figure 10. Viewpoints of the Central part of Cherdyn. Green indicates viewpoints with approach paths, and red indicates viewpoints in a hard-to-reach location.
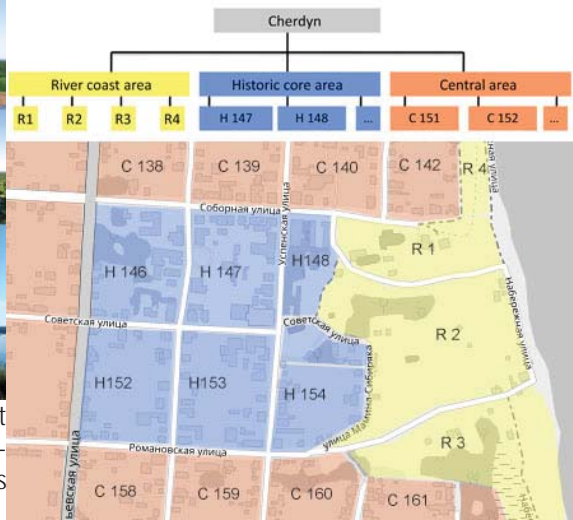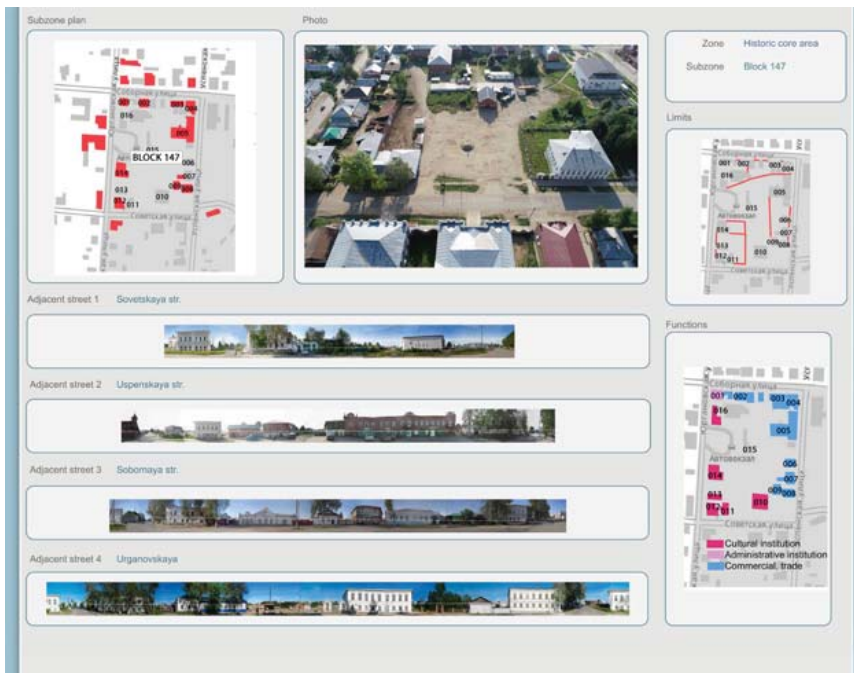

Figure 11. Coding the territory of Cherdyn.

Figure 12. Example of an inventory map of a block of a historical core block.
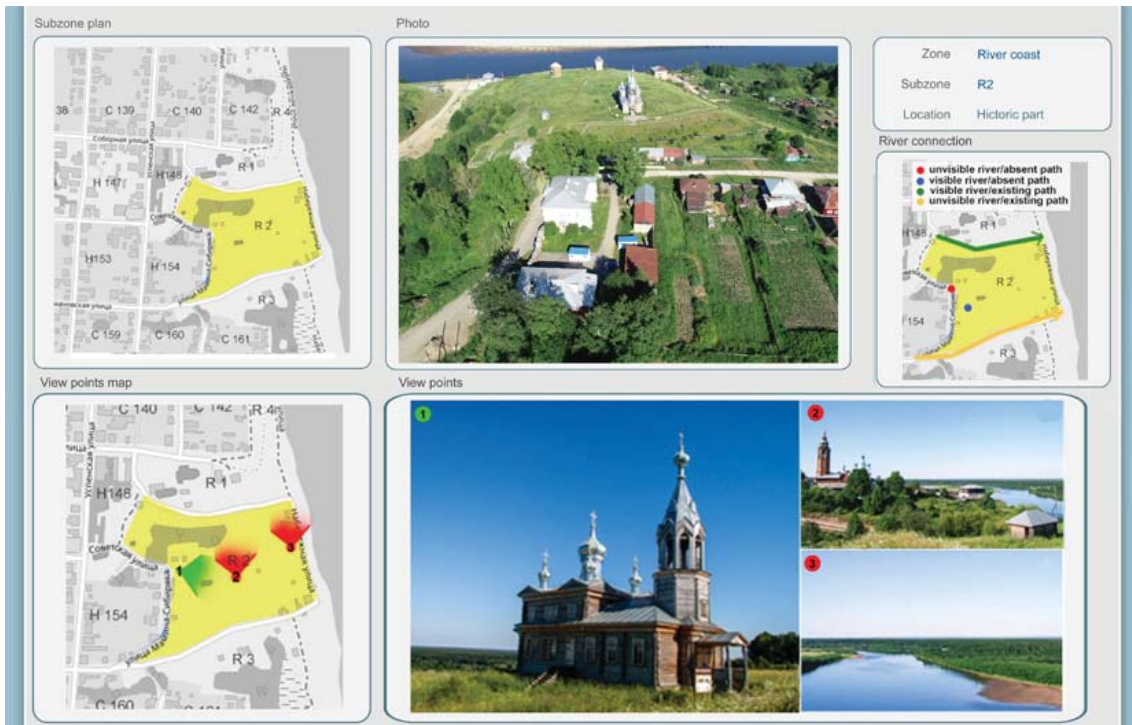
Figure 13. Example of an inventory map of a coastal landscape subzone.
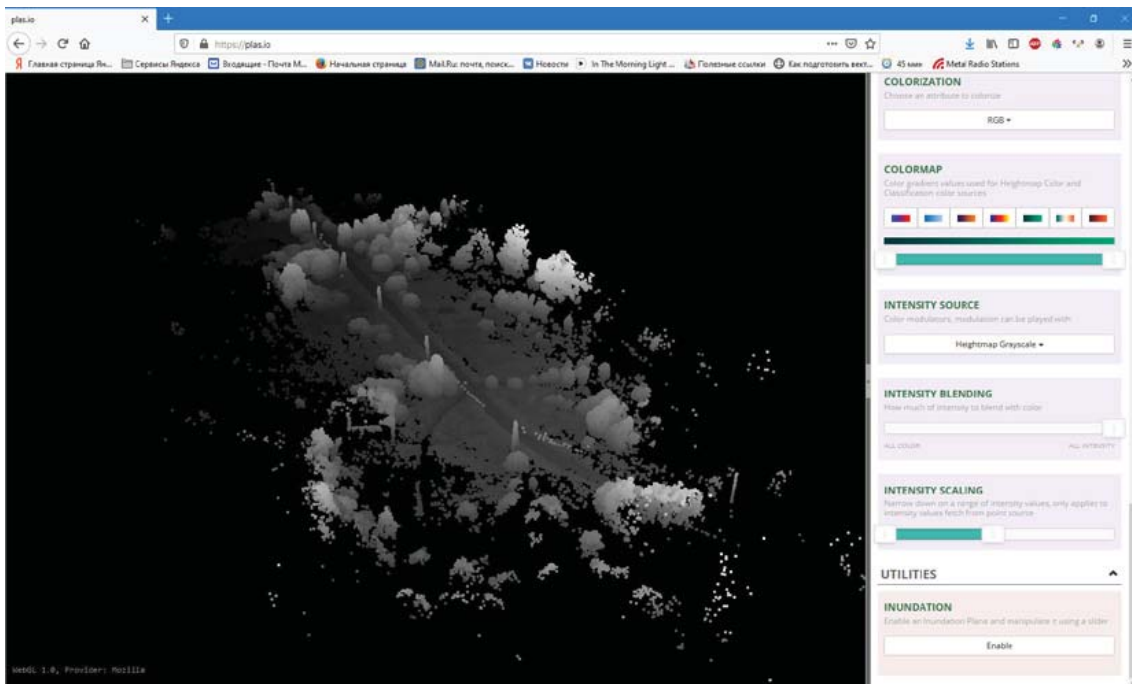

Figure 14. Visualization of the landscape point cloud using the KAARTA Stencil 2-16 portable laser scanner using the service potree.org

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Morphologie des écoles primaires québécoises : Débat entre le modèle, le type et le projet d'architecture des écoles d'après-guerre

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Keywords: *Elementary Schools, Morphology, Configuration, Program*

Abstract

Elementary school education became mandatory in Quebec in 1943. Consequently, by 1948, a massive construction wave of new schools was undertaken in cities and suburbs, both growing as a result of post-World War II economic prosperity. Of the 2330 elementary schools that exist today, about 50% were built between 1948 and 1965. Only 20% were constructed before 1945. Today, authorities estimate that 70% of Quebec's elementary school buildings are dilapidated and require major renovations.

The National Archives of Quebec preserved the model plans for school design that were commissioned by the Department of Public Instruction between 1948 and 1963. This presentation explores the morphological characteristics of these school building types through their plans and drawings, their construction and their programme configuration. This analysis also examines some case studies with their implantation in an urban setting and their evolution over the last seven decades.

Behind the project endorsing public elementary education for all, the schools' architecture reveals discrepancies between the Protestant and Catholic systems, disparities between regions, cities, towns, villages and the countryside, and inequalities in the resources and means of construction of school buildings. Furthermore, the compulsory standard plans generated conflicts with the architects who saw unfair competition as well as an incomplete solution. This argument underlines the recurring architectural debate about the weight of the model, the type, and the architectural project.

The Colonial Logic of Elementary Education

The plan to provide public elementary education emerged in the debates of the first Legislative Assembly of Lower Canada as of 1791. It was part of a trend sweeping the Western World: Europe, its colonies, the Americas, and especially the United States following its recent independence. For the British Crown, establishing a public schooling project offered to all its subjects was seen as a way to support the education of the masses, by supporting the spread the liberal society's ideals, and to promote linguistic and religious assimilation. Nevertheless, a majority of the elected members of the Legislative Assembly of Lower Canada, along with the Catholic Church, raised serious objections to such a plan, confirming the rise of a national identity among the French-Canadians.

The British Conquest of 1763 reduced access to basic education due to the withdrawal of the Jesuits and the decline of the Récollets Brothers. This gradually left a majority of Catholic Francophones illiterate. It is estimated that 65 years after The Conquest, only 3% of French-Canadians could read and write. Out of the 150,000 school-age children in the 1820s, only 10,000 actually attended schools and not all of them on a regular basis (Graveline, 2007). The education of these numerous children was often handed over to private schools for the Protestants, while the Catholics counted on religious orders such as the Ursulines and the Congregation of Notre Dame for girls, the Sulpicians and the Quebec Seminary for boys. As a result, access to education followed religious, linguistic and socio-economic lines.

Since these private initiatives were in short supply, both the Colonial administration and the Legislative Assembly attended to the development of public elementary schooling for all children. The first attempt at creating public schools occurred between 1801 and 1824 when the Crown launched a project to build "royal schools" aimed at welcoming both Catholics and Protestants as well as lay people. However, French-Canadians saw these schools as a means of assimilation and boycotted them. Many schools closed their doors. Indeed, out of the more than 1000 schools that were built, only 22 remained open after 20 years, all English-speaking. One of them became McGill University after 1821. The following 20 years saw numerous attempts between the Colonial rulers and the Legislative Assembly to set up a schooling system which balanced the general objective of a public elementary education and the local support and expectations where linguistic, religious and class interests were divergent.

After several failed trials, a new law in 1845 established school boards in parishes, favouring the local concerns, hence reducing government ruling over education. Much to the satisfaction of religious authorities, schools were officially separated in two parallel systems so that control was handed over to either a Catholic or Protestant Committee. These were responsible for all decisions regarding school construction, pedagogical content, school materials, and teacher training. This structure allowed the elementary education system to be based on religion and community and was dependent upon local support for universal public education. Consequently, as of the second half of the nineteenth century, a network of schools in Quebec was established; the network was well developed in cities, but sparse in villages and the countryside. The Protestant and Catholic systems were divided, each handling its own finances and administration. This separation structured the coexistence of the two solitudes. It established colonial order through the education of the children.

Regarding the urban schools' architecture, both the Protestant and Catholic network, progressively adopted a construction plan organizing space with a corridor in the middle and classrooms on each side, on 2 to 4 floors. The exterior facade borrowed from monumental composition whose stylistic references – arts and crafts or neo-gothic for Protestants and beaux arts for Catholics – expressed the cultural and political allegiances of each community.

In the country, the rural schoolhouse dominated, regardless of religion. The building type sheltered from 1 to 2 classrooms and the teacher's dwelling. These modest buildings, comparable in scale to the farmers' home, were noticeable with their high windows and ornate doorways. They were built along country roads to improve access to all children on foot.

1943: Access to Elementary Education: Schools' building and design

By 1943, three forces triggered the transformation of Quebec's school buildings. First of all, after long debates opposing the Catholic Church and the provincial government, education became mandatory for children up to the age of 14. At the same time, confronted with unprecedented population growth, there was a tremendous increase in the number of children attending school; this situation sparked the biggest phase of school construction over the next 20 years (Figure 1) (Schola.ca, 2018). The baby boom was in full swing from 1945-1964. Indeed, Quebec's population went from 3 million to a little over 5 million inhabitants (Linteau et al., 1979). Together, these three events; a more active role for the provincial government, mandatory elementary education and the baby boom, affected the number of schools built, their shape, their area and their programme.

This period coincided with post-World War II economic expansion, which was synonymous with industrialization, growth and progress. The construction sector kept abreast of technical innovations in order to meet the increased demand. Also, aesthetically, the influence of the modernist movement was clearly noted (Algie et al., 2007). School building architecture began to explore new plans, the expression of the modernist movement in elevation and the integration of new construction techniques and industrial materials.

Finally, Quebec begins to tackle two serious issues: the inequality of resources from one school board to another and the dilapidation of many schools, especially the rural schoolhouse. The inquiry conducted in 1949 by the Department of Public Instruction revealed that out of 6245 schools, more than a third did not meet the legal requirements one way or another. Nevertheless, very few schools were renovated. The model of the centralized school was favoured and replaced many smaller rural schoolhouses with a much bigger one that covered the broader territory surrounding a village – the village school.

To ensure school access, the government decided to finance schoolbus transportation for pupils. Despite opposition from the clergy, which feared the separation of children from their family environment (Dassylva, 2013), the financial advantages of school centralization won out. Rural schoolhouses began closing their doors by the 1950s. Even though some were still built in a rural region, 400 rural schoolhouses closed every year until almost all had disappeared 10 years later in 1960. (Dorion, 1979).

Prototypes: The unexpected assortment

The prototypes' plans were drawn with the context of rapid construction, the desire to increase access to education and the persistent control of the clergy in mind. The Government initiative was a determining factor in the rapid construction of schools as one can correlate the years of publication and republication of prototype plans to the increase in school building construction: 1951,1954,1957 (Figure 2).

During this period that stretched to 1964, until the creation of the Ministry of Education, it is estimated that half the elementary schools were built using the prototype plans: 102 out of 205 (Schola.ca, 2019). On a provincial scale, more than 1000 schools were built using prototype plans. However, considering the law that obliged new schools to be built based on the prototype plans, fewer than expected were built this way. This implies that half the schools were built without these pre-designed plans.

In fact, considering their location, schools using a prototype plan were built almost exclusively in rural Francophone areas (Figure 3). Urban and Anglophone areas - Montreal, Quebec and the Eastern Townships - which already had well established pedagogical structure and more substantial financial means, continued to rely on specific designs and plans rather than the prototypes. Indeed, many of these schools were easily recognizable by their facades with monumental composition. The prototypes were mainly designed for schools in rural areas, specifically the new village schools.

The initial design hypothesis assumed that the urgency to build would favour the proposal of a small number of prototypes, probably sorted by the number of classrooms: one for 2 classes with or without lodging, one with 4 classes with or without lodging and

so on. However, research at the Quebec National Archives of revealed more than 70 different prototype plans; an unexpected assortment (Figure 4). These plans contain various spatial organizations, even among plans with the same number of classrooms, different construction techniques and stylistic characteristics from the vernacular to the modern, as well as a wide range of programmes.

This situation derived mainly from the existence of the local administration. Indeed, despite the initiative from the Department of Public Instruction in making prototype plans available, the Catholic Committee alone managed the entire construction process of the new schools upon the request by every school board. This administrative structure generally tends to prioritize individual projects rather than a uniform model. Therefore, despite the imposition of certain prototypes, regional differences in architectural form still prevailed at that time.

Consequently, at first glance, it is impossible to discern any conformity among the school boards and the building plans selected. Nevertheless, by sorting the prototypes according to dates and typology, a certain logical categorization becomes possible and certain archetypes dominate throughout the varied and, apparently, disorganized samples.

At the beginning, the first published prototypes applied the prevailing archetype of that time: the rural schoolhouse. The fact that the most common architectural types were reproduced demonstrated a certain fear and cautiousness, to avoid an architectural revolution at the same time as mandatory elementary education was imposed. In fact, religious authorities and the population did not hesitate to strongly criticize customized plans that differed greatly from traditional design and values, especially regarding the exterior appearance (Dorion, 1979).

Gradually, the prototype sample reveals attempts to redesign new rural schoolhouses, especially with the addition of classrooms to match the growing demand. Certain plans confirm the influence of the modernist movement with flat roofs and curtain walls for the façade (Figure 5). As well, modern construction materials were integrated with the use of concrete and steel in certain prototypes. However, wood and brick remained the customary materials.

On the other hand, certain prototypes took up former typologies. One series of plans reworked a popular model, characterized by a monumental façade and a cross-shaped ground plan, typical of a Protestant English-speaking community school. It maintained the same spatial organization, but showed more modest stylistic characteristics when implemented in a Catholic French-speaking school.

Another model, with an "H" shape footprint, was inspired by the typology of certain convents built at the end of the 19th century or at the beginning of the 20th. Prototypes with a typology inherited from chapel-schools were also found. This peculiar architectural type was previously built in remote municipalities, where very little means signified that the same buildings were used both as a school and a chapel.

This unexpected assortment of architectural designs tampered with the political discourse pretending to implement a standardized elementary education across the province of Quebec. Indeed, it is clear that most of the building decision-making process remained a local responsibility.

Finally, a series of prototypes proposing a new typology ended up dominating Quebec's school building inventory. Village schools were extensively built across the rural regions, as of 1952. In the following decade, they replaced most of the previous types and brought about the extinction of the rural schoolhouse archetype that dominated the landscape in 1942. Even today, the archetype of the village school remains the most widespread building type among Quebec elementary schools.

This following section will examine the main archetypes of this period. We will begin with the rural schoolhouse, along with the attempts to adapt this archetype, and end with the village school archetype. We will also discuss the modifications that were made to buildings throughout the years in response to pedagogical, construction, stylistic and socio-political changes.

Prototypes of the Rural Schoolhouse

The rural schoolhouse was initially the prevailing building type implemented to support the democratization of elementary education. In fact, these early prototypes simply fostered the multiplication of the schoolhouse type in rural areas to increase access.

Nevertheless, certain adaptations may be noticed. For instance, the vestibule was reduced to a simple airlock to allow more space for a reception area that became an entrance hall and often a cloakroom. The bathrooms, originally outdoors, became part of the back of the building at first, and then moved closer to the front entrance. Also, the lodging remained on the first floor in a separate area with a private entrance. As a result, the schoolhouse enclosed two zones: one pedagogical and one residential, separated by the entrance hall.

Furthermore, classroom size was standardized and measured: 9.1m x 6.7m (30' x 22'). This permitted the one-room schoolhouse to easily maintain residential dimensions. Rows of windows situated 1.2m (4') above the floor restricted the view outside for students at their desk. They were placed along the longest wall so that right-handed students, whether naturally or by force, did not shade their sheet of paper while writing. These rows of windows were never built on the main façade.

These initial prototypes for new schoolhouses followed the same rules for fenestration and composition as the vernacular homes built in the Quebec countryside. However, over the years, under the influence of later prototypes, the plans were redrawn to intentionally integrate rows of windows on the main façade. This characteristic progressively became widespread among Quebec's elementary schools, thus providing a more modern appearance and creating a rapid and clear architectural distinction between rural homes and the schoolhouse. This formal language, which underlined the institutional status, played the same role as the cross did previously on the schoolhouse pinnacles.

Where there were 2 classrooms, they were joined together along one of their long sides while the other remained an exterior wall so that each classroom always had a long row of windows. In order to favour the use of the right hand, classroom furniture was then reversed (Figure 6).

Prototypes of the 2nd generation of Schoolhouses

In 1951, the Department of Public Instruction published new schoolhouse prototypes "that resemble, as closely as possible, the architecture of old rural Quebec homes and are better than previous schoolhouses" (Dassylva, 2013). This new archetype was particularly interesting because it did not adopt an existing typology contrary to previous schoolhouse prototypes, while trying to preserve some conventional features. Torn between tradition and evolving needs, this archetype was in many ways a compromise: a rural schoolhouse that was modernized and enlarged.

The first step removed the residential space from the main building, which now sheltered up to four teachers. Hence, a second building attached to the main building was erected to house the teachers. It was narrower and not as tall as the school, with dimensions typically used in housing. This addition had its own private entrance and a half-basement. The school itself was still only one floor high.

In the school, the reception area was enlarged as to become a recreation room, a first introduction in rural schoolhouses. Its layout remained simple, occupying the equivalent of a classroom in the plans. This new room maintained the same vocation as the former entrance hall; a reception area, a cloakroom, and the connection between the pedagogical and residential parts. A small corridor was added in order to access additional classrooms. As well, a second entrance was placed at the end of the corridor (Figure 7). By comparing the functional graph of the second generation to the first, one discovers the use of the same strategy, the only difference being the necessary addition of a corridor. However, by grouping the classrooms as one function, we obtain the exact same graph as for the 1st generation.

Contrary to almost all specialized serial buildings, the repeated cell, the classroom, was attached on its shorter wall in order to maintain a row of windows on the longest wall. This rule, which goes back to the first convent, was absolutely necessary before

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electrification and was maintained out of cultural habitus in most schools right up to the 1970s.

A couple of years later, the plans were redesigned to add a half basement entirely assigned to the recreation space. It adopted the same typological characteristics as the ones found in village schools, by then the prevailing archetype. Furthermore, the administration area was added next to the main entrance. The desire to conform to the characteristics of the new models was clear with these two notable changes made to the prototype plans (Figure 8). However, this typology was rarely built as the village school prototypes were clearly favoured.

Prototypes of Village Schools

The set of school plans prototypes published in 1952, which produced the village school prototype, rapidly became the symbol of educational development in rural areas. Built in large numbers between 1952 and 1964 (more or less 420 schools), these buildings were easily identifiable due to their familiarity with the two or three-storey houses. They still remain today the most widespread archetype.The typological organization of this archetype diverges from that of basic building typology. The built structures are deeper, measuring 15.5 m (51'), and adopt a corridor-based organization with classes on each side of the central corridor. The building width varies between 2 types: one 34 m (112') with 4 spans, and one 29.5 m (97') with 3 spans.

In the first school type, classrooms occupied 3 spans while vertical circulation and services were located in the fourth span, often narrower. In the second school type, circulation and services were located in the space of one classroom. In both cases, the structural and spatial layout coincided with the spans. Each of these types integrates an option for lodging in the attic space (Figure 9).In the half-basement, the recreation space extended into two spans. The other spans housed the vertical circulation and the services, while in the case of the 4 span type, it also included a seventh classroom, which provided one class for every year of elementary education.

In the earlier drawings, the recreation room occupied the full width of the building, but, in 1953, it only took up three quarters of it in order to include room for service spaces such as bathrooms, an office and a storage space. The two rows of columns in the middle of the recreation room, located to support the ground floor walls along the corridor, were finally removed thanks to the introduction of laminated wood beams with greater load-carrying capacity.These spatial and constructive transformations shaped the recreation room's latter characteristics, which lasted until its disappearance, at the beginning of the 1980s. These characteristics consisted of the lowering of the floor by a few steps in order to have a higher ceiling and included a stage. The room was used for recreational activities rather than as an entrance area. In fact, it was no longer connected to the classrooms and became a dead end rather than a transition space. Furthermore, Figure 10 shows that it was at the same degree of accessibility as the classrooms. Nevertheless, it still had a second entrance facing the schoolyard.

Gradually the main entrance shifted from the centre towards an off-centre location. The façade's composition still reflected a desire for symmetry and regularity (Figure 9). Regular spans followed translational symmetry. The façade gave the school building a certain monumentality, including a degree of prestige, while inspiring a feeling of stability without diverging too far from the inherited culture and traditions. The result eloquently illustrated the nature of the compromise between the desire for progress in the post-war period and the preservation of traditional values.
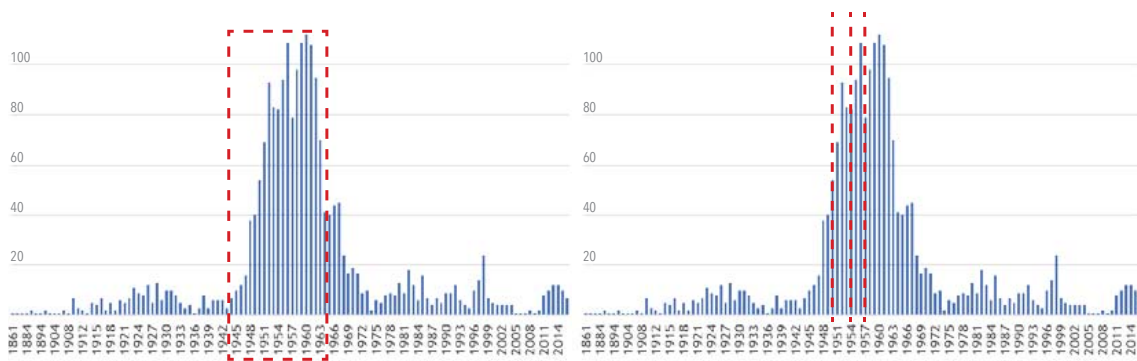
Figure 1. Number of schools constructed per year. In red, the critical period in question (1943-1964); **Figure 2.** Number of schools constructed per year. In red, the publication of prototype plans series
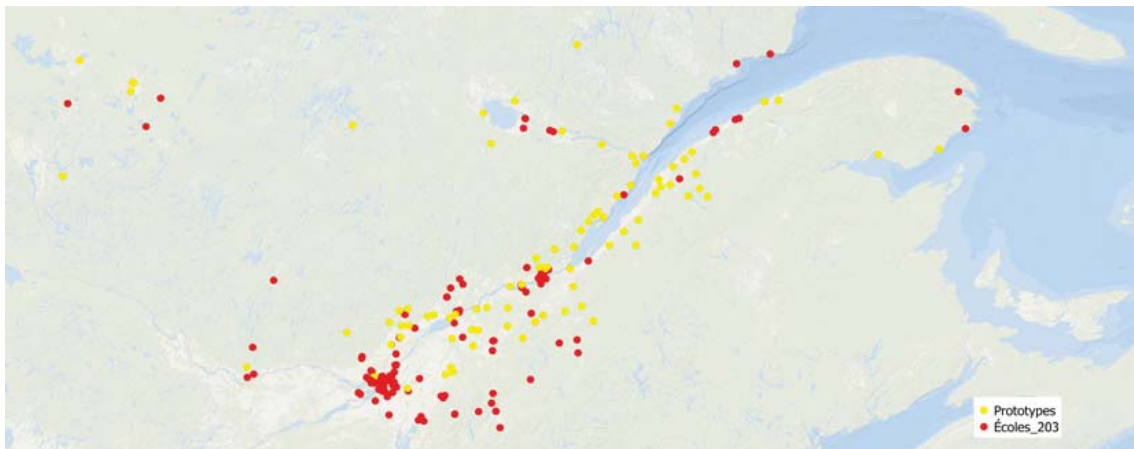

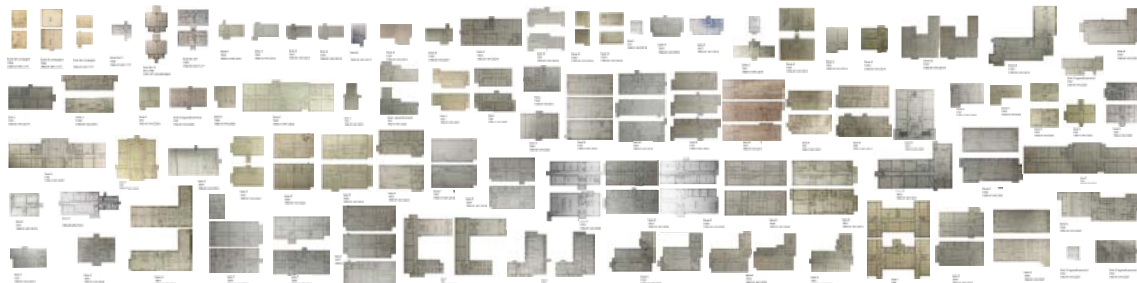**Figure 3.** Location of school prototypes (in yellow) and school projects (in red) built between 1943 and 1964.

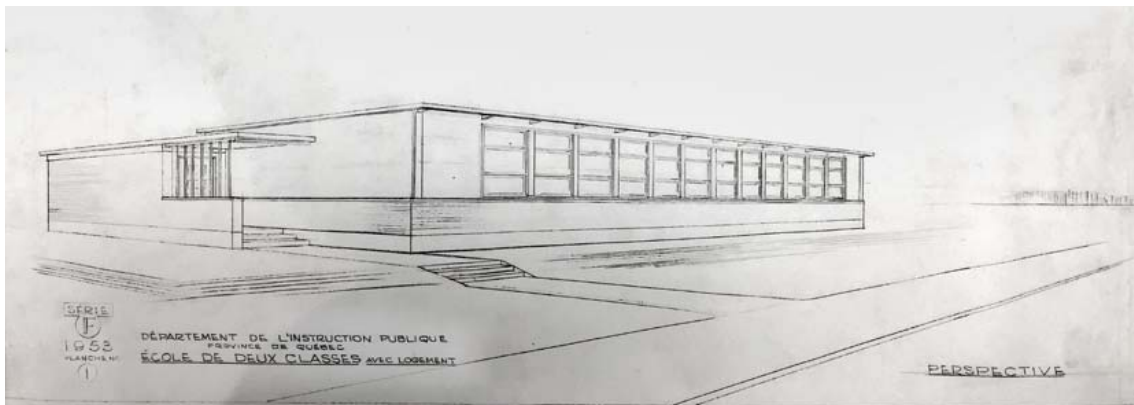**Figure 4.** Prototype plans found at the Quebec National Archives.

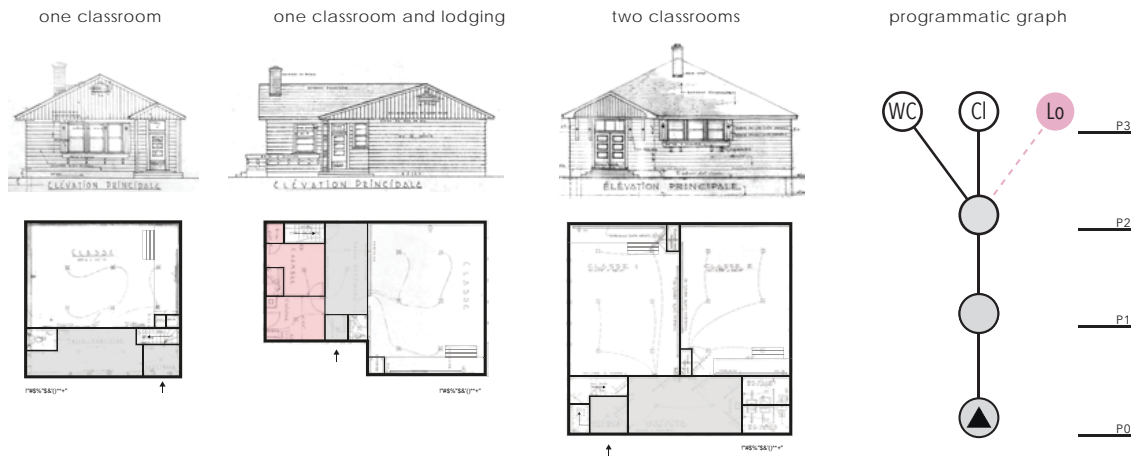**Figure 5.** Prototype of a modern looking two classroom schoolhouse, published in 1953.

Figure 6. Prototypes of the Rural Schoolhouses and their Graph of Programmatic Space Syntax.
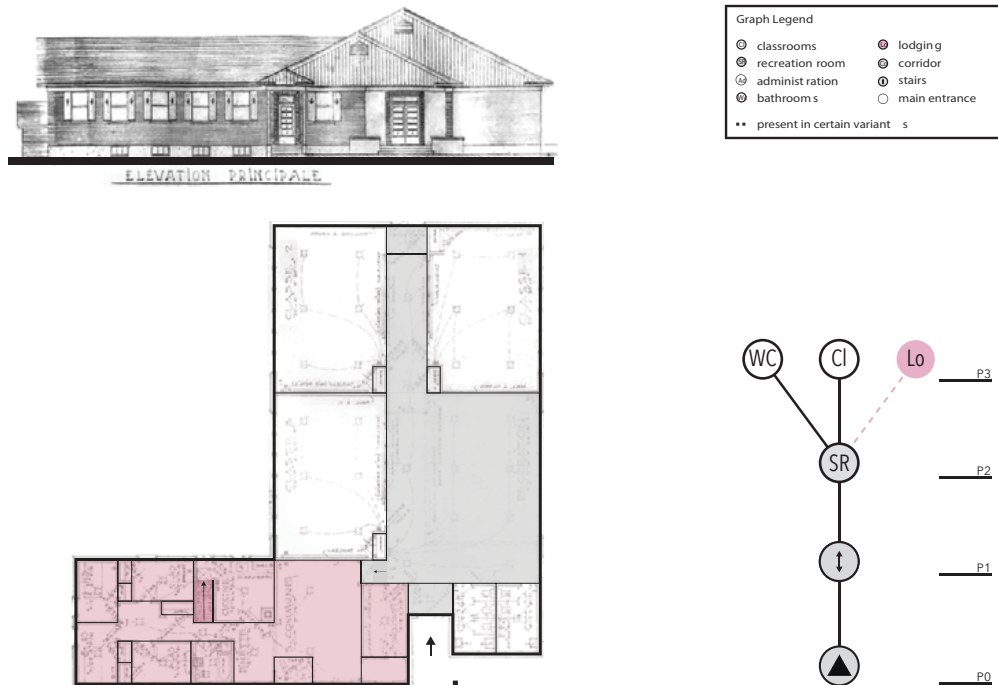
Graph Legend

- ⊙ classrooms
- ⊙ recreation room
- ⊙ administration
- ⊙ bathrooms
- ⊙ lodging
- ⊙ corridor
- ⊙ stairs
- ○ main entrance

•• present in certain variants

Figure 7. Prototypes of the 2nd generation of Schoolhouses and their Graph of Programmatic Space Syntax.

Figure 8. Prototypes of the 3nd generation of Schoolhouses and their Graph of Programmatic Space Syntax.
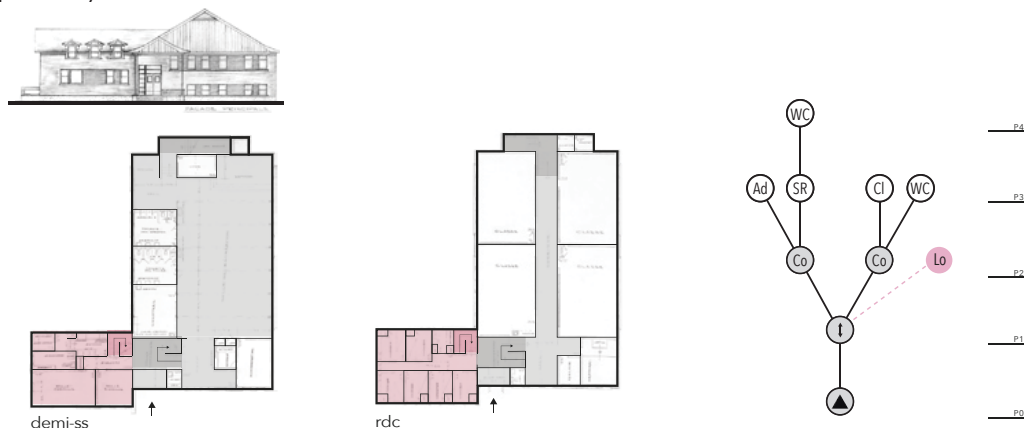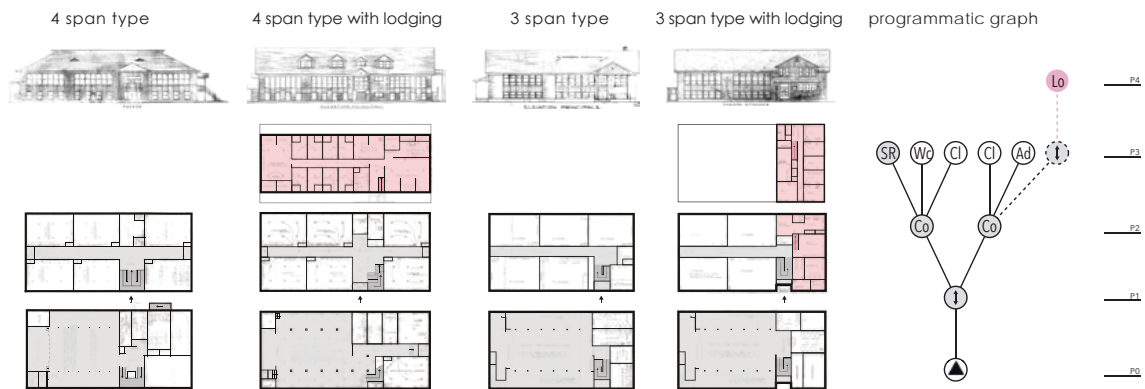
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Figure 9 Prototypes of Village schools and their Graph of Programmatic Space Syntax.

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Urban morphology education in Serbia: Origin, genesis and new tendencies

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Keywords: *urban morphology, education, Serbia, teaching urban morphology*

Abstract

   The origin of urban morphology education goes back to the beginning of the 1970s and a period of radical education reforms at the Faculty of Architecture in Belgrade, where urban environment became the main interdisciplinary topic. The importance of urban form has been since emphasized by planners, architects and politicians in various planning documents, symposiums and as such, became an essential segment of the architectural education. The subjects such as Contemporary architecture and form of the city, Urban environment and urbanization, Urban technic and composition and City environment were an important segment of the education for many years. This tradition was strengthened even more in newest accreditation, due to the individual contribution of academics who introduced new courses such as Urban Morphology and Urban Typology and Morphology. Having in mind recent contribution of researchers to emphasize the challenges of teaching urban morphology, this paper aims to enlighten the origin and genesis of the education of urban morphology at the Faculty of Architecture, University of Belgrade and to shed the light on new tendencies and means of teaching in present days. The paper will analyze syllabus of the courses, teaching methodology and present examples of student's projects on three different levels and courses: ex cathedra on the bachelor level, practical implementation of theoretical notions in studio design on master level and research-based work on the PhD level.

Introduction

The main objective of this paper is to describe the way urban morphology was, is and can be taught in an academic setting at Faculty of Architecture in Belgrade, while at the same time to position the urban morphology as a discipline within contemporary spatial development. Having in mind urban morphology's status as an interdisciplinary field of knowledge, this research explores ways to share, discuss and produce this knowledge within the disciplines of architecture and urbanism. This research will be structured in two parts. The first part will show the general history of architectural education in Serbia and later on the origins of teaching urban morphology within the Faculty of Architecture in Belgrade. At the same time, research will portray the broader academic context and role of urban morphology as a tool and knowledge with which to introduce future professionals that will intervene in space. In this part, historical development and transformation of academic courses regarding urban morphology are explained within the academic institution of the Faculty of Architecture in Belgrade.

The second part presents specific case studies regarding the processes of producing and sharing particular concepts, tools and methods of urban morphology in the academic curricula for students to better understand the logic and characteristics of built environment. In this part, a critical review would be provided of three courses: (1) *Urban Morphology*; (2) *Design Studio 06* and (3) *Research Seminar – Urbanism: Urban morphology and Typology* that were developed as courses on Faculty of Architecture in Belgrade. This paper will present issues regarding the innovative and creative ways of teaching and discussing the subject of urban morphology in university education on the level of Bachelor, Master Studies and PhD studies.

History of architectural education In Serbia

The Faculty of Architecture, University of Belgrade, is an educational institution with a long tradition associated with the practice of educating architects in Serbia that extends to the middle of the 19th century. With its various forms and types of organization, it has been established "as an attractive environment for development, promotion and dissemination of architectural knowledge" (Lazović & Mako, 2016, p. XVI). At this point, architectural education in Serbia has a tradition of more than 170 years, starting in 1846 with the foundation of "Indžinirska škola" by the decree of Prince Alexander Karadjordjevic, that among five subjects included Architecture in its curricula. Later on, the first Civil Engineering and Architecture course was established within the Department of Philosophy at the first Lyceum in Belgrade, which in 1863 grew into the Great School within which the Faculty of Engineering was founded. It is within this Faculty that the separated Department for Architecture was established in 1897. The transition of the Great school to the University occurred in 1905, with five University members including the Faculty of Engineering with its Architectural department. At the beginning of the 20th century architectural education in Serbia was under the influence of the first generation of architects educated in Serbia, as they started to work as teaching assistants and later on as professors at the school. During this period, Study Programme evolved according to principles of European schools of that time (Lazović & Mako, 2016, p. XVII). Previously, professors at the school were educated in Germany, Austria and France, thus incorporating the principles of those schools to the curriculum of Belgrade school. In 1931 the Architectural department gained its own building where the Faculty is situated today. In the period after the Second World War, the Department of Architecture at one time exceeded its organizational capacity due to a large number of students and the evolved curricula that led to the formation of independent Faculty within the University in 1948 (Lazović & Mako, 2016). Since that moment, several changes took place in the methodology of architectural education and organization of the school and structure of the curricula. The most important changes in Study Programme took place in the 1960s when Atelier system (design based curriculum) was established, and in 1970s when the concept of New School was introduced, including courses from social and humanistic fields along with the introduction of postgraduate courses. The New School, which was promoted in 1970,[1] was based on a trimester system, which promoted the "direct and continuous

relationship of students and teachers" (Anon., 1998, p. 16). What is specific for this period and the school is that the study themes and courses were based on the relationship between architecture and the environment, and the so-called environmental aspect was introduced in the school curricula. The studies lasted four years, of which the first two were of a general character, while the third and fourth had the choice between the two orientations. Duration of the studies changed over the time from 4 to 5 years, and today it consists of two levels that were introduced in 2006[2]: Undergraduate or Bachelor Level (3 years) and Graduate or Master Level (2 years) and most recently the programme of Integrated academic studies of Architecture (5 years) was also introduced along with several different Master level courses (2 years). Present-day Faculty of Architecture is "dynamic institution committed to the continual development of the architectural profession" (Lazović & Mako, 2016, p. 16) with the Study Programme "comprised of social sciences, humanities, technical and technological, artistic and philosophical aspects" (Lazović & Mako, 2016, p. 16).

History of teaching urban morphology

It is not entirely clear when exactly the first mention of the subject of urban morphology was officially introduced to the formal Study programme at the Faculty of Architecture. Over time, individual professors have made more significant or slighter changes in curricula that were in connection with the teaching of urbanism, urban design or urban planning in general. By researching the Book of courses from the beginning of the 1950s until nowadays it could be observed that there is constant change in the way the educational processes of architect were implemented. Although the global interest on the subject of urban morphology and urban form grew from the 1980s onwards, in the context of Faculty of Architecture in Belgrade, it could be traced to the beginning of the 1970s within the courses of Urban Environment and Urbanology that were part of Study Programme within the New School that started in the beginning of the 1970s. Urban Environment course was positioned in the first year of studies (1 trimester) and it had eight classes per week by professor Bogdan Bogdanović. As stated in the course curricula, the aim of course is to explore urban phenomena by "choosing one case (Case study), in order to examine complex natural and historical factors in the creation of the urban environment, and to examine the emergence and development of city morphology" (Anon., 1972). Bogdan Bogdanović also held the course of Urbanology that was positioned on all years of study, varying course curricula depending on the level of study. Also, Bogdanovic held a course Urbanology – Reconstruction and typology of urban structures that likewise was dealing in one part with the question and history of the city and urban form. Branislav Mirković and his course Technic of Urbanism and elements of Traffic were part of the syllabus in the second year. During the 1980s after the end of New School, courses evolved and changed their names, aims and methodology so at some point Urban environment and urbanization (prof. Borko Novaković) course was established on the first year of study, with aim to provide "simultaneous guidance of deductive and inductive ways of introducing into the most complex phenomena of urbanity should enable students to develop: (a) cognitive, (b) methodological and (c) self-educational process in the broadest field of architecture understood in terms of city building." (Anon., 1985, p. 11) Urban Technic (prof. Dimitrije Mladanović) was a course in the second year of studies during the 1980s, with goal to "acquaint the student with the basic technical and design-compositional elements most commonly used in urban design." (Anon., 1985, p. 13). Since 2006, Urban Environment and urbanization has changed its name to Built Environment (prof. Zoran Nikezić) and Urban Technic changed its name to Urban technic and Composition (prof. Dimitrije Mladenovic and prof. Petar Arsic) and later on became Urban Design of City (prof. Aleksandra Đukić and prof Dragana Bazik). Both courses were held in the first year. Along with these courses since the 1980s professor Ranko Radović has been teaching a course regarding Contemporary architecture and urbanism, with an emphasis on the history of architecture and urban form.

Different approaches were undertaken during the years at the Faculty of Architecture in order to promote general understanding of urban morphology, but until 2014 the-

re was not a single course that was dealing with the specific questions of urban form and urban morphology. In that period, after the reform and accreditation of the School programme new courses were developed in order to deal with the relevance of urban morphology as a field of study, and the ways on how it can add value to the understanding of the way city is being shaped, and the reasons why one should care about urban morphology both on local and global context. In the following part of the paper three courses dealing with urban morphology as a concept, methodology and tool in dealing with spatial question will be examined – *Urban Morphology, Design Studio 06, and Research Seminar – Urbanism: Urban morphology and Typology.*

URBAN MORPHOLOGY COURSE
Position of the course in the Study Programme at the Faculty of Architecture
The Urban Morphology is the course in the first year of Undergraduate studies (US) and Integrated academic studies (IS) of Architecture. Course is established in 2014, and it is led by professor Vladan Djokić. The course belongs to the group of obligatory courses with 3 ECTS credits. Classes are organized in the amphitheatre for 250 US students and 60 IS students (310 students in total). Due to a large number of undergraduate students and the planned 3 hours of active teaching per week, classes are organized in the form of one hour ex-cathedra lectures and two hours of interactive teaching.

Structure and forms of teaching
Lectures are organized thematically into three parts following the basic structure of the course book *Urban morphology - City and town square* (Djokić, 2004). In the first part of the semester, students are introduced to the basic elements of urban morphology (on the example of city and city square). In the second part they are introduced to the methodology of morphological researches, while in the third part they are introduced to the (local context) conditions for the emergence and transformation of cities and squares in Serbia. Interactive teaching is performed after one class (45 minutes) of ex-cathedra lectures and it is organized into two parts.

The first part engages students to work as a team in presenting or showing examples of city squares from Serbia based on the textbook *Typology of the City Square in Serbia* (Djokić, 2009). Each student is given in advance one of the morphological characteristics of the city and public square that he should display as part of a joint presentation. After the presentations, the participants in the class (teacher and assistant) provide comments and suggestions and moderate the discussion. The discussion is the final part of the first phase of interactive teaching and it is focused on comparing the presented case studies and examples. This section of the teaching insists on comparing examples for two reasons - the first one is understanding the comparative method and the second reason is developing a comprehension culture and building the discussion on scientific facts.

The second part involves the individual work of the student in the form of a croquis drawing, that is, an Illustrated Glossary of Urban Morphology, based on which the student's activity in the lecture is noted and the basic understanding of the topic and critical concept explained in the lecture is tested. The illustrated glossary is a collection / compendium of croquis drawings (10 in total) that is designed to encourage students to follow lectures and to obtain the minimum required knowledge for the test (colloquium) based on such notes. A short croquis drawing task is in the form of a quick examination of an understanding of a term that is based on an illustration of a given term. The student response is in the form of a sketch, a freehand drawing because the drawing is a "letter" and a tool for thinking, understanding and remembering. The main objective of this assignment is to adopt new terminology in the field of urban morphology in a way that engages the visual-spatial intelligence or visual cognitive abilities required in the architectural profession - (especially: perception, attention, memory, visual and spatial processing).

These different teaching activities are interrelated and conditioned, so engaging teachers and associates to coordinate activities is as important as engaging students. In the first class, the professor teaches the course material according to thematic units, introducing new concepts with general meaning and specific meaning in the field of urban

morphology. The second class is reserved for the croquis drawing task. In this part, one term is introduced, which is presented and illustrated in the first class through a lecture. In the second class, two case studies of squares in Serbia are presented and based on the criteria of typological classification, the similarities and differences of squares are discussed and the topic from the previous ex-cathedral lecture is emphasized through this process. The graphical representation of the squares, the selection of information and the structure of verbal presentation are evaluated through this part of the class. According to a predefined schedule, activity dynamics are enabled. The lecture is followed by all the participants of the course in order to answer the final task, and four groups of 7 students (28 students per class) actively participate in the presentation, while all the students are invited to contribute to the discussion.

Realization of teaching

Two teachers and one associate participate in the teaching process in that way that one teacher is lecturing ex-cathedra and the other teacher is moderating the interactive part of the class. The role of the associate is important because he / she attends the first part of the class and actively participates in the second part of the class. The role of teachers and associates in interactive teaching is to clarify and approximate the course material through comments, and to point out the application of acquired knowledge in architecture studies. The activities are aimed at understanding and adopting the terminology and graphic language of urban morphology. Developing interest in the phenomenon of the town square, and the specifics of that phenomenon in the local context. Linking the morphological characteristics of the square and the city, and finally reviewing the morphogenesis of the square and civic culture.

Required, additional and recommended literature

Required literature is in the field of urban morphology and includes two books by Professor Vladan Djokic, and additional literature is a textbook by Professor Zoran Nikezic. In addition to the literature in the Serbian language, students are also recommended books in English (such as *Urban Form, Town Spaces, The Image of the City, The City Shaped*). On the basis of the mandatory literature, theoretical knowledge is tested, and on the basis of additional literature students expand the terminology in the field of the built environment, while the recommended literature is offered as a basis for developing interest in researching the morphology of the city. In addition to the theoretical research of both typological and historico-geographical approaches, the book City and Town Square (Djokic, 2004) contains examples of cities and squares from the world (mainly the American and European continents) and in the book City Square in Serbia (Djokic 2009) extensive graphic material of typo morphological research. In the first book, the graphical appendices accompany the text and illustrate the text, and in the second book the graphic appendices are "text for themselves" - the language of presentation and analysis of urban form. Interactive teaching is based on developing the ability to "read" a second book whereby engaging teachers and associates is geared toward approaching drawing as a basic and significant cognition technique at all levels of architecture studies. During the interactive course, students receive short instructions on how to read the textbook.

As part of the course, guest lectures by eminent speakers from the field are organized (Ivor Samuels "Anglophone Urban Morphology – from explanation to prescription: UM as Dialogue between Cognitive and Normative in different contexts" in 2017 and What use is Urban Morphology ? in 2019 and for 2020, a lecture by Vitor Oliveira is planned). Guest lectures are open to all students and teachers of architecture, which is a kind of opportunity to broaden the interest in this field and to learn about the specific approaches and methodologies presented by the lecturers.

URBAN MORPHOLOGY COURSE

A Design Studio course, which is positioned in the 5th year of Integrated studies, is always site-specific and contextually based. Within studio, urban morphology, both as a

theoretical framework and practical tool is used, for site-specific design and context-sensitive researches. Within the Design studio, the teaching process is organized in that way that it is intensely devoted to foster individual approaches of students and culture of communication, both verbal and visual. In this process, teaching methodology is oriented towards developing technics of communication in order to present ideas and contemporary designs to the professional and general public.

The course consists of three independent parts – Seminar, Workshop and Design Studio. Each mentor within the course can organize it according to his own methods. According to this, for ten years within the of the leading author of the paper, a specific methodological approach was developed.

The course is structures as follows:

The seminar is run through the semester parallel with Workshop and Design Studio. The workshop is always organized at the beginning of the semester as a week-long study trip (site visit, contact with the local community, field work etc…) and at the end of the semester in the form of the exhibition on the site. Workshop results are used as inputs for the Design Studio, deciding the theme, programme and character of the future spatial interventions. The main result of Seminar is the verbalization of student's individual ideas and research tactics that they developed on Design Studio. Design Studio is emphasizing the role of the research. In this process divergent thinking in order to generate various individual themes and spatial interventions is promoted. At the same time, critical thinking is fostered as a way of self-evaluation at the end and during the design process. During the Workshop, Seminar is organized in the form of presentations and guided tours by local experts.

During the course, individual results are produced for each part of it (Design Studio, Seminar and Workshop) and are evaluated in the form of exam. After the completion of the formal part of the semester, exhibition and publication of student semester works are produced, as a selection of results from Seminar, Workshop and Design Studio and as and outcome of coordinated activities and team work. Publication content consists of illustrations of design work adapted to the book layout, themes derived from the workshop and written explanation of the research. Parallel to this, the exhibition is conceived in the process of adapting the design to the agreed poster format, along with using inspiration from seminar work and exhibition techniques verified during the workshop. Each student receives an individual grade, which in addition to evaluating individual stages of work, is also based on assessing progress in developing a personal research sensibility that was recognized at the beginning of the semester.

The evaluation criteria are based on the consistency of the research and the project. There are four intersecting points in the evaluation process. The first one is the evaluation of the workshop, which is organized during the 1st week of the semester. At this stage, the decision regarding the topic, character and programme of the intervention are evaluated. The second point of intersection is the First Colloquium, organized in the 7th week of teaching when the students present the concept design (in the scale of 1:1000). Here, the correlation of the proposed concept and research or topic is evaluated. After the colloquium, students complete their design focused on the requirements of the site. The third point is the Second Colloquium when the students present design project (in the scale of 1:500), and it is organized in 13th week of teaching. In the period from the second Colloquium to the exam term, students work on presentation and elaboration of the project in accordance with their individual topics.

RESEARCH SEMINAR – URBANISM: URBAN MORPHOLOGY AND TYPOLOGY

This Seminar objectives are focus to introduction to the research problem leading to the PhD thesis - the improvement of scientific competences and academic skills, alignment of the topic with contemporary directions of development of the discipline in the world, promotion of the multidisciplinary approach to contemporary topics dealing with the phenomena of morphology and typology of urban spaces.

Regarding the learning outcomes seminar allows students to acquire the neces-

sary critical knowledge and intellectual competences with which they will be able to independently solve theoretical problems in their area. Using the latest knowledge on morphological characteristics of urban space, students are introduced to the thematic research leading to the PhD thesis; they develop critical thinking and the ability to communicate at a professional level.

Classes at the seminar are focused on the understanding of the phenomena of morphology and typology of the city, as well as on a number of processes that accompany their development and transformation. Morphological characteristics of urban areas and their interdependence with functional characteristics, as well as their cultural context, are the subject of complex considerations, while students are enabled to identify and define their own interests in a given subject area. The overall phenomenon of the structure of a city is observed morphogenetically or within the historical continuity of its creation, development and change through time.

Independent research consists of the making of theoretical assumptions and their practical verification on a specific polygon. Theoretical assumptions are typological and morphological rules which establish principles and guidelines for urban planning and architectural compositional solution of a selected polygon. The selected polygon is a spatially functional unit which has the characteristics of unity and which includes different morphological and typological elements of built structures and open spaces.

Conclusion

During the previous six years, 6 generations of Bachelor students have completed the course of *Urban Morphology* (approximately 1700 people), two generations of Master students have completed the course *Design Studio 06u* (34 people), and six generations of PhD students have completed the *Research Seminar – Urbanism: Urban morphology and Typology* (18 people). Based on the results achieved, the techniques and content of the interactive teaching are reviewed annually. Experience so far has shown that small but constant changes in teaching process are necessary in order to interact with new generations and achieve the expected student activity. The personal interest and teamwork of the participants in the teaching so far has resulted in teaching aids: textbook, illustrated glossary and a practicum is planned this year to help the students to acquire and systematize the acquired knowledge in this subject / prepare the exam based on linking the content of lectures and interactive teaching.
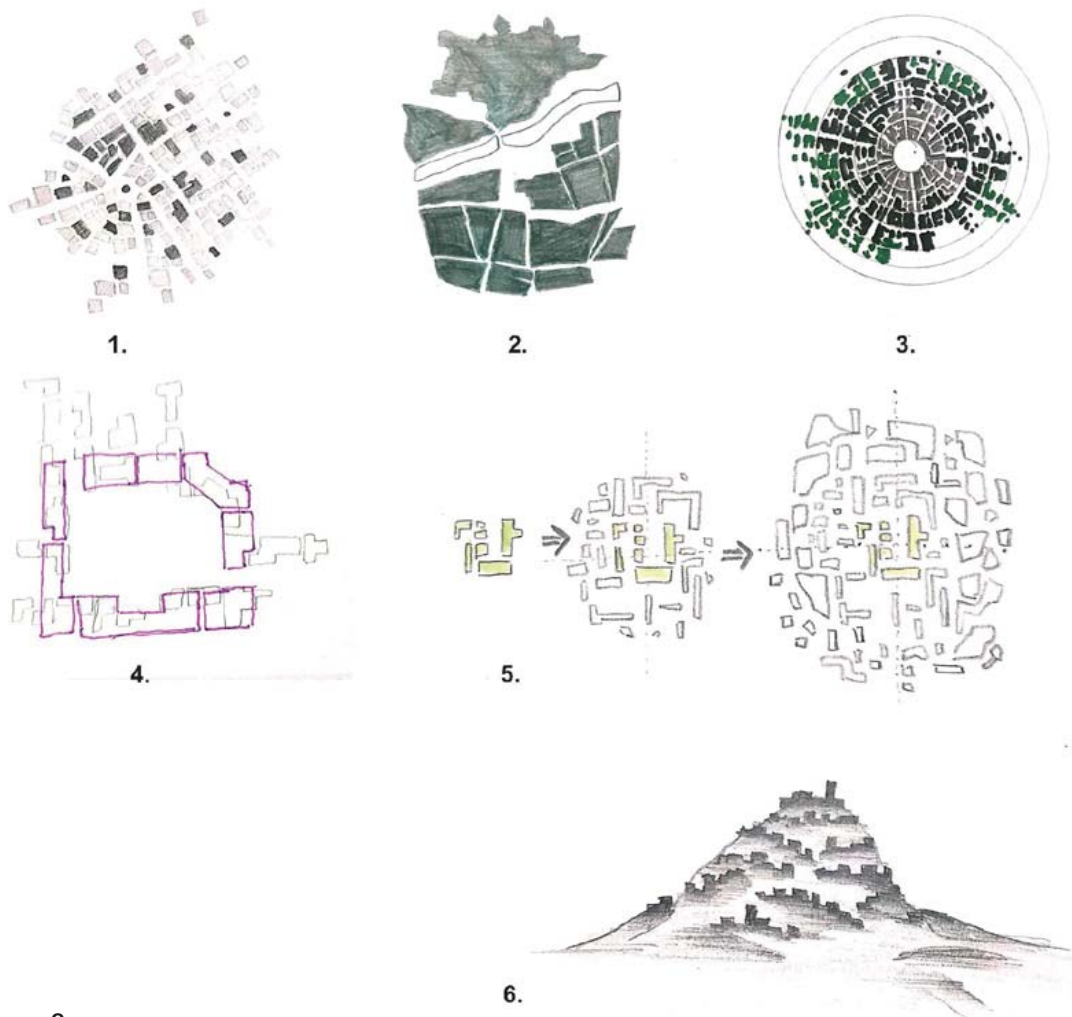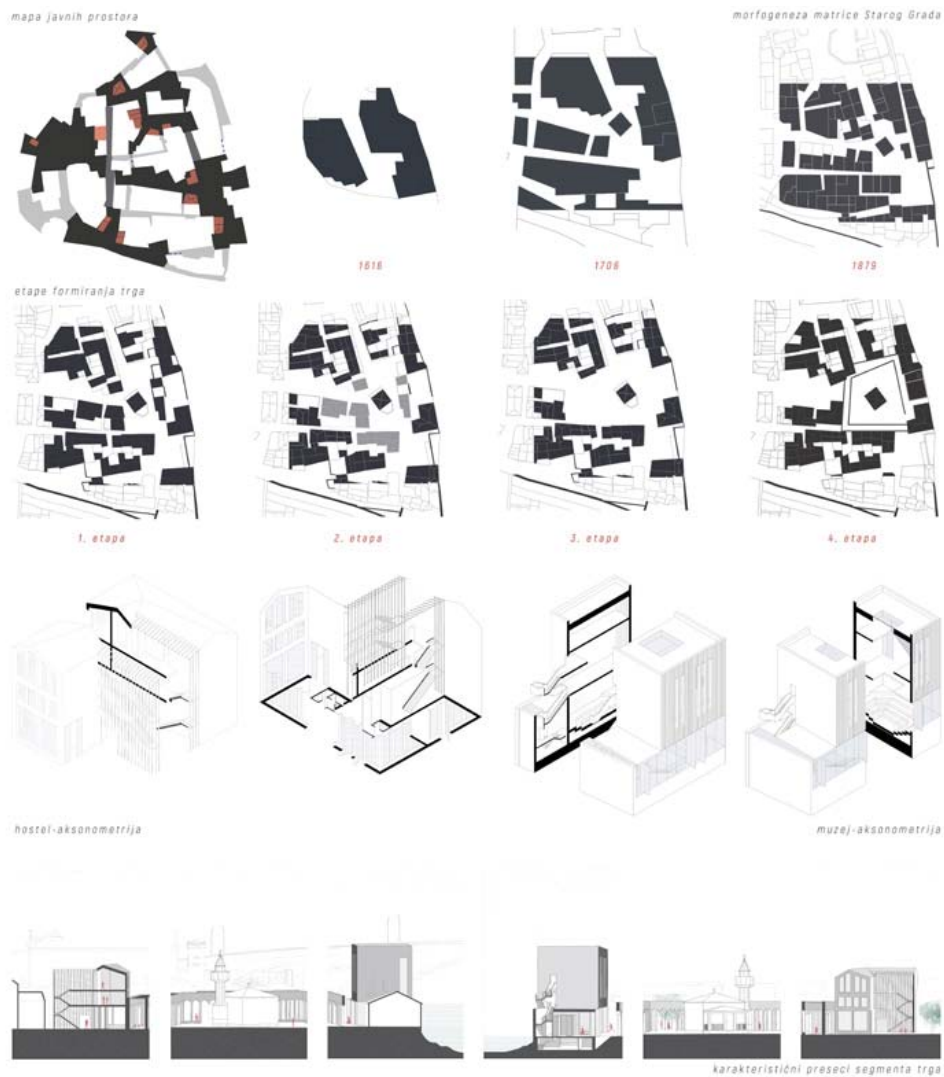
Figure 1.

1. 2. 3.

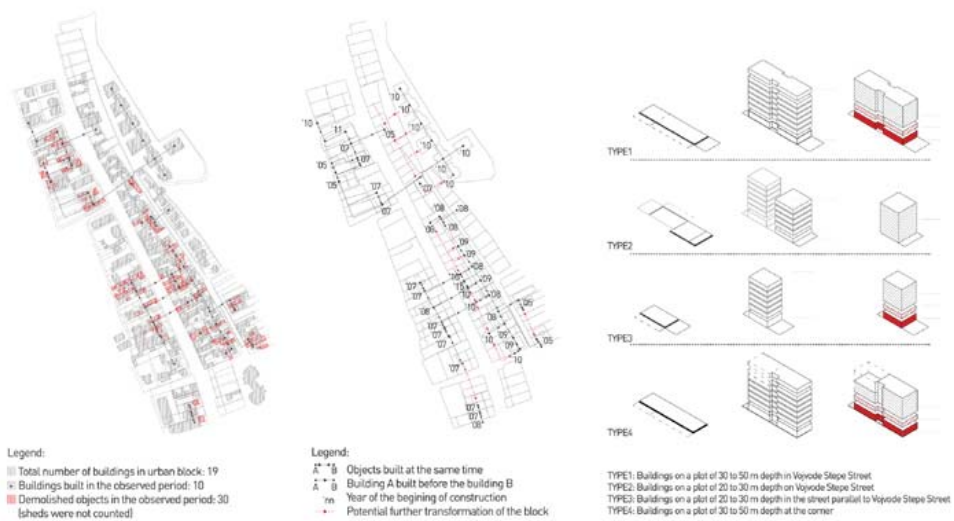4. 5. 6.

Figure 2.

Figure 3.

Figure 4.

Footnotes

[1]New School was active beetwen 1971 and 1974. For more information see (Фолић, 2017).

[2]In 2003 through international TEMPUS framework, many fundamental changes were introduces into the Faculty Study Porgramme within the project entitled "The Reform of the Study Programme of the Faculty of Architecture of the University of Belgrade. It is through this Programme that the integration of the Faculty of Architecture into the "European Area of Higher Education" as enabled. Programme has been operating since 2006. (Anon., 2006)

Caption

Fig.1 - Fig.2 - Illustrated Glossary (croquis drawings)

1. Urban structure, student: Tijana Žišić; 2. Urban structure, student: Teodora Simonović; 3. Monocentric morphogenic processes, student: Una Korica; 4. Morphogenesis - Moderate transformation, student: Ninoslav Markovic; 5. Monocentric morphogenic processes, student: Jovana Stefanović; 6. Privileged position of the city, student: Daliborka Dabić

Fig.3 - Selected work from Master course, student: Tamara Koneska

Fig.4 - Selected work from PhD course, student: Aleksandra Đorđević

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Morphological 'reading' as a Catalyst for Conservation:
Results from an urban conservation course in Penang, Malaysia

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Keywords: *urban conservation, shop house morphology, mid-career training*

Abstract

This paper focuses on the results of an urban conservation training course in Penang, Malaysia conducted four times since 2012, the product of a collaboration between the Getty Conservation Institute and Think City, an urban regeneration agency in the World Heritage city of Penang, Malaysia (inscribed in 2008). This short, intense course is for mid-career professionals (architects, urban planners, and urban designers) from the ASEAN network, ten countries in Southeast Asia. Although the course is not focused on urban morphology, an important component of the course centers on how to 'read' the historic fabric of a city such as Penang, which has several cultural overlays (South Indians, Chinese, Muslims from several contexts, Europeans in a post-UK colonial context, etc.). The course uses an actual historic neighborhood to introduce participants to the challenges associated with 'reading' the neighborhood from a morphological and historical evolutionary perspective. This entails understanding the ways that the traditional Southeast Asian 'shop house' has evolved since its introduction into the city during the late-19th century, and it implies the need for 'reading' the place with micro-level sensitivity. This exercise provides an anchoring experience for participants, who not only recognize forms and typologies from their home countries, but who also are required – in the context of the course – to use this conceptual anchor as a basis for understanding 'significance' and how to plan for the retention of that significance as the city evolves. Other lessons from the course are: (1) the need to understand architectural typologies within contemporary contexts of rapid change; (2) the importance of engaging with local communities in determining how and where change should occur; and (3) the importance of understanding and applying a well-recognized conservation methodology so that significant historic fabric can be properly retained for the future.

Introduction and Objective #1

This paper seeks to accomplish two inter-related objectives. First, it addresses a key question related to urban conservation practice: how does historic context relate to the significance of the place? To provide one answer to this crucial question – 'crucial' because of the pivotal role that questions of significance figure in contemporary urban conservation situations – I will use a series of recent experiences from the historic city of George Town, Penang (Malaysia), created in the late-18th century by the British in the context of colonial expansion in the Southeast Asia region; George Town was jointly inscribed (with Melaka) on the World Heritage List in 2008. These experiences stem from four urban conservation training courses I have helped create and then directed, as a Senior Project Specialist in the Buildings & Sites Department of the Getty Conservation Institute in Los Angeles, along with staff from Think City, an urban regeneration organization in Malaysia. In what follows, I will explain the important role played by the physical and non-physical attributes of historic architecture – in Penang, as elsewhere – especially as these attributes relate to the creation of a statement of significance for a historic place. I will further explain how this statement relates to an overriding conservation-focused methodology which, in turn, helps in the eventual conservation of the historic place. Thus, in relation to this paper's title, the 'reading' of the context – historically, architecturally, semiotically – ultimately becomes an important catalyst for the eventual conservation of the site.

Objective #2

The paper's second objective is to reflect upon how a Muratori-esque typo-morphological approach – which usually, but not exclusively, has been applied in European contexts – might be useful in its application to the George Town case and, by implication, to other places in East Asia. The deep respect that the mid-20th century Italian architectural educator Saverio Muratori demonstrated for a full, rich, penetrating understanding of a site's context – along with its architectural genesis and evolution – provides an inspiration for better understanding the context one confronts in many historic urban landscapes worldwide. By unlocking and analyzing more carefully the variegated meanings related to any one building, site, setting, neighborhood or place, a better case can be made for its significance. One salient reason why Muratori's focus on the evolution of classical Roman, domestic house types has such relevance to understanding an urban manifestation with very different architectural 'genomes' is because of a proto-typical, partially domestic structure that is often called the Asian "shophouse". Recent scholarship has shown that this "quintessential urban vernacular form evolves as a type in [its] techniques and function, on the one hand, and the investment of meaning and cultural values in its form, on the other [hand]." From Japan and China to India and other regions of South Asia – with many tributaries branching off this trade-related arc – the shophouse spawned innumerable variations on the theme of a dually-functioning urban type: (1) a retail shop facing a commercial street, over and behind which was (2) a series of domestic spaces, some very private and others semi-public.

Muratori's methodology applied to the shophouse

One can see how these Asian types resonate with the kinds of analyses that Muratori and his followers conducted, using Roman domus prototypes. As one scholar has noted, "Through the diachronic and synchronic analysis of building types, the [Italian morphological] school attempted to explain the structural continuity of traditional cities and further provided a non-arbitrary, powerful, and convincing reference for planning and design projects of historic centers and areas. In general, the typology-led planning technique regards building types as the engine driving the interventions of historic centers. It follows specific typological rules to intervene and manage historic urban fabrics by single bits, which means treating individual buildings and their aggregated urban forms as a unit of intervention." The "single bits" alluded to here, when applied to Asian historic cities, are often shophouses. In some recent cases, scholars have suggested how the Italian typology and morphology-led techniques might provide a useful conceptual framework for

contemporary planning in some Chinese cities.

However, "another modality, the morphology-led planning technique, is more concerned with the complex aggregates and individual constituent materials. Through analyzing morphological features that shape urban sequences, groups of buildings, and portions of urban fabrics, this technique aims to identify morphological units or, more precisely, recognizable parts of urban landscape. It also cares about the materials and elements of buildings and open spaces (e.g., fences, windows, doors, plaster coatings, etc.), since they compose the morphological vocabulary and create the image of historic areas. The first significant application of this technique was the planning for Assisi during 1955 to 1958, which provided a comprehensive survey and description of morphological and social–economic features of the historic center for the first time, and included the care of common buildings and surrounding urban landscape, not solely monuments."

Astengo's Assisi work, largely ignored

The meticulous planning and inventory work of Giovanni Astengo in Assisi during the 1950s was not only impressive in its own right, but it also suggests a methodology – one where every structure and cadastral lot is scrutinized and assessed in terms of its contribution to a larger urban whole – that certainly has implications for all historic cities, Asia included. However, the stark reality is that all-too-few Asian cities – and their decision makers – have understood the importance of Astengo's work, or indeed of other Italian architects and planners of the early twentieth century, many of whom urged caution when 'modern' architects advocated for radical reconstruction in the wake of war. In addition to Muratori, Caniggia, and Astengo, these 'cautionary' architects included Gustavo Giovannoni in Rome(who preceded the three I just mentioned), Carlo Cesari in Ferrara, and Gianluigi Cervellati in Bologna, just to name a few.

George Town, Penang as a useful urban landscape for an urban conservation course

One Asian city that has implicitly adopted this parcel-by-parcel documentation approach is George Town, Penang, where, as a result of the rigorous World Heritage inscription process, organizations such as the Penang Heritage Trust – before inscription in 2008 – and George Town World Heritage Incorporated, or Think City – after inscription – have conducted careful physical and social surveys in order to understand more holistically why the city is so significant. Recalling these actions leads me back to the Getty-Think City urban conservation courses that I have been coordinating in their four similar, but distinctive iterations since 2012. I will briefly summarize those training courses before I return to the point of how a morphological reading of the city – for our course participants – helped them better understand social and architectural significance. The courses grew out of a formal collaboration in 2011 between Think City and the Getty Conservation Institute to deliver three training courses for mid-career Malaysian planners and architects, some of whom are regularly charged with either accepting or rejecting development proposals, based on plot ratios and other planning criteria. The first two courses were held in George Town, in 2012 and 2013, and a third course was delivered in Kuala Lumpur in 2015. Although these courses focused on Malaysian cities, and most participants were selected from Malaysia, course content could be adapted to the needs and uses of other countries in the region; Hanoi, Phnom Penh, and Bangkok, for instance, all of which are experiencing threats to their historic urban fabric, and all of which still have many extant shophouses. The courses also related the values-based approach to the realities of contemporary planning practice, so that participants could connect methods they already used in architectural or planning practice to this new, conservation-focused approach.

As one of our instructors put it, "We pulled the course participants completely out of their comfort zone, since many of the ideas presented went against their formal training and work approach. Participants quickly recognized that they could not plan from on high and make decisions that will affect thousands of lives and properties without going down to the ground to try and understand how people use their space, what their heritage and social values are, and how it all connects. Or as we like to say, planners draw

spaces but people make places." Conventionally, many planners in Malaysia either approve or reject proposals—often by property developers—to transform (or "renew") older parts of cities into more "modern" areas with high-rise structures. Thus, they sit "on high" in front of their computers and match the development proposal with what the law permits in terms of height, footprint, and number of square meters. If the proposal complies with the law, they approve it, often without worrying about the implications of their decisions. Many of our course participants experienced an epiphany when they realized there was a sensible rationale for treating historic areas with greater care and sensitivity than what their standard urban planning courses had required. The courses, designed for urban planners and architects, stressed the importance of asking, "Why is this building or place important?" To answer that question, participants needed to link a place's significance to particular kinds of values—cultural, social, architectural, scientific, or others—as articulated by a wide range of stakeholders in the community. A better understanding of which values a place embodies helps us determine what makes it special. We can then think about how best to manage the site's significance by implementing particular policies, interventions, or monitoring steps." The key to taking necessary steps, therefore, was understanding the context of the place in order to clarify its significance.

Imparting a conservation methodology

The courses used the Australian Burra Charter (1979, with later amendments) as a basis for teaching a conservation-based methodology. By using this charter -- widely employed throughout Asia and elsewhere -- instructors helped participants understand (1) the challenges and practicalities associated with the documentation and recording of historic places, (2) how to understand significance and the writing of a Statement of Cultural Significance, (3) how to develop policy based on that significance, and (4) how to manage historic sites in accordance with those policies. During the courses, small neighborhoods within the World Heritage area were used as living "laboratories," or field sites, and participants were able to apply lessons learned from a PowerPoint lecture or discussion to an actual place. One example – and one course field exercise -- was related Kedah Road, once a village path through Malay, Jawi Peranakan, and Indian Muslim settlements in 19th-century George Town, where participants were asked to identify the values that helped make this now seemingly ordinary neighborhood so significant. We knew, since we had scoped out this location with the help of local course instructors, that several South Indian bakers were still operating their small businesses behind unmarked doors, that there was an important local temple within what looked like a shop house, and that there were several small religious shrines at the rear of some structures. But participants didn't know these things until they asked residents questions and examined the social, as well as physical intricacies of the place. In this way, participants were better able—as budding urban anthropologists—to specify what made Kedah Road so distinctive and important. During another field exercise, which focused on the early 19th century market town of Balik Pulau, participants drafted a statement of cultural significance and developed an abbreviated "special area plan" for the town. Saving the old, abandoned market was a key element of the proposed plans, as was the maintenance of rows of shop houses, which reflected the town's social and economic evolution.

Field site: shophouses as the predominant building type

In the most recent iteration of the course – in 2018 – we selected a small neighborhood on the periphery of the buffer zone of the World Heritage site, a popular enclave because of the food (especially "chendol") one can buy there from street vendors. However, food was not the primary criterion for selecting this site. Instead, it was because this small neighborhood exemplified many of the contemporary challenges to urban conservation seen throughout the ASEAN region: what kind of infill architecture might be inserted into empty space; how to retain authentic shophouses at a place where the urban morphology changes so dramatically; what kind of public spaces might be designed in the neighborhood; and how to cope – aesthetically, architecturally, and otherwise – with the proximity of a new light rail line, which is proposed immediately adjacent to the area.

Course participants were tasked with defining what made this small neighborhood so 'significant'; they (in small groups) needed to create a statement of cultural significance that would become the baseline document for ultimate rehabilitation/redesign of the site. In order to understand the morphology and evolution of the place, it proved to be exceedingly beneficial for participants to begin their understanding of the place by focusing on the shop house building type. As mentioned above, many were already intimately aware of this type in their home settings, so they could immediately 'read' the neighborhood's morphology, thanks to the prevalence of the shop houses. I should stress that their understanding of the physical evolution of the study site was aided by this knowledge, even though their understanding of the social evolution stemmed from interviews with local residents and other data that we supplied to them. The main point I emphasize is that the morphological reading of the site was greatly facilitated by using a Muratori-esque methodology, which was then supplemented by other 'readings' of the place, derived from other kinds of data.

Lessons and Conclusions

One of the key lessons we have learned from conducting this course – and I should add that the course will occur again in November 2020 and sometime in 2022 – was the need to understand architectural typologies within contemporary contexts of rapid change. The rationale of the Getty has been that there is an enormous need for much better-trained practitioners in the ASEAN (and Asian) region who have an ability to make solid, well-founded judgments about urban change. This need is made even more intense by the impending, likely but largely unknown changes from the climate crisis. If these practitioners do not have the sensitivity to undersand – deeply and in a Muratori-esque fashion – the physical context in which they are working, then their tasks are even more formidable. A second lesson, and one perhaps not as germane to a Muratori methodology, is the importance of engaging with local communities in determining how and where change should occur. This kind of outreach, which the participants inherently seem to embrace, is fundamental to sustainable solutions in urban conservation. Thus, a portion of the course also stresses some of the ways such communication with local residents might happen. A third lesson, and the final one I underscore, is the importance of understanding and applying a well-recognized conservation methodology so that significant historic fabric can be properly retained for the future. The methodology we have found to be most useful in the Asian context is the one largely promoted by Australian practitioners, called the Burra Charter. By imparting this methodology to participants – and one should note that first step in the methodology, since that's were a morphological reading of the place is so crucial – ad hoc solutions are avoided. Instead, participants in the course learned that by crafting a statement of cultural significance, they were not simply engaged in a so-called academic exercise. Instead, they were creating a foundation upon which to create policies for conservation, which then could enhance the site. Therefore, Muratori's attention to contextual detail fits well within the scope of what we try to convey in this distant urban conservation course, "distant" in time (from Muratori), "distant" in place (from Italy), but fundamentally "near" to all of us who are concerned with the importance of urban form in both understanding and conserving historic cities.

Figure 1. Aerial view of central George Town, Penang Island, Malaysia, 2014. Photo by Author.
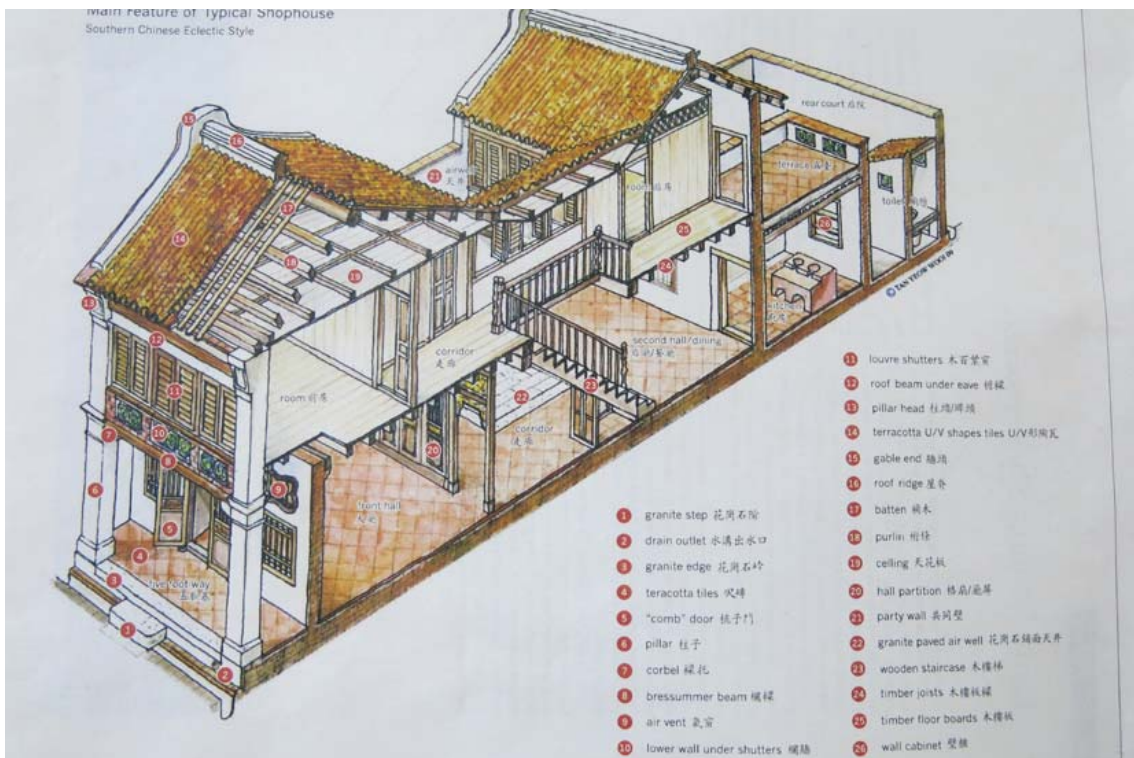

Figure 2. Main features of a typical, southern Chinese-derived shophouse in Penang. Drawing by Tan Yeow Wooi, 2009.

Figure 3. Street view of "Chendol Street", the study site for the Old Cities, New Challenges course, showing the prevalent building type of shophouses.
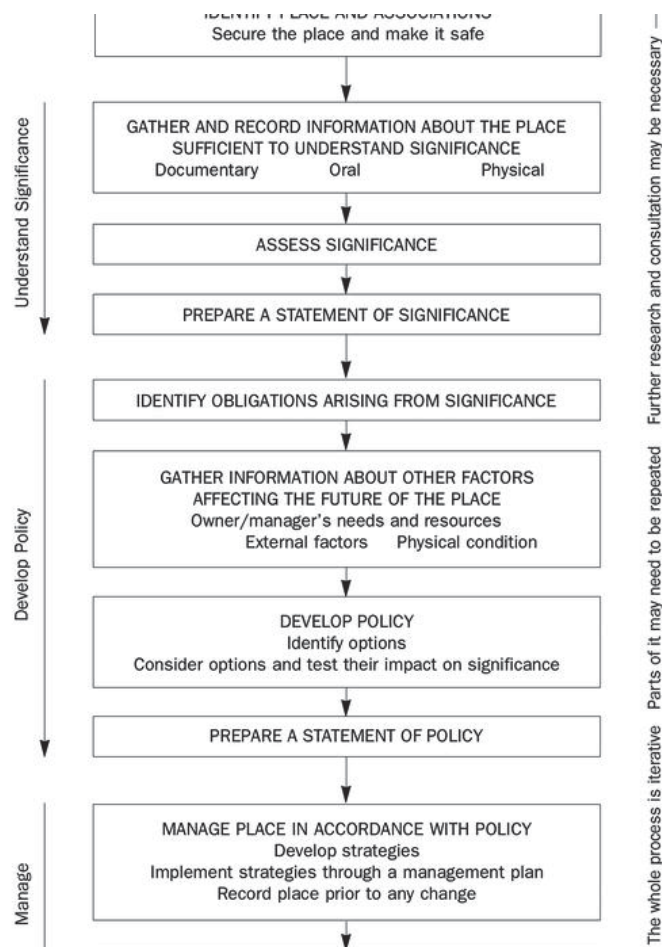

Figure 4. Conservation methodology derived from the Australian Burra Charter (1979, with later revisions).

Footnotes

https://www.getty.edu/conservation/our_projects/field_projects/urban/

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Cody and Siravo, Historic Cities: Issues in Urban Conservation.

For more on this approach, see Erica Avrami, Susan Macdonald, Randall Mason, and David Myers, eds., Values in Heritage Management: emerging approaches and research directions (Los Angeles: Getty Conservation Institute, 2019).

These kinds of plans are permitted under Malaysian laws. See, e.g., World Heritage Site Special Area Plan, George Town (2016).

Chendol, popular throughout Southeast Asia, is an iced sweet dessert that contains droplets of green rice flour jelly, coconut milk and palm sugar syrup.

Schools of Municipality I of Rome: reading of the derivation process from the special type: the palace and the convent

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Keywords: *Urban morphology, architectural design, urban design*

Abstract

This research presented is a part of a doctoral thesis that is not already concluded. The latter wants to making a reading of the training and transforming school buildings processes into consolidated fabrics.

Specifically this paper describes how the school building retains the typological characters of palaces and convents.

Indeed, the architects, who had the task of outlining the configuration of the schools, had to reformulate new theoretical and practical paradigms for these buildings. The design must synthesize, coherently and organically, the new urban role of the building, the relationship with the city and functional needs.

The searching for the school's shape leads the designers to analyze the matrix characters of the consolidated building types, that are permanent in the organic process made by continuous transformations and innovations.

In this complex process of definition of type, the references are convents and the palaces. The schools of the Municipality I of Rome are studied through the tools of urban morphology. They have some differences: one part of the schools analyzed is obtained in pre-existing special buildings in which it's possible recognize some typological interventions and adaptations, the other part collects the new buildings that is constructed on an empty area adopting the matrix of the type adapted and updated to the new complex of required functions.

The study of these organisms explains the typological process, arise from the need to intertwine some new elements to the original matrix, such as special spaces (auditorium, refectory, laboratory, gym ...).

Historical legacy as a design tool in the twentieth century

This research is a part of PhD thesis called "Rome. Municipality I: reading of the urban fabric and of the school buildings for the contemporary transformation and design" developed in DRACo doctoral school. The research is dedicated to the school buildings of the Municipality I of Rome intended as architectural organisms characterized by the continuous need to transform themselves, adapting to the different conditions and maintaining, however, the character of their structure.

Recently the issue about modernization of schools has been widely discussed. The international discussion was very heated and brought to new distributive and functional schemes, manuals and design guidelines. On the contrary, this research considers the school as an act of process, moment of logical transformation, and the design as invention, line guide that allows to identify a continuity thread.

I mean design as invention. This word has no meaning of originality and something new. It derives for the Latin term invenio which, meaning "to find" or "to meet", indicates the finding and discovery. In this sense, the project arises from the observation of something already given and permanent and becomes an act of progress.

The case studies of this research, show how, in the process of transformation and design of the contemporary city, both a dramatic innovation of the fabric both an equal continuity of the characteristics of architecture emerge. These special buildings, in their complexity, collect some process laws, notions that contain the dialectical relationship between enclosure and cover, serial and organic structures, cities and buildings.

In fact, at the end of the nineteenth century and the beginning of the twentieth century, institutional buildings, including schools, represented the government power and the upgrade of the European capital city. Architects was called to formulate some paradigms able to synthetize organically the urban role and the emerging functional needs of education.

The school required some series of rooms reserved for teaching and for administrative services, some rooms for special functions and a large interior space used both to distribute the interiors and both to mediate the relationship with the city1.

When the capital was moved to Rome and the historic city suddenly underwent the consequent transformation, there was an immediate propensity to reuse some special buildings, palaces and convents, organized through paths tangent to the internal open space. This is a process that follows what generated the Italian building as an organic solidarity of housing units. This fusion determines one space that is a spatial and distributive node, centre around which building's life unfolds.

Below, in the search of the new shape of schools, the designers were inspired by the matrix of the consolidated building types2.

The architects were in charge of outlining a new configuration of the school building. They had to reformulate some theoretical-operational paradigms capable to synthetize coherently the new relationships between portions of city determined by its growth (axes of restructuring of the consolidated fabric and expansion matrices), the renewed urban role of public buildings, the emerging functional needs of the instruction building.

The organization of these new buildings, although articulated according to new parameters, presented characteristics that are still found in tradition. They are not an original product of new distribution and structural logics. It is impossible interpreting the characters of the new buildings as the exclusive result of new requests and languages.

From these considerations, school buildings are studied, through the tools of the typological/processual approach of Muratori's urban morphology school an interpretations of specific typologies classifiable in "serial" and "nodal" specialist buildings.

The first one is the result of the serial repetition of rooms (more or less equal and hierarchized) organized by a distribution path often carried out around open spaces such as courtyards, cloisters, patios. The second one is characterized by a large central space, distributively served and dominating the other serial and collaborating rooms.

The reference, taken from common experience, is constituted by the building type of convent and palace. The study was conducted on about forty schools in the historic center of Rome. In this paper are presented only two case studies that highlight how the

nedded spaces of schools are adapted to the shape of the historical convent.

Specifically, two cases that derive from conventual typology are presented. The first school is realized in a pre-existed building in the historic center and the second one is a newly built school designed in the consolidated fabric.

Luigi Settembrini School

Consider the case of the "Luigi Settembrini" kindergarden and primary school on the block overlooking the Trevi fountain. The school was built where there was the Chierici Regolari Minori's convent which dates back to around 1670.

The school occupies the entire section of the block because, through the monumental portal on via del Lavatore, you enter a vestibule, the corridor and finally you reach the staircase located on Modelli street. In this way, the classrooms of the school are illuminated by the facade on the back and through to the two internal courtyards whose architectural beauty is evidenced by the quality of the interiors, decorated with pilasters, entablatures and frames.

This distribution system highlights the numerous transformations that the complex has undergone over time. In this part of the research, we see the adaptations that defined the building's current shape and how it responded to the integration of different functions.

The oldest part was probably made up of the oratory of the friars and a series of elementary cells carried out along the perimeter of the adjacent courtyard. In a second phase these rooms were organized through a path that starts from the presbytery area of the church. Probably the block had a completely different shape comparing to now. It is possible that it had a road centrally, a continuation of Scavolino street, where some perpendicular rooms were installed orthogonal. In a later phase, in the desire to expand the building, these rooms are merged with the complex. The dividing axis, previously coinciding with the path between the convent and the new structures, in this phase works as overturning and doubling axis of the plant. Similar to what happens in urban fabrics, it becomes the nodal axis of the entire new organism and is readable through the hierarchization of the monumentalized portal surmounted by three windows with frames on the street that leads to the Trevi fountain. With this addition, are merged the internal courtyard of the connected block and the corridor that retrace the old privatized road. In the final phase, due to the need to more easily reach the elevations, the staircase is built at the end of the corridor on Via dei Monelli. Thus the nodal axis corresponding to the oratory is maintained. Its centralizing role is strengthened over time even if it loses readability in the facade as a result of the increase along the path and the incorporation of the private houses.

The convent distribution system today serves the school in the same way. Furthermore, both in the convent and in the school, the functions occupy special positions along the routes. The gym and the refectory occupy the oratory room on the different floors. The main courtyard of the convent, adjacent to the corridor, maintains the recreational function capable of hosting small events. The teaching rooms, on the other hand, are arranged serially in the rooms previously used for the houses of the friars.

Alfredo Baccarini School

The second case study is the "Alfredo Baccarini" elementary school. The building is located on the block between Sforza street and Cavour street in the historic Monti neighbourhood. In Giambattista Nolli historical map the block was occupied entirely by Sant'Annunziata and the Augustinian's church and monastery. Following the construction of via Cavour, the complex underwent a partial demolition and a portion of it was destined for the Medici barracks. In 1926, the school building was built on the sediment in a part of the military complex, in the raised garden area of the ancient monastery.

In the original design, the school consisted of the gym and the classroom building. The latter is organized on paths carried out around the rectangular courtyard along which the classrooms are disposed perimeter. The distribution system is organized according to the hierarchy of internal routes and presents the stairs placed in a polar position with

respect to the main entrance route.

The typological analysis of the school allows us to highlight how the characters of the conventual type are transmitted to the new buildings. Consider the convent normally composed of a nodal special building, the church, and the adjacent part dedicated to the monks' dwelling which is consisting of the repetition of series of virtually interchangeable cells. The series of rooms that make up the convent is organized through a path that starts from the presbytery area of the church. Similarly, to what happens in the urban fabric, this path acts as the matrix3 of a subsequent building path4 on which the new series of modular cells is organized. The next path, a connecting route5, concludes the formation of the cloister and permanently identifies external access coinciding with the dividing line tangent to the church.

The "Baccarini" school is a very clear example of the processual derivation of educational buildings from cloistered plant. It reinterprets the cloister replaced by the central open and rectangular space.

On one side of the cloister the gym, similar to the nodal church, covers functions similar to those of the religious building (events, manifestations …). The double distributive building that define the court is used for classrooms and administrative offices.

During the execution of the works, one part of the plot was destined for the barracks and, although the building differs from the project, it preserves the principle that generated it.

These schools explain how many special buildings reinterpret the characteristics of traditional architecture. The design of the new schools provides for its continuous updating of the typologies' process.

In fact, the derivation of the school from the conventual types takes place through the reinterpretation of the court and the reuse of the monastery which transmits the characters to the new organism. Moved by the need to perform new functions and roles, the elements of the enclosure acquire specific characters capable of transforming, typologically, some simple and serial systems into complex and organic structures. This investigation is based on the belief that these potential changes constitute the substance of the contemporary project and suggest looking at the design as a means of continuing and innovating the inherited characteristics.

Figure 1. Typological analysis of Luigi Settembrini School;
Figure 2. Typological analysis of Alfredo Baccarini School.

Footnotes

[1] Gazzetta Ufficiale del Regno d'Italia n.282 del 30 novembre 1888, Monza, pp. 5540-5542.

[2] The building type expresses the concept of "house" historically stated. It implies building set of rules belonging to a specific place and time which synthetizes the previous experience of the same character assumed by the building operator as a guide before acting. In these tenns the buiding type identifies with a collectively shared project.

[3] Matrix route crossing through the territory to connect two poles in the most direct way.

[4] The building route are orthogonal to the matrix route when it is stated to devote to building activity the borders of the latter. The distance between a planned building route and the following one corresponds to back-to-back arrangement of the building lots.

[5] The connecting routes connect two successive planned building routes, usually orthogonal to each other, to facilitate the relations between different pertinent strips.

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Schools as Elements to Regenerate the Communities in the Contemporary Cities. Case Study: Kashan, Iran

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Abstract

It is apparent that all around the world schools are considered as functional elements of social, cultural and economic growth of the communities. Therefore, it could be an area of interest for architects and urban planners to design schools not only as separated and isolated buildings only for educational objectives but also as public centers with interactions with the urban space next to them. Consequently, they could play a significant role to rejuvenate the context of settlements by promoting academic, social and urban cohesion in this way.

This paper is going to address the issue of schools as integral elements to regenerate communities in the contemporary cities through the ages. We carried out this procedure in the historical city of Kashan in Iran. To achieve this goal, this research aims to study the morphology of Kashan first at urban level to recognize different phases overlapped each other, then in plot and block levels. In the following, it examines schools inside the urban fabric to investigate possible transformations in nodal areas of the urban space.

To carry out this task, field research and descriptive-analytical techniques were employed to develop the documents. The schools that were included as case studies in this research were analyzed through urban morphology tools. Moreover, block and plot types inside the urban contexts were studied to support better identification, understanding and description of this procedure.

Introduction

The 21st century has been known as the 'age of the city'. The concentration of human action is what makes urban communities such a significant space of chance and challenge. An admired vision of information based on urban improvement would argue for fair attention regarding economic, social, environmental and governance issues in order to accomplish comprehensive, prosperous cities (Yigitcanlar, 2014).

The difficulty in architectural and urban regeneration in the last decades, has led scholars to search inside the conservation of the historic city the strategy towards the problem of urban regeneration. Globalization poses to the city, and to whom takes care of the urban and architectural project, a new fundamental question about the need for more understanding of the process of urban transformation, in order to formulate compatible adjustments, especially to be in position to propose new architectural organisms renewed and enriched with spaces for relationships. The design tools adopted up to this moment have often proved insufficient to meet the demands of the contemporary city (Carlotti, 2014). Therefore, through the potentials of urban morphology instruments, new rules and methodological criteria in order to regenerate the city urban fabric will be extracted.

Public schools are significant components of public infrastructure within our countries. Schools influence neighborhoods, urban areas, and districts. We should be worried about the role of public schools framework—a social and physical foundation that is crucial for the strength of urban communities. The efficiency of urban areas depends, to some extent, on the nature of schools.

Similarly, the quality of schools relies upon the quality of urban areas. However, there is a significant detach among urban areas and schools that is obvious in local practice, investigate, professional degree programs, and most policy-making levels. Moreover, there is a problematic detach that should be overcome between the education system and the field of city planning (Vincent, 2006).

Schools should consider themselves to be a community resource, opening their facilities to neighborhood individuals, providing education to the community, or supporting families under pressure and connecting them to different organizations.

this article is planned for arranging specialists to help dismantle the disconnect and argues that public schools should be considerably more integrated into more extensive urban planning and policy making, especially their infrastructure and capital planning. It will be an opportunity to consider the relations between schools and community regeneration projects in a different way.

Definition of "Community"

Community is a social space in which people associate for individual and collective interests. Community is also a social process marked by interaction and deliberation among people who share purposes, interests, capacities and fallibilities. Relationships and community grow out of shared values (like caring, participation, mutual respect, equality, and inclusiveness) and experiences. Diverse members choose to engage in common effort. Feelings of trust, competence, independence, and interdependence are made clear and strengthened. Building, strengthening, and sustaining relationships is a purpose and a function of creating communities of learning (Graves, 2011).

The new vision for schools as community centers to regenerate the cities

Public schools are closely connected with communities. They operate as learning centers. They utilize inhabitants, and they associate neighbors with each other. As place-based foundations, they are a piece of an area's physical texture, affecting neighborhood housing markets and impacting the community's architectural character (Chung, 2005).

Important new exchanges over the nations are bringing up issues about the connection between public school quality and neighborhood improvement, making new approaches for public schools and, perceiving the capability of public schools as instruments in urban development and regeneration (Bingler, 1999; Chung, 2002; Baum, 2004; Vincent, 2006b).

These issues emerge when city authorities understand that poor-performing schools hamper city regeneration objectives, for example, attracting and holding middle-class families and when teachers perceive that concentration of urban suburban deprivation makes academic performance more difficult to boost (Baum, 2004; McKoy and Vincent,

2005; Vincent, 2006a). In spite of expanding proof of progress, for example, the movement of community schools (Dryfoos, 1994; Blank et al., 2003; Dryfoos et al., 2005) and the developing enthusiasm for linking schools and community improvement (Timpane and Reich, 1997; Stone et al., 1999; McGaughy, 2000; Chung, 2002), this distinction stays clear at various levels.

Michael Schubert believes that there are huge school improvement endeavors in progress in numerous cities, however these are rarely related to attempts in similar urban communities to rejuvenate neighborhoods. Schools are slowly being improved, yet there is no deliberate method to interface that improvement to positive changes that might be happening in the area.

Accordingly, The new vision for schools is to consider them to be the community's physical centers. All things considered, they exist in almost every community they are possessed and administered by people in general. They are tangible places through which the vast majority of people go in their lives. They have immense physical and human resources of incredible quality and variety. Schools should be seen as places that individuals of any age use day and night, year around for purposes decided by community advisory committees representing every one of the numerous segments of the schools' communities. They should be the energizing points to build a community. In cooperation with other city organizations and institutions, community building endeavors ought to be done. To summarize, the academic, social and recreational needs of the people in the communities should be met in schools (Edwards and Brown, 1996).

The target is to build a community where children, adolescents, instructors, parents and members of the community interactively collaborate with each other.

Characteristics of schools as community centers

Community centers are intended to support social gathering and give spaces to individuals to assemble and interact together in both scheduled and incidental ways. A center typically includes a facility or potentially space that takes into account nearby associations and local groups to offer a range of exercises, projects, resources and events that meet a community's social needs (Rossiter, 2007).

A center can be general in nature, like a neighborhood or multi-functional center, with an emphasis on community data, social communication, meeting space, child care and community improvement.

It also can incorporate public facilities, for example, a recreation center, library, school, medicinal services and additionally social help programs. Different design structures may include a commercial focal point like a market-place or transport center, or highlight an open urban gathering place, for example a plaza.

There are multiple definitions of a school as community center including:
• Schools as community centers are viewed as those educational establishments, which serve not only the school community (students and educators) but are open and in the administration of all individuals from the neighborhood.
• They are organizations that set up and build up their work dependent on the necessities of families, students and the community.
• They offer a wide range of services, after school hours for families, students and the community.
• Schools as community centers welcome instructors and parents together as they take part in shared decision-making.
• These centers guarantee social cohesion.
• They are based on the strengths of community (Graves, 2011).
• Schools to be the center of neighborhoods and communities demonstrate practical applications of how schools and community can work together to share their facilities (Persse, 2017).

Methodology

Urban morphology has grown primarily in Europe, where a wealth of historical maps, plans and other documents exist. In most Iranian urban communities such records are similarly rare. In any case, the historical backdrop of these cities over thousands of years is exemplified in their urban development phases.

There are rarely any archaeological reviews of Kashan. Yet the city's history is embedded in its urban fabric. Via cautious assessment of the current urban fabric, it is conceivable to follow the procedures that have formed the city, regardless of the

scarcity of documentary records_(Caniggia and Maffei, 2001; Conzen, 1981a). In accordance with a consolidated methodology, by analyzing small historical towns and their landscape it is possible to acknowledge the urban fabric's formation phases before considering their transformation project (Strappa, Leva and Dimatteo, 2003).

By considering the capacities of the urban morphology approach this study has been implemented through these methods:

1-Case study

The study implemented the case study approach, concentrating on schools in the historical context of Kashan in Iran. All the selected schools have been examined in both areas of urban and plot scales. Such case studies were chosen since they had been and continued to be dependent upon regeneration activities. The case studies were analyzed through urban morphology devices. It sought to examine:

- How the designers are able to use the potentials of inner and outer parts of the schools to regenerate the neighborhoods around them.
- The opportunities and challenges which these schools might face in the process of transforming to the community centers
- Another essential component of the investigation is the recognition of school building types

Being aware of these components within the urban texture clarifies the significant role school structures can play in nodal areas of the settlements to regenerate the context of cities.

2-Survey and site visit

To obtain current information about the present situation and condition of the case study areas, survey and site visit are needed.

Current information on the case study areas was gathered through school observation followed by debate within the local authorities and school principals. Furthermore, photographs, brochures and drawing maps have been acquired primarily in this phase.

3-Literature study

General comprehension of the issue and the case study areas was gained through the study of relevant and up-to-date literatures including past and current studies in this field.

4-Interview

Interviews were conducted with school principals and local authorities, supplemented by specific questions as suitable. They were recorded digitally, and subsequently transcribed in full or part, and interview notes were taken to be utilized in the research procedure.

The location, the hinterland and the urban morphology of Kashan

Leaving Tehran in a south / southwest direction, the road leads one through a region between the western outskirt of the central Iranian desert belt in the east and the Zagros Mountains running in a north-western — south-eastern direction in the west. These mountains ascend to nearly 4000 meters. The urban cities of Qum (ca. 160 km southwest of Tehran) and Kashan (ca. 260 km southwest of Tehran and ca. 220 km north of Isfahan) are situated between the alluvial fans of these mountains and the Dasht-I Kavir.

Proof on Kashan City's morphology before modern extension originates from a variety of sources. Over the past fifty years, physical improvement in Kashan's townscape has been restricted and most has come through modern suburbs. The old part within the walls has considerable qualities of an Islamic Persian city. It was a city which had evolved over hundreds of years.

Before the improvement of the new suburbs, the developed region was completely confined within the walls. It was compact and constructed corresponding to the axis of the alluvial fan on which it was standing. The town had an elegant oval shape at the time of the building of the present wall (most likely in the early nineteenth century).

From the air, Kashan looks like most old Islamic urban communities, gathered together with various cell-like structures and a maze of irregular streets between. This irregularity came from urban growth's spontaneous nature. The network of route ways evolved and formed without planning direction (Figure 1).

Modern expansion

During the present century, significant changes have occurred in the physical morphology of Kashan City . In a specific way, these mirror the patterns towards social gathering by class and income as opposed to race, family or religion, evident in Iranian society in general.

The reading of Kashan's formation phases was essential because of the absence of historical-archaeological information (which would have been useful in following the various periods of development of the city and of its building fabric over time)

We depended on the method of process typology and on the identification of some recognizable structures in the building fabric in order to retrace the various forms of Kashan through time. These forms were associated with the different historical phases of evolution and contraction of its urban structure by methods of logical and typological reasoning (Gaube, Neglia, Petruccioli, and Rafipoor, 2018).

Evaluation of some schools as case studies in the urban fabric of Kashan

In this research, the behavior of schools in the urban fabric of Kashan has been investigated to explore the possibility of urban regeneration policies. Through LISP Programming Language Software as an innovative methodology of urban morphology approach used in this research, the transformation of different urban layers of the city has been analyzed meticulously (Figure 2).

Accordingly, to analyze the morphology of Kashan and role of schools in a plot and block scales, different types of schools as samples of study in the research area (circles 1 and 2) have been studied (Figure 3).

Then, the plan types of various Elementary, Secondary and High Schools depicted (Figures 4, 5 and 6). This is a procedure that looks like helpful to transform schools into community centers. In this paper, four schools with summaries of architectural information are illustrated. They are located in the historical urban fabric of Kashan (Figures 7, 8, 9 and 10). Based on the theoretical research of this study, to change the role of these schools with just educational functions to multifunctional community centers for city regeneration policies the following approaches should be taken into consideration:

• Support to meet the recreational and fitness needs of a community (providing both indoor and outdoor facilities)
•Providing space for social programs and activities
•To offer health facilities like general health, mental and psychological care, speech pathology, occupational treatment and youth laborers)
•To provide open areas including playgrounds, parks, and gathering zones
•To offer space for the arts to act as a hub for visual and performing arts programs, theater and Music
• To consider special interest clubs such as cooking, languages and technology upgrading
•Volunteering, enterprise and professional programs
•Housing and accommodation advice for students
•Sport and wellness classes
•To be open to individuals of all ages
• Promote progressively dynamic parental participation in school activities. For example, the creation of a school parent resource center sends an incredible message that parents are welcome and encouraged to engage in their children's learning.
• Improve associations with nearby organizations that are beneficial to students and support the neighborhood economy
•Encourage cooperation by individuals of the community in various ways, including mentorships, apprenticeships, and other learning opportunities according to work and service
• Contain shared open spaces that are available throughout the year
•Places where innovative space configurations broaden school use, where learning happens after school, around evening time, and on weekends, and where school-to-school associations, joins with organizations, and higher education collaborations are encouraged and supported.

They need not be expensive, yet they should bring to the community a sense of beauty, attraction and permanence. They will serve as obvious signs of community pride by reflecting the honorable character of public architecture.

Conclusion

Schools are the most valuable resources in a community and they should develop as community resources.

Effective schools promote a sense of identity and coherence within a community. Like a modern form of the old town square, a school should act as a community center that promoting cooperation and the benefit of all to its inhabitants.

Even without a physical space, schools can turn into a center for the community.

Previously, many schools were designed as stand-alone educational facilities that limited community access rather than facilitated it.

Their auditoriums, sports complexes, food service facilities, libraries, media centers, computer labs, and other particular spaces were normally only limitedly accessible to the community. The educational facilities of tomorrow must be intended to be progressively open and serve various needs of the community (Bingler, Quinn, and Sullivan, 2003).

Ultimately, the issue of school infrastructure is characterized by two complementary realities: (1) the nature of schools impacts the development of cities and (2) how urban communities change and develop affect the quality of schools. The potential success of the territories, cities communities, and schools is therefore intertwined.

An obvious model for the future is providing buildings with space where the community is welcome and where collaboration among all the community members are normal. During a time when we are as often as possible concentrating on hindrances to learning, such schools have discovered pathways (Figure 11).

We have far to go in connecting the urban communities and schools disconnect, and the planning sector must better incorporate public schools inside its theories, research and practice.
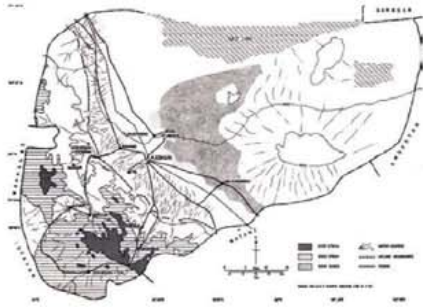
Figure 1. Kashan-Shahristan (Castello); **Figure 2.** Analysis of transformation of historical urban fabric.
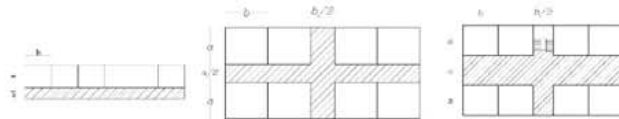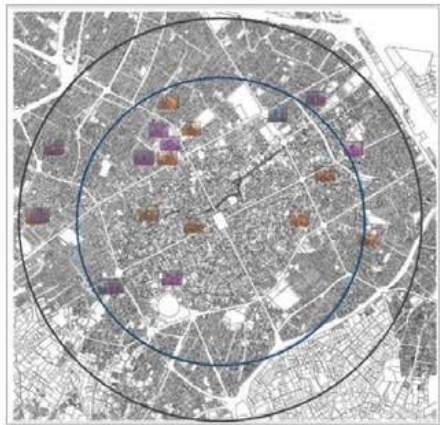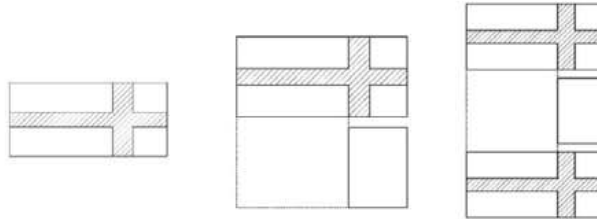

Figure 4. Different types of Elementary Schools

Figure 3. Location of schools; **Figure 4.** (top left) Different types of Elementary Schools; **Figure 5.** (down left) The core of Elementary, Secondary and High School types.
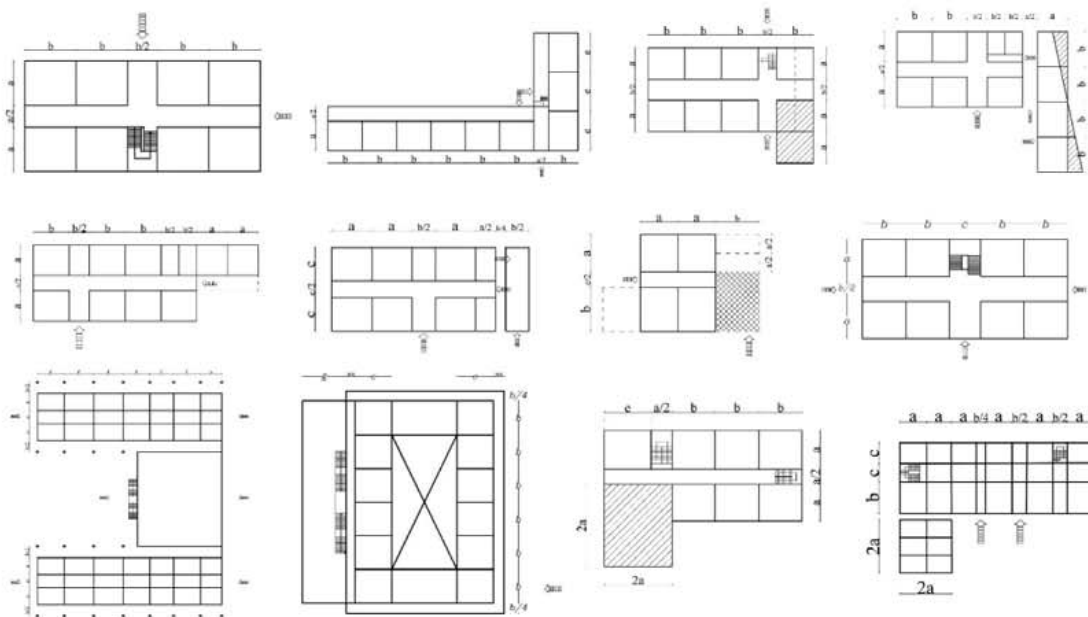

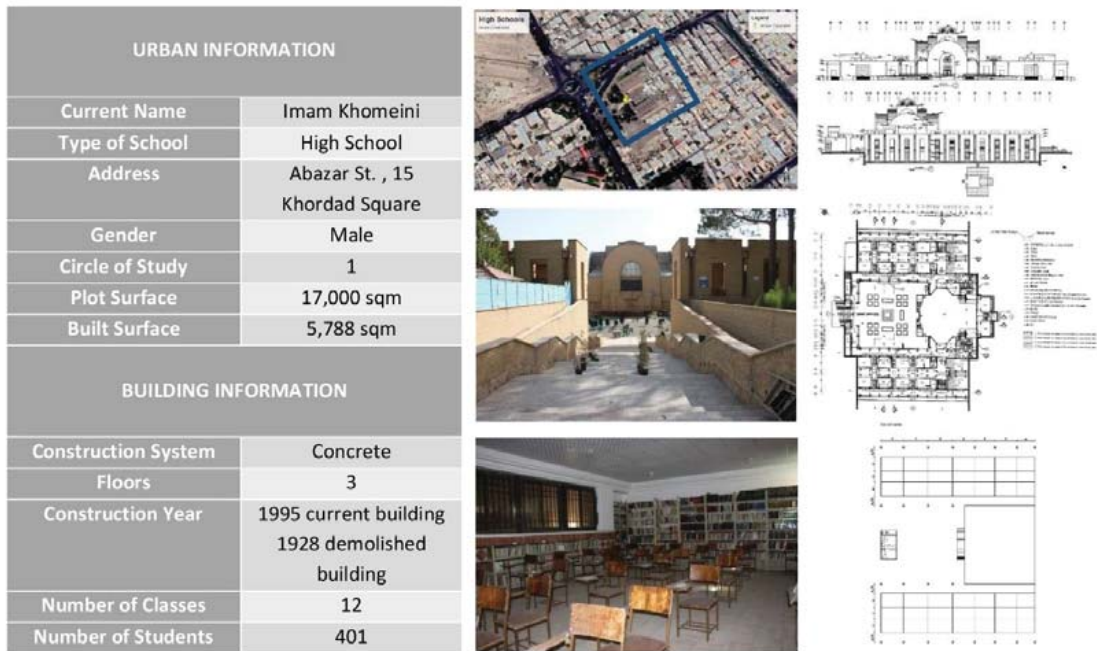**Figure 6.** Some Elementary, Secondary and High School types.

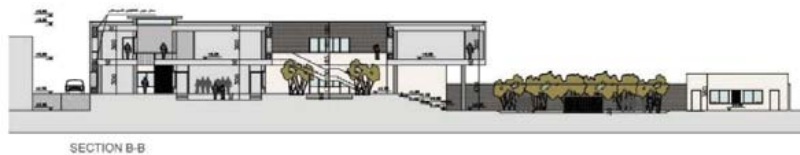**Figure 7.** Architectural information of Iman Khomeini High School.

Figure 8. Architectural information of Iman Khameini High School.

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Figure 9. Architectural information of Peyvandi Secondary School.

URBAN INFORMATION	
Current Name	Peyvandi
Type of School	Secondary
Address	Mazouchi 35 St. , Beheshti St. , Kamololmolk Sq.
Gender	Male
Circle of Study	1
Plot Surface	1794 sqm
Built Surface	1800 sqm
BUILDING INFORMATION	
Construction System	Concrete
Floors	2
Construction Year	2019
Number of Classes	9
Number of Students	306

Figure 10. Architectural information of Lajevardi Secondary School.

URBAN INFORMATION	
Current Name	Lajevardi
Type of School	Secondary
Address	Ghayoumi Alley, Kargar Blv.
Gender	Female
Circle of Study	2
Plot Surface	2399 sqm
Built Surface	3904 sqm
BUILDING INFORMATION	
Construction System	Concrete
Floors	2
Construction Year	2019
Number of Classes	9
Number of Students	297

School as a community hub - program of activities example

| Active participation	Safety	Health	Education	Belonging	Play and leisure
Student representative council (SRC) involved in planning	Cyber safety sessions	Visiting health professionals	Supported playgroups	Dad and son in the shed days	Sporting clubs
Parent-led events	Child protection training	Local CAFHS (Child Adolescent Family Health Service)	Homework Club	Interest groups eg photography, using an iPad	Kite making & flying
Children arranging presentations at staff meetings	Police visits & workshops	Docs on campus	Community Mentoring	Women's special interest groups	Board game groups eg chess
Yarning circles	White ribbon day & events	First aid classes	Youth workers at school	Grandparent days	Playgroups
Hub reps on local council sub committees	Road safety workshops	Breakfast cubs	External agencies running programs	Community garden	Movie nights
Aboriginal groups leading cultural awareness sessions	Looking after yourself groups	Keeping fit, yoga, pilates, Zumba, dance classes	Computing classes eg robotics, coding	Cultural days & celebrations	Art/craft courses
Parents & friends groups	Links with local service clubs	Healthy cooking/ eating classes	Parenting programs	Coffee and chat mornings	Dance groups
Leadership courses	CFS information sessions	Body awareness workshops	English classes for new arrivals	Shared lunches at school	Photography classes
Multicultural leaders invited to meetings	Shine sessions	Walking groups	Reading or Maths workshops for parents	Other languages courses	Men's shed/ men's groups
Families designing hub flyers	Anti-bullying presentations and workshops	Mental health info sessions	Children's Book Week celebrations	Harmony Day	Cultural festivals
Children surveying community members	Neighbourhood watch group meetings	Nurse at school for health care	Work readiness programs eg barista, retail etc	Multicultural meetings & groups	Family fun nights
Young people arranging music performances	Homelessness support and advice/advocacy	Active after school	Short general interest courses	Share your pets events	Budding writers' and poets group
Sub groups formed, each with a different leader	Safety in the home	Allied health services information sessions	Financial or budgeting classes	National Volunteer Week celebrations	Shared BBQs
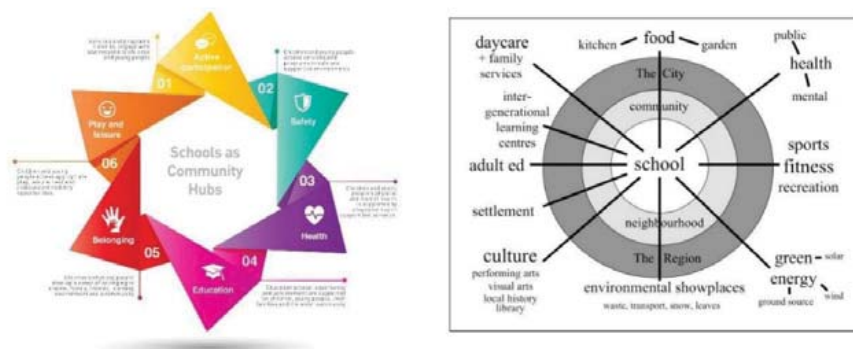
Figure 11. In this section, an example of what school as "Community Center" might look like in practice is depicted as a result (Persse, 2017)

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From urban tissues to special buildings and public squares: architectural design experimentation in Pera, Istanbul

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Abstract

Pera, the Genoese urban settlement in Constantinople from 1303, despite the long Ottoman urban development, still beholds some of the morphological characters typical of western historical cities, (Conzen, 1960), (Mitler, 1979). This paper illustrates a design case study based on the typo-morphological design approach (Caniggia, Maffei, 2001). We founded the undergraduate design studio held at Özyeğin University (Spring 2018) on the hypothesis that the transformation of urban tissues is inevitable and necessary (Strappa, 1995). This modification can happen in continuity with the diachronic evolution of the context, as an organism (Strappa, Carlotti, Camiz, 2016), or in complete opposition to this processual sequence becoming a substitution. We used the formation process of the urban tissue as a model for the design process (Camiz, Carlotti, Dìez 2017), by recasting some of the adjacent demolished row-houses into a special building with an inside courtyard (Palazzo), but adopting a contemporary architectural language. The project herewith presented includes also the recasting of part of the urban tissue into a conference hall, in a diachronic sequence with is typical of the formation process of churches within western monasteries and the transformation of urban tissues into public squares by demolition (Camiz, 2016).

Introduction

The fourth term undergraduate design studio held at Özyeğin University is based on designing in a historical urban tissue. Throughout the term, students learn to read an existing urban tissue through various analysis methods and techniques of representation thus they can grasp the importance of the context. Herewith the studio of Spring 2018 takes the formation process of the urban tissue as a model for the design process in Pera, İstanbul. The urban tissue of Pera has a long history respectively with Megarans, Byzantions, Venetians, Latins, Nicaeans, Pisans, Genoese, and Turkish. Formed by many different communities since Late Antiquity, the settlement resulted as an appropriate ground for students both to practice their skills on reading the long term transformation process of the tissue and to design the next step by considering their evaluations of the context.

Brief history of Pera

It is known as the first mark of human settling on the opposite land of Byzantium, there was a small inhabited area on the north of Golden Horn towards the end of the Late Antiquity, named "Sykai" or "Peran en Sykais"[1] (Eyice,1969). The only archeological traces found and exist today belong to the ancient era of the region is a large cistern with roughly shaped pillars and collapsed dome or vault ceiling, approximately from 5th century. Other than the cistern, the open water reservoir of Saint Benoit, underground water canals near Rüstem Paşa Kervansarayı and the Honorius Baths close to Karaköy Square are mentioned as infrastructural elements in 1540s but no traces left behind. Later constructions that reached the present day includes ancient remains such as statues, pillars and inscriptions from 1st – 4th centuries as spolia (Eyice, 1969, p. 9-10, Sağlam, 2018)

How far the boundaries of this settlement extended is still not known, but it is said this area became a part of the city during the re-organization process on the reign of Theodosius II and became the XIIIth Regio (Eyice, 1969). According to records "Regio XIIIth" was including one church, a forum, a theatre, a dockyard, 431 houses, a large portico, "Baths of Honoius" and five private baths, one public and four private mills (Alciato, 1552; Eyice, 1969, p. 9-10; Müller-Wiener, 2001, p. 320). After the Fourth Crusade (1203) diverted against the Byzantine Empire, the port of Pera was occupied and as Villehardouin wrote "The counsel of the barons was that they would lodge in the port in front of the tower of Galata (Tor des Galathas), where was held the chain barring the Golden Horn… and the barons realized that unless they conquered this tower and broke this chain, they would all be dead and ill-fated. So they lodged at night in front of the tower and in the juerie which is called Estanor, where there was a city quite good and quite rich." The fortification of Galata built during the period of Tiberius II Constantine was called "kastellion tou Galatou", where the chain protecting Golden Horn by extending between the castle and the coast where the imperial palace of Byzantium.

The Genoese have settled to Pera in 1267, therefore the Venetian fleet known as "Malabranca" attacked Genoese entities along Aegean Sea and Galata during the Byzantine-Venetian War of 1296 – 1302. Following this incident, the Genoese demanded to have a secured settlement in Galata and gained the right to build houses with necessarily strong and secure in 1304 but constructing any kind of defense wall or a castle was not allowed. In 1316, they gained the right to build surrounding moats, meanwhile Genoese were violating the articles by building walls among strong houses which ended by encircling Galata at 1335.

With the conquest of Constantinople by Ottoman Empire, the era of semi-autonomy of the Genoese colony ended. Despite the long Ottoman urban development, the area still signifying some of the morphological characters typical of western historical cities (Conzen, 1960), (Mitler, 1979). Galata had its "Palazzo del Commune" like every northern Italian town, located in Voyvoda Street (now Bankalar Street), built in 1315 by being modelled on the "Palazzo S. Giorgio" at Genoa (Mitler, 1979).

Evliya Çelebi (431-433) described Galata as stated below (translated by Mitler,1979):

"From the seashore to the Tower Gate on the north, an hour's ascent, there are Genoese stone buildings, row on row. The main roads are set out like a checkerboard [i.e.,

parallel], all of the public roads numbering 1,160. Outside the castle are the great road along the shore, Voyvoda Street, Harbi [Enemy Infidel] Street, and Tower Door Street. They are all narrow lanes. The Molla Lane and Seyid Ali Çelebi Lane together with Rüstüm Paşa's Inn are the work of Sinan the Architect. There are no vineyards or gardens in the town."

The "checkerboard" tissue reached the present day in the first concession zone, also the demolished Galata Walls covering the zone are still perceivable on the map as borders and irregular housing plots. İnalcık interpreted the visible grid of the urban tissue as a characteristic of the original Genoese city (İnalcık, 1998, p. 293). The orientation and plot shape of the Franciscan convent with San Francesco and Sant'Anna raises the possibility of a Genoese foundation with a grid plan from the beginning of 14th century. Moreover, later period churches like San Michele (c. 1326) and San Domenico (c.1323-1337) are also oriented according to the grid tissue (Sağlam, 2018). Furthermore, Akyol (1998, p.26-28) asserted this layout might remained from the ancient periods of Sykai, which was first established by the Greeks from Megara which also established Byzantium. If the grid plan of the tissue inside Galata city walls would be measured with actus domus (20 piedi = 17.76m), it would be seen that tissue has been established accordingly with Roman land division system (Centuriation). The average of the building plots are 5.7 meters wide and 12 meters long, which is in same dimensions with characterizing row houses in dense Italian cities such as Genoa, Rome and Florence (Caniggia, Maffei, 2001). Especially in the Perşembe Pazarı region which is the project site of this educational design studio, the urban tissue consisted of row houses in a grid layout is still perceivable.

The current situation of desolated Perşembe Pazarı is creating a suitable environment for experimenting the formation process of urban tissue with diachronic sequence for educational purposes. According to the Analytical Study and Study Report (Analitik Etüd ve Çalışma Raporu) done by Istanbul Metropolitan Municipality in 2014, 11,8% of the buildings in Perşembe Pazarı are in good, 47,3% in moderate and 37,1% in poor condition. Buildings abounded by industrial mercantile shops, remains of demolished city walls and empty building lots are constituting the tissue of the area. Currently, 34,1% of the 438 mercantile businesses in the region are consisted of hardware stores, followed by machine equipment stores by 13,2%, ship equipment stores by 8,3%, metal product shops by 8%, manufacturing sector by 6% and other sectors less than 5% per each (Perşembe Pazarı Social Impact Assessment, 2017).

Methodology
The architect's traditional role as "constructors of exceptional products and creators of new forms in opposition to methods used to produce buildings before each" (Caniggia, G., Maffei, G.L., 2001, p.31) lasted until late seventies when the first discussions on gaining equal rights to citizens such as The Right to the City (Lefebvre,1967) started to be prominent. As Robert Park remarked, city is the most successful result of the efforts spent by manhood on turning the world more suitable for his wishes (Park, R., 1967, p.3). The design of environment is strongly associated with humanities and "much of a town is the result of an ongoing process of intangible choices and desires and slightly more tangible activities, the town is also a physical entity" (Kropf, K., 1996, p. 250).

The traces of the human activities are mostly perceivable on the existing tissue of the city for whom can read. In a metropolis such as Istanbul, the traces of different cultures are not only the remains of the past but a part of a living organism under an ongoing process.

Reading of urban tissue has a long history of being used as a tool in universities for educational purposes, in professional negotiations and public participation in urban design projects (Hayward,1993). Territory is materia signata, a base which man consciously acknowledges and transforms. The idea of territory is about the connection between the notion of natural land and artificial transformation made by man, transforming and adapting the land to living requirements (Strappa, 2016). In 50s, active study of the territory as a historically identified organism has been taken a step further by the school foun-

ded by Saverio Muratori in Italy (Strappa, 2016). The main idea behind this school was all forms of the territory and the city are the result of a process, of the progressive, systematic association of the parts, and that it makes sense to break it down and investigate its components only if we take into account its essential unity and indivisibility (Strappa, 2016). Considering the long history of Pera under administration of Genoese and the Italian character that Galata exhibits even today with many archeological remains, the principles of Italian school of urban morphology has been followed to generate the framework of the methodology for the studio.

This design studio is founded on the hypothesis that the transformation of urban tissues is inevitable and necessary, but it can happen in different ways: in continuity with the diachronic transformations of the context as an evolution (Camiz, Carlotti, Dìez 2017), or in complete opposition to this processual sequence becoming a substitution. The study presented here is located in the area named "Perşembe Pazarı" (Thursday Market) between Galata Bridge and Atatürk Bridge on Galata waterfront (Figure 1), characterized with a cavernous tissue of adjacent row-houses. As a case study of the transformation of the contemporary metropolis, we continued the diachronic transformation process by recasting some of the adjacent demolished row-houses into a special building with an inside courtyard (Palazzo) while adopting a contemporary architectural language. By recasting a part of the urban tissue into a conference / concert hall, in a diachronic sequence with is typical of the formation process of churches within western monasteries and the transformation of urban tissues into public squares by demolition (Camiz, 2016).

Reading Pera

Before the site visit, students were asked to prepare an invention poster about the region they will be working in (Figure 2). The aim of this exercise is to divulge both their past knowledge on the area and analyzing techniques they brought from their past studio experiences, also to promote brainstorming among the classroom. Following the site visit, each course consisted of two stages. The first one was research based, after each lecture, students used their new skills on exercises given prepared for the topic of the day. In the second step, students developed design proposals taking into account the individuated place's identity.

During the term the students learned to work on three different scales respectively; territorial, building scale, urban block and building scale again for the design proposal. To follow the steps of humankind on founding the settlements, they re-established the territorial organism of Istanbul on a topographic map by defining ridges, cross-ridges, high promontory settlements, connection roads, low promontory settlements then compared the result with the existing territory (Figure 2). Following the courses on the formation process of courtyard house and row house, they designed a row house on a process as an exercise for understanding the evolution of the meaning of house and grasping the fundamentals of designing a dwelling in a dense urban tissue.

After the lecture on formation process of the urban block, students continued the formation process of an imaginary urban block consisted of row houses into a Palace. This step was crucial for improving the awareness of students on the reading the morphological evolution of urban tissues. Since the project area was a residential settlement formed inside of city walls, mostly consisted of row houses, which are the foundation type of the region, the main aim of this exercise was to establish the diachronic evolution of the context as an organism as the layout for design.

Designing the next step as a diachronic transformation

The second step of the studio was designing a building for the current needs of the historical area now being used as an industrial estate. Located in the cultural center of İstanbul, one step away from the historical peninsula, yet by being covered with industrial shops and their depositories, the project site is convenient for placing a conference/concert hall. This stagnant and desolated neighborhood which doesn't include any residents was the subject of several renovation projects prepared by the Directorate General of Cultural Assets and Museums therefore none of this projects has been implemented.

,While the poor condition of the historical civil architecture examples is giving an uncanny appearance, the area has a strong social structure between shop owners.

Students identified the empty areas in the cavernous tissue of Perşembe Pazarı, then re-designed the area both by removing the existing structures without proper attributes in poor condition and by regenerating the missing variants from scratch by following the traces of antecedent row houses. The working area was consisting of two plots facing the same street. While the northern part was selected for specializing into a Palazzo, the southern part closer to shore has been transformed into a public square. The design process of the Palazzo continued by creating a circulation path on the pertinent strip for connecting each row house that will be another unit. The string of rooms shaped along the courtyard has been cut on the pedestrian level for providing access to public square by following the axis of the street encountering the building orthogonally. The northeast corner closer to the city which is on the main polarity of the lot designed as a restaurant on the ground level and a library on the first floor. For providing enough space to each function defined by the student in a building scenario, the pertinent area was moved to east to provide an open courtyard for the restaurant and southwest corner of the space was left for the conference hall (Figure 3).

While the southeast part of the building narrowed into a portico and designed as a gate facing the public square, this public square took shape as the extension of the courtyard belong to Palazzo (Figure 4). The building completes the formation process of the churches within western monasteries with the conference hall on the nodal position. The façade of the building took shape pertinently with the functions, solid walls with small openings for conference / concert hall and staircase, also a permeable gate closing by a metal door moving upward-downward which is indicating the inner courtyard. Materials used on the façade such as brick, metal frames and exposed concrete were chosen to recognize the building as a new addition in accordance with the features of the environment. As the result of the term, a conference hall with rooftop concert area, recording studios, classrooms for several courses, a library and an archive can hold up to 400 books has been conceived.

Conclusion

How to design in the borders of an ancient settlement located at center of a metropolis is a world-wide contemporary question to be answered. Initiating the notion of supplying the current needs of society and preserving the heritage of the city at the same time is an important aspect in architecture education. The method proposed here based on following the formation process of the urban tissue is taking the historical background of the city into consideration by adopting a contemporary language to design for meeting the needs of today and future.

Figure 1. The working area and location of demolished city walls. The living organism Beyoğlu-Pera, Architecture Design Studio III, Faculty of Architecture, Özyeğin University, lect. A. Camiz, asst. Ö. Özkuvancı, Spring, 2018-2019.
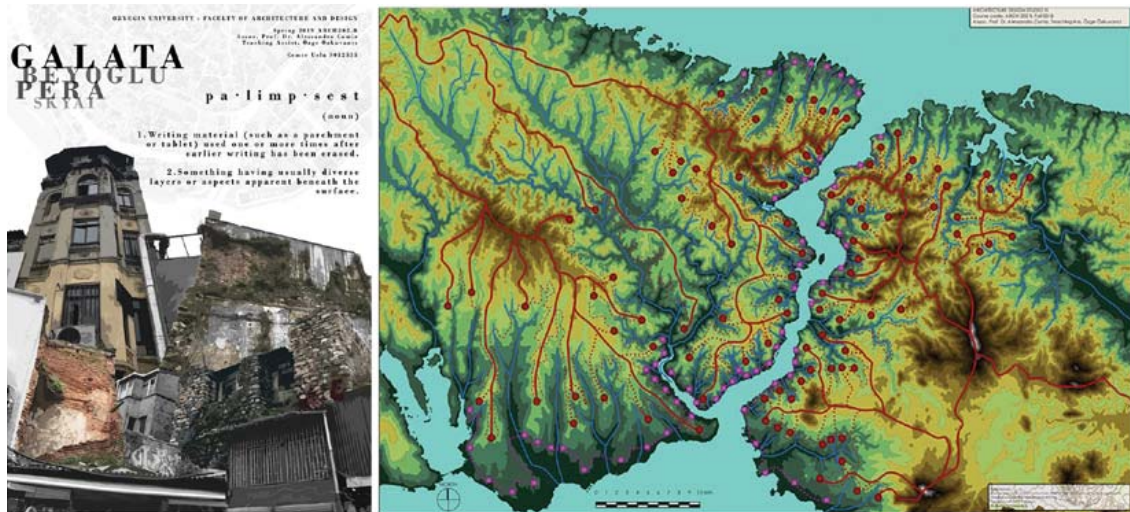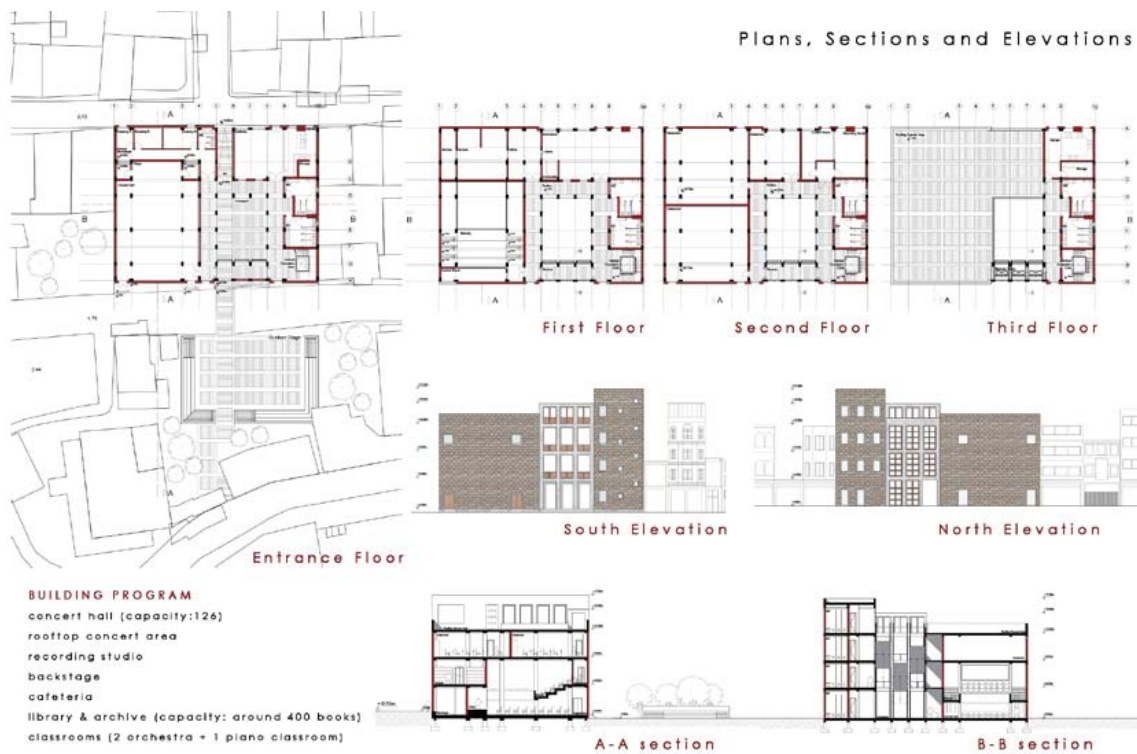

Figure 2. Reading of Pera, C. Uslu, The living organism Beyoğlu-Pera, Architecture Design Studio III, Faculty of Architecture, Özyeğin University, lect. A. Camiz, asst. Ö. Özkuvancı, Spring, 2018-2019.

Figure 3. The formation process of the project, C. Uslu, The living organism Beyoğlu-Pera, Architecture Design Studio III, Faculty of Architecture, Özyeğin University, lect. A. Camiz, asst. Ö. Özkuvancı, Spring, 2018-2019.

FIgure 4. Architectural drawings of the project, C. Uslu, The living organism Beyoğlu-Pera, Architecture Design Studio III, Faculty of Architecture, Özyeğin University, lect. A. Camiz, asst. Ö. Özkuvancı, Spring, 2018-2019.

Footnotes

[1]Means "The Fig Grove on the other side".

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Urban morphology and critical reconstructions: the case of Friedrichstadt

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Abstract

Friedrichstadt is a neighbourhood of Berlin characterized by an heterogeneous fabric. Its northern sector consists indeed of regular and relatively small blocks with closed perimeter, while in the southern one blocks are bigger and more open to the street. This difference is not much due to the Berlin Wall, which split Friedrichstadt for almost thirty years, but rather is a feature of the district that already emerged along the eighteenth century. At that time, the urban fabric in northern Friedrichstadt resulted from a compact, regular grid, while in the south, where living and agriculture coexisted, blocks were bigger and irregular. Even though both halves of Friedrichstadt were outcomes of baroque planning, the blocks in its southern part resulted from later interventions where priority was given to the search for endless urban perspectives, which a regular grid of small plot would have prevented. A considerable difference within the structure of Friedrichstadt endured until the twentieth century, before the Second World War razed most of the district. With the critical reconstruction of both sectors, conducted in accordance with the historical urban plan, also the gap between their structures was restored. Indeed, the different approaches followed in the reconstruction of southern Friedrichstadt in the eighties, conducted by the Internationale Bauausstellung (IBA), and of both Dorotheenstadt and northern Friedrichstadt in the first half of the nineties, introduced further disparities for their different focuses. While the critical reconstruction of the IBA mostly concentrated on the urban block, the plans of the nineties focused again on the plot, almost ignored by the IBA. The research retraces, considering both bibliographical sources and historical plans, the development of Friedrichstadt and provides a critical retrospective to the approaches of its post-war reconstruction, to clarify the reasons behind a dualism of the neighbourhood still perceptible today.

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Introduction

After the end of the Second World War, the issue of urban reconstruction assumed in few European cities the proportion it reached in Berlin. Here the city was not only strongly damaged, but also divided for almost thirty years through the Berlin Wall, and lost this way much of its former identity. Among the areas that were mostly affected by both bombings and the division of the Wall was *Friedrichstadt*, central neighbourhood of baroque foundation, which lost its former lively cultural, commercial and administrative character. Today, even though the Wall does not divide *Friedrichstadt* anymore, a dualism is still perceptible. Moving from its northern to its southern half, indeed, changes not only the name of the borough - from *Mitte* to *Kreuzberg*- but also the features of the district itself. In Kreuzberg, southern of *Zimmerstraße*, where the Wall used to run, the dense network of streets and the liveliness of the commercial and touristic *Mitte* is gradually substituted by larger blocks as by a tangible prevalence of residences over public buildings. Although this dualism could easily be attributable to the former physical division of the district, it is as old as Berlin´s *Friedrichstadt* itself. Undoubtedly the Wall reinforced the differences, since both halves of *Friedrichstadt* were rebuilt under different contingencies, yet the structural gap has its roots in the baroque era when the neighbourhood was founded.

The intention of this paper is to retrace the most important stages in *Friedrichstadt's* development until today, to clarify both its most ancient differences and how its reconstructions exacerbated a dualism already readable in historical maps.

Methodology

The subject addressed in this paper is part of a broader doctoral project on the critical reconstruction of the IBA Berlin and, in particular, on the reinterpretation that the IBA proposed of the historical Berlin block[1]. The present contribute focuses on one of the most important IBA's areas of intervention - *Friedrichstadt* - considering both its historical development and the approaches of its post-war urban reconstructions between the eighties and the nineties. Through the analysis of historical maps and selected texts as well as through redrawings, the paper moves from the scale of the neighbourhood to then consider the size of the block and the plots within it, to clarify the peculiarities of a piece of Berlin that is still waiting for adequate interventions to recover its original identity.

Friedrichstadt. Foundation and early development

Built between the end of the seventeenth and the beginning of the eighteenth century, *Friedrichstadt*[2] was planned as the third urban expansion of the historical nucleus of Berlin and Cölln, following *Friedrichswerder* (1662) and *Dorotheenstadt* (1674).

The northern part of *Friedrichstadt* was the first one to be realised, from 1688 onwards, planned by the architect *Nering* (1659-1695) according to the wills of the Elector Friedrich III (1657-1713), who later became King Friedrich I of Prussia with the proclamation of the *Reich* in 1701. The expansion was conceived in ideal continuity with Dorotheenstadt [3] with orthogonal streets, parallel and perpendicular to the axis of *Unter den Linden*, and with regular blocks 125 until 150 meter long and around 75 meter wide (Peters, 1995).

The completion of *Friedrichstadt*, with its southern enlargement, followed between 1732 and 1737 and was designed by the architect *Gerlach* (1679-1748) according to the wishes of the king Friedrich Wilhelm I (1688-1740). Whereas northern *Friedrichstadt* was planned with similar features to *Dorotheenstadt*, the logic behind its southern extension was different. Instead of defining a regular urban grid, indeed, here the design of the urban enlargement started with the extension of the axis of *Friedrich-* and *Lindenstraße*, to which a third one was added –the *Wilhelmstraße*- to create a symmetrical system of longitudinal streets converging in the south in a round square, a "Rondell", later named "Belle Alliance Platz" after the victory over Napoleon in 1815. Transversal minor streets followed later, thus defining smaller urban blocks, whose dimensions were still very different, with a lenght of more than 400 meters, from the small and regular ones of northern *Friedrichstadt*. This situation is well depicted in the *Schmettau's* plan (Fig. 1), drawn in 1748, where is also evident how the huge blocks in the southern part of the district were built only along their long perimeter and left space inside of their courtyard for huge gardens. The latter however, differently from those of the smaller blocks of the nobility in northern

Friedrichstadt, were not used for leisure, but as kitchen gardens instead, to meet the food demands of a growing city (Biller and Schäche, 1980).

The different planning approaches that shaped *Friedrichstadt* led obviously to typological consequences. In the design of its northern *sector* the Elector Frederick III ceded to the future dwellers not only the building rights (as in the case of *Dorotheenstadt*), but also the ownership on the plots. Legal provisions on the buildings were limited to exterior appearance: they had to strictly adhere to the planning of the architect *Nering*, respecting a uniform height of two storeys and directly facing the street, leaving the inner part of the plot free. Beside, the freedom left to individual owners to build their houses within their plots allowed them to define them individually, making changes to the common typologies of the five- and seven-axes houses (Hoffmann-Axthelm, 2011).

The building of southern *Friedrichstadt* occurred under different circumstances. Here the king Friedrich Wilhelm I firstly took direct control of the construction initiatives, directly financing the realisation of two-storey buildings along the perimeter of the huge blocks south of *Kochstraße*. This way a series of buildings with uniform fronts was built in a short timeframe, giving an impression of endlessness and thus fulfilling the expectations of the sovereign, who wished "his" *Friedrichstadt* to stand out from the uniform regularity of its northern part (Biller and Schäche, 1980). As important as the desired optical effect was, for the sovereign, that the district soon reached a considerable amount of inhabitants. In order to quickly populate *Friedrichstadt*, he disposed that from every building in the city housing four families one of the latter had to move in the new neighbourhood and, furthermore, that soldiers from the Prussian troops had to be housed in the new buildings (Biller and Schäche, 1980). The historical social mix of *Friedrichstadt* has its origins here, where craftsmen and soldiers were joined by the upper class of lawyers, who were obliged to reside near the *Kollegienhaus*, designed by the architect *Gerlach* in 1735 along the *Lindenstraße*. This dwellers' heterogeneity was soon reflected in the changes made to the traditional housing typologies, especially in terms of width of both plot and house as well as in their inner organisation and height, to the point that Hoffmann-Axthelm already distinguished, referring to those years, among the "craftsman's", "the burgher's" and the "noble" house "or public building" (Hoffmann-Axthelm, 2011).

Growth of the neighbourhood until the twentieth century

The freedom left to private individuals reinforced thereafter, with the rise of the bourgeoisie. This phenomenon reached its peak at the end of the nineteenth century, when almost all the land passed into the hands of private owners who started building for speculative purposes. Thus, throughout both northern and southern *Friedrichstadt*, a gradual but constant transformation of the houses took place, where the two-storey limitation in force up to that moment was modified according to the will of owners mostly belonging to the middle class (Biller and Schäche, 1980).

What undoubtedly characterized the typological evolution of Berlin's residential architecture during the nineteenth century was the spread of tenements, first four and then five storeys high[4], resulting from the merging of several adjoining plots. It was already at the end of the eighteenth century that the first state rental houses appeared, the so-called *Immediatbauten*[5], whose construction was promoted by King Frederick II (1712-1786). In the following century the construction of large rental houses, no longer financed by the state but privately instead, reached enormous proportions. This phenomenon soon affected the whole of Berlin, both the new expansions regulated by the *Hobrecht Plan* of 1862 as well as older districts, with serious consequences for the quality of life within the blocks, which were built, in view of mere speculative purposes, with excessive density and for too many tenants. This process interested in a first moment especially northern *Friedrichstadt*, which, already in the first half of the nineteenth century, turned from a residential district for the high-middle class into an outstanding densely-built administrative and commercial area in the heart of Berlin.

If in the eighteenth century blocks still had inner gardens, by the turning of the century more and more constructions were built within the plot until blocks got almost completely filled. Southern *Friedrichstadt* kept on offering instead, behind his continuous street fronts, big gardens that attracted the middle class, eager to escape from the chaotic northern

part of the district. Only later, when almost no space was left in northern Friedrichstadt to realise more public buildings, these started being built also in its southern part, which thereafter rapidly lost its empty courtyards in favour of an increased density of buildings within the blocks (Fig. 1).

By the end of the nineteenth century, when Berlin already turned in the "city of stone" described by *Hegemann* (1963), the newly born typologies of the office and of the commercial building spread throughout both northern and southern Friedrichstadt, flanking the former residences together with newspaper offices, industrial and administrative buildings (Schäche in: Burg, 1994). From that moment on, the urban structure of Friedrichstadt did not undergo any significant changes either on the layout of the streets or on the *Blockrandbebauung* (perimeter of the block). However, narrowly considering typological aspects, its development continued throughout the first decades of the twentieth century until the Second World War. Most of the changes occurred within the blocks, where several plots were merged together to build larger public buildings.

In the years of the *Weimar Republic* (1918-1933) and of National Socialism (1933-1945) no significant changes affected *Friedrichstadt's* urban form, but the merging of the plots continued. This procedure created the premises for the construction of large buildings like the *Gauarbeitsamt*, today's *Bundesagentur für Arbeit,* between *Friedrich-* and *Charlottenstraße*. Beside, another remarkable novelty in the years of National Socialism was the conversion of some historic palaces in the north of *Wilhelmstraße* into important centres of the Gestapo and of the SS. Due to the presence of such strategic buildings, *Friedrichstadt* was intensively bombed in the Second World War, to the point of being practically unrecognizable at the end of the conflict.

Urban reconstructions in the divided city (1950s-1989)

Berlin's administrative division among the four winning powers in 1949, but especially the physical one that followed with the construction of the Wall in 1961, soon made clear that plans for an entire city, like those designed for the competition "*Hauptstadt Berlin*" of 1958, could not be realized.

Friedrichstadt was cut in two by the Wall that ran along *Zimmerstraße*. Northern *Friedrichstadt*, together with *Dorotheenstadt*, ended up under Soviet control in East Berlin (GDR), while the southern half was included in West Berlin (FRG). It is interesting to evidence that the Wall developed along *Zimmerstraße* (Fig.3), thus almost resuming, parallel only one road further north, the historic axis of *Kochstraße* that used to mark, in the baroque time, the end of Nering's northern *Friedrichstadt* and the beginning of Gerlach's southern one. With the building of the Wall both halves of *Friedrichstadt*, formerly a unique - even if heterogeneous - central district, suddenly found themselves in disarray and became peripheral areas of their respective half of Berlin. Because of that they were given lower priority in the earliest urban reconstructions conducted between the sixties and the seventies. Among the transformations that affected *Friedrichstadt* in those years, the change of its historical axis deserves being mentioned: only *Friedrichstraße* continued to terminate in the *Rondelle*, renamed *Mehringplatz*, while both *Wilhelm-* and *Linden-straße* were diverted, thus completely altering Gerlach's baroque design.

It was not until the eighties that the discussions on the possibilities of a reconstruction of *Friedrichstadt* began to be flanked by concrete initiatives, both in West and East Berlin. Southern *Friedrichstadt* was included among the working areas of the *Neubau* sector of the building exhibition known as *Internationale Bauausstellung Berlin* (IBA) 1984-87. Focusing on the restoration and renovation of damaged buildings (*IBA-Altbau*) as well as on the design of brand new ones in areas razed by bombings (*IBA-Neubau*), the IBA worked according to the historical urban structure instead of denying it as Modernism did. The building exibition undoubtedly marked a trend reversal in reconstruction practices in West Berlin. Firstly, it aimed to make historical central areas, like *Friedrichstadt*, again suitable and attractive for residences. Furthermore, it aimed at achieving this goal by reconstructing the destroyed areas with reference to their former urban plan and to the historical image of the city (Kleihues, 1993).

The IBA can be considered as the greatest opportunity for large-scale application of the international debate, developed since the late sixties and throughout the seventies,

on the recovery of the architecture of the city. The IBA assumed both the ground plan of the late nineteenth century, therefore the former *Blockrandbebauungen*, and the historical eaves heights of its buildings (about 22 meters) as referencial features that the new project had to respect. Nevertheless, the compliance with these aspects did not prevent new projects -while still respecting history - from being modern and experimenting solutions suitable to their time. This approach, which overtly aspired to reconstruct Berlin by means of a compromise between tradition and modernity, and not, therefore, reconstructing everything exactly as it was, was defined by Josef Paul Kleihues, director of the IBA-Neubau, as "critical reconstruction" (Kleihues, 1993).

Meanwhile, East Berlin was working on the reconstruction of northern *Friedrichstadt*. Architects in the GDR, like their colleagues in West Berln, also considered the former features of the neighbourhood, respecting both the historical *Blockrandbebauung* and the eave heights, assuming as reference for the latter - like the IBA - the 22 meters of the buildings of the late nineteenth century. Therefore, altough differently from the IBA, also northern *Friedrichstadt* pursued its own critical reconstruction, even if there seems to be no official evidence of contacts between the architects of the two halves of the city (Bodenschatz et.al., 1995).

What substantially changed, both in East and West Berlin, and was not restored in the eighties, concerned the ownership of the land. If in East Berlin, indeed, it was the socialist government that banned the private property, also in West Berlin the first years after the war were marked by a constant erasing of the land division to allow the construction of big projects (Bodenschatz et. al, 1995). In West Berlin, hence not so differently from the East, much of the land was property of the government, in this case the *Land Berlin*. In this context, despite dealing with the importance of both blocks and single houses, the IBA concentrated on the former and assumed it as the basic unit of its reconstruction, without dealing much on the restoration of any land division.

It is interesting to notice how Kleihues, in listing the principles of its critical reconstruction, emphasized the importance of recovering the "*physiognomy of the city*", since in such claim is revealed how the *IBA-Neubau* focused mostly on aesthetic aspects rather than on structural ones (Kleihues, 1993). Some IBA architects even tried to face with the land's issue by means of projects whose fronts simulated a sort of plot division. This is the case of Rob Krier's block in *Ritterstraße Nord*, whose project was split among different architects on the basis of a common masterplan to give the illusion of smaller parcels. Nevertheless, the entire block still corresponded, except a few historical buildings survived to the war, to only two large plots (Fig.4). The *Blockrandbebauung* was restored, but the complexity of the former system of *Höfes* of the renting barracks was reduced to four, very big, courtyards and to two crossing streets meeting in a central square. Similarly to the reform blocks of the early modern, Rob Krier's *Ritterstraße Nord*, as all IBA blocks, defined spaces differently from the historical Berlin block and lacked internal division of property. Hoffmann-Axthelm observed on this point how both IBA and reform blocks share a basic "*misunderstanding of the block as architectural figure instead of as basic component of urban planning*" (Hoffmann-Axthelm, 1997).

Urban reconstructions after the Berlin Wall

The fall of the Wall in 1989 transformed *Friedrichstadt* not less than its construction in 1961. At the beginning of the nineties, indeed, the district found itself once again in a central position in Berlin and in its northern part, former area of the GDR, concentrated much of the earliest planning activities after the reunification. One of the questions, however, which arose for northern *Friedrichstadt* - no longer under Soviet control but not yet under proper control of Berlin's government - was how to handle a still undivided land. Weaknesses relating to large interventions on undivided properties had already emerged with the projects of the critical reconstructions of the eighties, yet the interest in the huge plots available was high and a division of the land in smaller units would have cost too much effort and money. Nevertheless, greater awareness soon arose on the risks linked to speculative interests for the realization of marco-projects, like in the case of Potsdamer Platz, allowed by the availability of enormous plots. It became clear, for Berlin's government,

the need to exercise greater control and directly conduct urban reconstruction initiatives that had to reconsider the issue - hitherto ignored - of the land and of its division.

The work of the early nineties, conducted by Strecker and Hoffmann-Axthelm, brought the critical reconstruction of northern *Friedrichstadt* further from where the GDR left it, improving its weaknesses. Firstly, a set of guidelines was defined concerning both the size of the plots (Fig.2) and the functions to guarantee in the projects the restoration of the former mix of the district. In the critical reconstruction of the nineties the layout referred to the perimeter of the baroque blocks, while the building types -with a maximum height of 22 meters to eaves and 30 meters to ridges- rather referred to the following phase, when the nineteenth-century city overlapped the baroque one filling the blocks and increasing the height of their buildings (Caja and Malcovati, 2009).

Despite greater attention on the issue of land division, it was difficult, in the golden years of Berlin's speculation, to prevent the plots from reaching the maximum permitted size of the whole block (Bodenschatz et al. 1995). After all, many built outcomes of the critical reconstruction of the nineties present again, as Krier's IBA project in *Ritterstrasse*, only a simulation of a division in smaller plots, contradicted by the presence of a common garage under the block. Sometimes the unitary language, as in the projects for the *Friedrichstadt-Passagen*, declares the coincidence of block and plot, while other cases, like Kleihues' projects for *Konthorhaus Mitte*, recur to the principle of the so-called *Baukasten*, to simulate variety in the unity by means of a compromise where different architects designed single houses adhering to the guidelines defined by a superordinate design for the whole block (Burg, 1995). Even Aldo Rossi's block in *Schützenstraße* (Fig.4) does not actually have any plot division, although the colorful partition of its facades aims at giving an illusion of it.

Among the purposes of the critical reconstruction of the nineties there was also to restore the traditional functional mix, to prevent *Friedrichstadt* from becoming a mere office district. Hence the decision to require that each block should offer at least 20% residence. However, a large number of those apartments is used as luxury residences due to their desirable location, thus marking a strong gap with the mostly social-granted residences built by the IBA in southern *Friedrichstadt*.

Little was done in the nineties to remedy to the disparities between the two halves of the neighbourhood. Except for few public buildings, like the *Jewish Museum* or the *Berlinische Galerie*, southern *Friedrichstadt* is less attractive, both for *berliners* and tourists, than its lively, commercial northern counterpart. Even today, indeed, the blocks southern of *Zimmerstraße* lack proper integration between residences and services and look somehow too big, too empty and incomplete. If it is true that these blocks have always been bigger than those of northern *Friedrichstadt*, as shown in this paper, it is also true that the reconstruction of the IBA did not succeed in restoring either their continuous fronts, so essential in their original baroque conception, or their former lively mix of function emerged along the nineteenth century.

Conclusions

Friedrichstadt is still waiting for its reconstruction to be completed, going beyond physiognomic aspects and taking as well into account its former character. Restoring the historical plan is not enough: the former identity of the neighbourhood should be recovered with reference to more precise typological considerations as well as to its historical functional and social mix. Already in the eighties it was pointed out how, to recover its *genius loci*, it was necessary to consider not only the ground plan, but also more complex aspects like the structure of the plots or the former relationship between buildings and courtyards, as well to plan again aiming to create new perspective effects (Engel, 1981). All these aspects, which concurred in defining the identity of *Friedrichstadt* until the beginning of the twentieth century, disappeared due to both bombings and to the mistakes in the reconstructions that followed.

The big void of the former area of the *Prinz Albrecht Palais* is only the most evident and debated of many ones still present in the *Friedrichstadt*, especially in its southern part, waiting to be addressed by proper design interventions. It is necessary to bridge the current gap between the two halves of *the district*: a gap between a northern touristic,

commercial and administrative area and a southern one still full of empty plots and characterized by a prevalence of social residences - today no less affected than the rest of *Kreuzberg* by rental increase- with a lack of services. The restoration of a balanced and positive dualism, the recovery of a *Friedrichstadt* "united despite differences", as in the nineteenth century, is still a challenge that needs to be worked on, necessarily with greater attention to typological aspects.
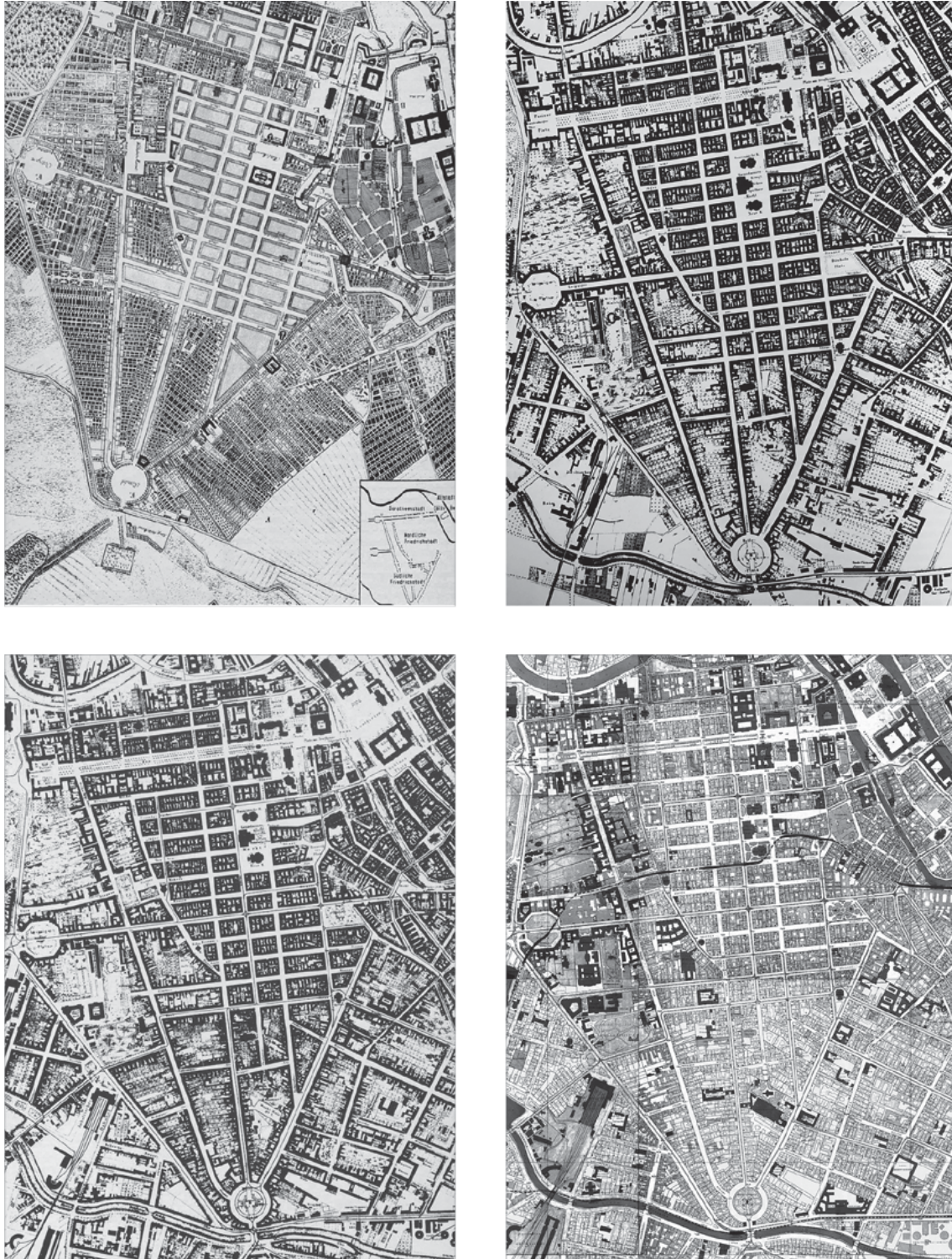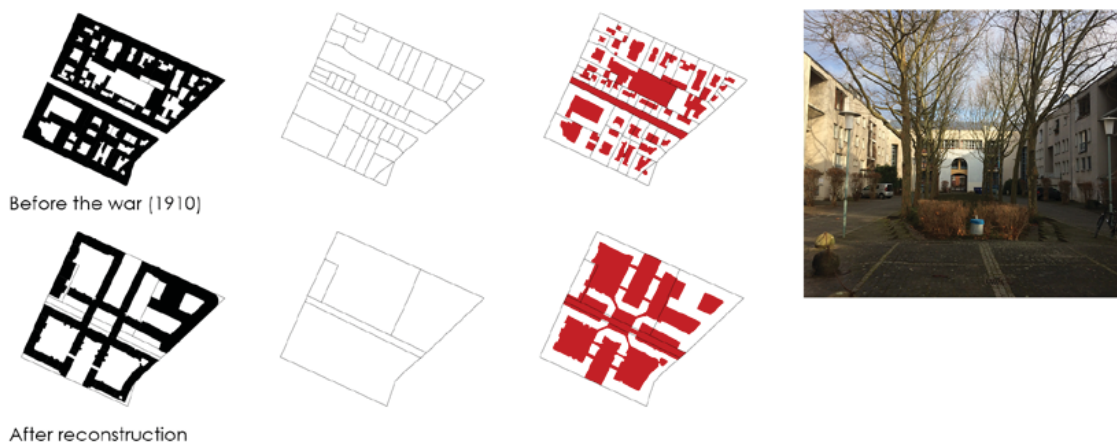

Figure 1.

Figure 2.

Existing buildings before 1980s

Before 1989: GDR's critical reconstruction

Before 1989: IBA Neubau's critical reconstruction

After the Wall: critical reconstruction 1990-1999

Further reconstructions after 1999

Further reconstructions 2001-2010

Further reconstructions 2010-2016

Berlin Wall (1961-1989)

Figure 3.

Wohnanlage Ritterstraße Nord
IBA, sector Neubau
southern Friedrichstadt
Built: 1982-1988
Architect: Rob Krier

Before the war (1910)

After reconstruction

Quartier Schützenstraße
critical reconstruction
northern Friedrichstadt
Built: 1995-1998
Architect: Aldo Rossi

Before the war (1910)

After reconstruction

Figure 4.

Notes

[1] Reference is made to the author's ongoing PhD research "The open Block of Berlin Careful design strategies of the Internationale Bauausstellung Berlin 1984-87"

[2] Friedrichstadt was named after the Elector Friedrich III, under whom its construction began.

[3] A physical continuity among Dorotheen- and Friedrichstadt was prevented by the presence, until 1715, of a system of fortifications around Dorotheenstadt

[4] The maximum building-height allowed by law requirements often changed along the nineteenth century until reaching five storeys with the *Bauordnung* of 1897

[5] For a more precise description of the *Immediatbauen* see : Hoffmann Axthelm (2011), 98-100

Caption

Figure 1: The plans below refer to four different phases in the development of *Friedrichstadt*: shortly after the design of its southern extension by Gerlach (Schmettau Plan, 1748, top left), before the proclamation of the Reich in 1871 (Sineck Plan, 1856, top right), shortly after it (Liebenow Plan, 1888, bottom left) and, finally, at the beginning of the 20th century, shortly before the *Weimar Republic* (Straube plan, 1910, bottom right).

From: IBA Berlin 1984-1987 (ed.) (1980) I*nternationaler engerer Wettbewerb südliche Friedrichstadt. Kochstraße / Friedrichstraße*, (Berlin, IBA)

Figure 2: Comparison between the plot division in Berlin's *Friedrichstadt* before the war (1938) and shortly after the fall of the Berlin Wall (1991).

Plans redrawn by the author (2020) from: Architekten-Verein zu Berlin (ed.) (2009) *Berlin und seine Bauten, Teil I-Städtebau* (Berlin, DOM Publishers) p. 383

Figure 3: Phases of the post-war reconstruction of Berlin's *Friedrichstadt*, from the eighties down to present day, compared with the historical structure of the neighbourhood (light grey in the background). Redrawn by the author (2020) from: *Digitale Schwarzpläne – Senatsverwaltung für Stadtentwicklung und Wohnen Berlin*

Figure 4: Analysis of the relations between voids and buildings and of the plot division - before the war and after the critical reconstruction - of two selected case studies in Berlin's *Friedrichstadt* from the eighties and the nineties. The first case (above) concerns the intervention in *Ritterstraße Nord* designed by Rob Krier in the eighties for the IBA in southern *Friedrichstadt*. The second example (below) refers to the project *Quartier Schützenstraße* by Aldo Rossi, designed as part of the critical reconstruction of northern *Friedrichstadt* in the first half of the nineties.

Drawings and Photos by the author (2019)

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Munich DistURBANce and Urban Sponge
Pathways from a 'Residence City' to a 'Resilient City'

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Abstract

For the reason that it combines a lot of qualities, and further amplified by current global, national and regional developments, Munich has for some time faced a permanently high rate of population increase. Yet the city is completely unprepared for this level of growth. It is surrounded by communities that are financially and politically independent and that offer it no capacity for outward expansion. Facing this, Stenger2 Architekten und Partner created the internal task force "Freiheit 2050" ("Freedom 2050"), whose aim was to spend one year coming up with interdisciplinary ideas for a viable Munich resilience that will, for the time being, span the next 30 years. The force of resilience is, like its priming, not a static event, but rather a time-related dynamic process. Working on a city's resilience means understanding the agglomeration itself as a dynamic system — being able to read it.

Architects in this endeavor, may take the liberty of putting themselves in the roles of generalists who in their work are mediators between representatives of different interests and unifiers of disciplines. Architecture is thus elevated to an important engine for bundling lots of special-interest groups, not least because a city not manifested in spatial construction is inconceivable.

Many such panels all around the world are working with varying degrees of success on individual tasks. "Freiheit 2050" marks a start for Munich, as snapshot that will subsequently always need to be reviewed. Our concern is finding the courage to engage in large-scale cooperation to plan 30 years into the future in order to escape the staccato of acute and short-sighted approaches to problems. And to give everyone involved, foremost the citizens affected, a vision of a city one can become accustomed to.

The problem with Munich

Munich has 1.5 million residents and is thus the third-largest city in Germany.

Its metropolitan area includes 6 million residents.

The Global Cities Index ranks Munich 33rd among the top 60 cities worldwide.

According to the most recent ranking published in 2016 by the Globalization and World Cities Research Network (GaWC), Munich is a global city in the category Beta+.

The city lies in beautiful surroundings. It's affluent, safe, and full of self-confident people.

And it has a problem.

Munich is choking on itself.

Precisely for the reason that it combines all of the above qualities, and further amplified by current global, national and regional developments, the city has for some time faced a permanently high rate of population increase. This will lead to its population of about 1.55 million (2015), according to the city's current demographic report, growing to 1.85 million people by 2035, an increase of 20 per cent (LH München, 2019). Yet the city is completely unprepared for this level of growth. It is surrounded by communities that are financially and politically independent and that offer it no capacity for outward expansion — since the entire metropolitan region is growing in population along with Munich.

Additional sites capable of housing an additional fifth of the population cannot readily be gained on the periphery. Add to this the continual growth of private transport within the city and especially the daily commuter trips by automobile. Right now, every day, 380,000 commuters drive into the city to work, while 180,000 drive out of it. Thus, every working day, 200,000 people are added to the population; all of them, via their cars, demand space — space the city does not have.

Munich's infrastructure, however, dates in large part back to a time of massive construction projects initiated for the 1972 Olympics. For thirty years, Munich's population was nearly constant. The rapid influx of more than 200,000 people since 2006 and the related doubling of commuter trips has by now not only filled many major arteries to capacity, but brought them to the brink of collapse.

The decision to rebuild the main railway station and construct a second trunk line of commuter rail came very late. The continuing increase in the population's need for space and the traffic congestion that accompanies it — along with all the other related problems, such as the growing scarcity of affordable housing, conflicts caused by unregulated consolidation, high concentrations of airborne pollution, noise and congestion — now represent the greatest challenge to the city since the end of the Second World War and the period of reconstruction that followed it.

Motivation

As Munich architects, we at Stenger2 Architekten und Partner work on a daily basis with tasks that are highly contextually relevant. Such a task might be the modification of a building, a change in use, an annex, or even a new building within a more or less dense urban fabric. In approaching it, components, buildings and urban structures — that is, the built context — routinely have to be considered and evaluated according to their present and future capabilities and, as a result of this, according to their complete or partial reusability.

In recent years, we have been working on ever larger scales and have ascertained that the tools used for these projects, like the insight gained from them, can be applied to the scale of the entire city.

Our office thus established an internal task force we call "Freiheit 2050" ("Freedom 2050"), whose aim is to spend a year coming up with interdisciplinary ideas for a viable Munich resilience that will, for the time being, span the next 30 years. As architects in this endeavour, we take the liberty of putting ourselves in the role of a generalist who in his work is a mediator between representatives of different interests, a unifier of disciplines and, metaphorically speaking: a conqueror of language barriers. Architecture is thus elevated to an important tool and an engine for bundling lots of special-interest groups, not least because a city not manifested in spatial construction is inconceivable.

Munich, the 'Residence City'

A conspicuous characteristic of Munich is its alignment, manifested over centuries of urban development, with a geometric centre. The city grew out of its centre and arranged itself around of it. A centre that was anchored to the 16th-century ducal and royal residence prominently adjacent to the Old Town and that has been preserved until today, still coinciding with the area of the historic city inside the former city walls (Pauli, 2019).

What's remarkable is the fact that this primordial cell of Munich now resembles an "amusement park of museums with — very expensive — shopping".

In this sense, the quality of time spent there during the day is very high. By now, however, authenticity and diversity of urban life are found only sporadically. Living downtown is not something regular people can afford; business leases can be paid only by international corporations and upscale law firms.

What's truly disastrous, though, is the fact that not only the network of automobile-dominated personal transport, but also that of public transport, is set up like a target, focusing on the centre. Just like the high culture in the form of concert halls, prominent museums and venues, both universities, the main government agencies and the most important markets are located either directly in the centre or adjacent to it.

The collision of both networks of mobility, or rather their significant degree of overlap, is currently the main cause of the gridlock that is manifesting itself.

The current efforts by local politicians and the city council to install a largely overlapping web of new cycle and pedestrian routes across the city, while expanding public transport but without wanting to significantly limit individual transport by car, have led to strongly palpable public protests, clashes over the distribution of resources, and hysteria.

It is this growing negative mood that has led to a new Munich feeling like that of one's air supply slowly but surely being cut off.

Munich, the Resistance City?

With one of our projects, the KRAFTWERK, a conversion of a former thermal power station in Munich into a hybrid-use neighbourhood hub, we noticed what can be achieved if one knows how to recognize and react appropriately to the "different speeds" of project work.

In so doing, we have identified three main gears in the city's mechanisms.

The smallest, rapidly spinning gear is that of the citizen, with his generally legitimate needs and desires. He requires quick and practicable solutions, ideally at once.

The medium-sized gear is the city council along with the lower level of politics, the neighbourhood representatives. Here, processes take longer, are to be gauged among various positions and are subject to discussion and evaluation.

The largest and slowest-moving gear is that of framework planning and that of the overarching building regulations, even on levels that lie outside the city's sphere of influence.

The vast majority of panel discussions, which currently are being held in rapid succession and with varying participants on the city's future, all too often end in a clash of cultures. On the panels are representatives of the administrative body; within the audience, citizens react angrily to the time frame and plans being put forth. Routinely, the tone is: it's all proceeding too slowly.

At the same time, however, initiatives are being made in many areas in the city. Fresh ideas are sprouting and are being formulated, only to be strangled by harsh criticism a short while later. We want to know why that is. And how it can be avoided.

As architects, we constitute the physical transmission of the gearbox. A unit that can convey the power and force of each ot the three gears of urban development, spinning at different speeds — here the citizens of the surrounding district, there the municipal authorities and above them the political opinion-makers — onto all of them. We've learned that the prerequisite to this is the transfer of information. Resistance to building projects unravels quickly when the participating special-interest groups are brought to the table early and all available information is laid out. This can certainly be fragmentary, as long as it's presented early enough. Bona fide individuals who speak with the authority of

experience then emerge during the discussion, as does the certainty that something is "in good hands".

In our particular project with the thermal power station, the resounding rejection publicly expressed by a few turned into strong approval by many within a very short time. How can this experience be applied to the large scale of the city? We are proposing the composition of a "directive for Munich": a story of the period from 2020 to 2050 which describes a possible 30-year development of comprehensive interdisciplinary measures. An agenda that is thus no longer dependent on the far too narrow time spans between elections. One that achieves political independence. A directive that demonstrates the effects and results, the potential, of a decision made today in 5, 10 and 30 years. For when a city resident is shown that a decision on urban development made today only has a specific and limited effect on him in 5 or 10 years, that this means he's given a chance to adapt, and he understands at the same time that it's less about him and rather about the future of his kids, then a "hindrance protest" will turn into a guiding, fruitful, joint project.

Munich, the Resilience City!

The interesting thing about the term "resilience" is that the withstanding it connotes should not be interpreted as "standing against" something. Resilience is not, for example, erecting a wall to keep out refugees from Central America.

It is the flexible MASTERY of difficult situations without continual impairment of the existing order. Every city, every urban agglomeration, represents an ordered system that is geared towards self-preservation. If such a system faces an external influence it perceives as a threat, the power and force of its resilience become manifest. The decisive factor in this is the accessibility of resources and structures that belong to the existing system and that are prepared and made available by it for this purpose.

The force of resilience is, like its priming, not a static event, but rather a time-related dynamic process. Working on a city's resilience means understanding the agglomeration itself as a dynamic system — being able to read it. This, too, qualifies architects. Many of them have learned over the years, in work on specific projects and through their interdisciplinary network, to decode the built environment and to use their work to re-evaluate the processed context. Only through the shared insights of its historians, urban sociologists, psychologists, urban and traffic planners, developers, experts on energy and waste management, churches, artists and representatives of the citizenry along with many, many more does reading a city automatically result in an exciting informational fabric that is so extensive that the individual can't help but become lost in it. One person alone can neither identify nor solve a city's problems.

Only in collaboration with many is the architect able to provide his pivotal contribution: he can design built structures in and around the city's problem areas which give the city back its freedom of agency. Entities that are ideally fertile ground for other disciplines. Conducive urban fabric for residents in places where the city is in need of repair. Or as we call it: the urban sponge that attenuates a recognized impairment to the urban fabric (distURBANce) or even - heals it.

The impairment to the urban fabric (the distURBANce) — the urban sponge as the solution

Impairments to a system detract from its capabilities and diminish its capacity for resistance. They lead to signs of deficiency — this is just as true of a city as of an organism. But what is affluent Munich actually lacking? Allow us to attempt an overview.

At present, the following, among other things, are lacking:
1. Free parking spaces as alternate room for immobile traffic
2. Solutions to the ever-expanding traffic jams
3. Affordable flats
4. Cycle routes and express routes for cyclists
5. More frequent metro, tram and bus service
6. Individually configurable open spaces

7.   Areas for sport and recreation
8.   Artists' studios and rehearsal rooms
9.   Areas for start-ups and new entrepreneurs
10.   Reasons to stay in town at the weekend

How could it come to this? What are the causes? After a year of research, we can identify the following Munich distURBANces:
•   Unregulated, unmonitored transition between city and countryside
•   Still-prevailing dogma of the city centre
•   Conservation of boundaries and trenches within the built city

The solution to removing these impairments is the urban sponge in the following possible configurations:
•   As MunichHUB (mHUB) to flexibly absorb private automobile traffic from the periphery long before it reaches the city (1)
•   As a polycentre within the city, able to take on functions of a sub-centre as a component of a city comprised of villages (2)
•   As a complement or urban inlay for the sake of repairing an impairment to urban space (3)

It's perfectly clear to us that these architectural means of repairing a city must be accompanied by a web of socio-cultural, communicative, infrastructural and procedural measures and experts with experience in them. The architectural solution can, however, offer precisely the decisive inducement to put the other tools in place for a common task.

The basis of all such developments must be the use of what is today the city's most valuable resource: land and property. The municipality as the representative of its residents must form task forces with everyone involved publicly who owns property within the city boundary: the state of Bavaria, the Federal Republic of Germany, Deutsche Bahn Immobilien and the Federal Autobahn Agency, but also foundations and institutions indebted to the city or that claim the use of tax money, such as churches.

All of them must, for the greater good, reveal their potential and concede usage rights, leases and so on to the public. Only in this manner will the city be capable of taking action. The goal must be to reduce the cost of purchasing land to a minimum in order to subsequently devote the entire budget to the construction project. This will make experimental uses and low rents possible.

Alliances must be forged, in each of which one of the involved parties must be set from the start: the city as an active partner.

It proved only recently what it is capable of. In a very short building phase, a car park belonging to a municipal swimming pool was built over without having been sacrificed. In the aerial space above it, dozens of flats were created that were rented out by a municipal housing association. The critical aspect of this project was: the parking-space statute, which determines how many new parking spaces have to be provided for the new flats, was de facto suspended for this project. That's the great achievement: creating new living space for people WITHOUT expensive measures for unpopular additional cars in the city. It demonstrates the scope for action the city has for its own projects.

The mHUB (1)

The mHUB is the manifestation of the first alliance: between city and countryside, urban area and periphery, affecting the entire metropolitan region. The unchecked increase in commuter flow into and out of the city must be managed quickly and expediently, or else the city will collapse. The daily traffic jams — in contrast even to 2010 — which are an economic and environmental hazard, are no longer tolerable. This is the first stage of healing: the new firewall for Munich. Not as a new city wall, but as support for improved mobility.

The Munich firewall was developed by us in collaboration with ALLGUTH, a Munich

petrol station and service company (Amberger and Stenger, 2019). Like a string of pearls, a series of HUBs arranges itself around the city at the points where the main routes of daily commuters intersect. Each consists of a multistorey car park with a capacity of 5,000 parking spaces and a modern service facility that is able to provide people with daily routine supplies.

These structures take care of the shift in mobility, the transition from periphery to city, from individual transport to public transport. At every HUB, connections to metro and suburban trains must be guaranteed by the realization of additional transit stops.

Express bus routes served with high frequency at least every five minutes as well as express cycle routes interconnect the HUBs and the city. Offers for bicycle and car sharing are guaranteed at every location. All service facilities for the automobiles of the metropolitan area, still necessary for decades, are in place, as are service stations offering the common sources of energy, as are garages, the provision of spare parts, car washes and inspection facilities. To prevent unnecessary downtime, transport and delivery routes, HUBs must include features for commuters that can otherwise only be found in the city, such as medical attention, package shipping and receiving desks, and modest administrative facilities. In this context, reduced-price tickets for public transport and the regional rail network can significantly increase the effectiveness of the mHUB. The goal is to seamlessly guarantee and supply the commuter routes and offer congestion-free, time-saving, stressless arrival at one's place of employment.

In the final phase of expansion after 30 years, as many as 100,000 automobiles could be intercepted before they enter the city. The open spaces that would then emerge in the city are then available for conversion to streets for cyclists, pedestrian routes and green belts. For only in conjunction with the development of the mHUBs will the city be able to develop inwards.

The polycentre (2)

Since its origin, Munich has been a centralized city. The old royal city, with the palatial residence of the Wittelsbach dukes at its centre, was, with regard to the hegemony of its core area, never really modernized, certainly not in a sustainable manner.

Each of the following urban developments subordinated itself to the idea of a centre. Even the buildings for the Olympic Games stand next to a ring road whose midpoint is near Marienplatz.

The hasty incorporation, primarily by the Nazis, of originally self-contained villages surrounding the old city core was accompanied by a withering of the functionality of these former local centres. All important institutions were moved to the city centre.

Munich's fixation with its centre turned into a bottleneck for the city. In the next 30 years, the "city with only one centre" must become a "city of many villages". It must break free of the historically centralized royal city and become a fully interwoven city of resilience.

In our work for Freiheit 2050, it became clear that, even today, the centuries-long focus on the city centre surrounding the historic Old Town affects the cultural, social and administrative quality of districts far from the centre.

At the same time, however, lots of potential locations for polycentres in the urban area presented themselves. These were either historically founded, with a fragment preserved and thus able to be reactivated, or would have to re-emerge in potential spots predestined for them.

A new polycentre must shine and bind new energies. It must be multifunctional, exciting and creative, and be upgraded such that it can be capable of providing diverse services as a centre. Not monofunctional like a shopping mall or an administrative centre, not as a marketplace, theatre, concert hall or food court — but as a conglomerate offering all these and many other functions besides.

For this, at suitable locations, all existing spatial conventions and in particular all public spaces must be put to the test. Not as a compacting effect, but as an enhancement. Multifunction instead of monofunction, even as a creative space, anarchic and heterogeneous. In lieu of many more possibilities of this evaluation of monofunctions, we wor-

ked in small groups to observe various scenarios more closely.

The result of these preliminary examinations are schools expanded to include rooms for senior citizens, homes for the elderly expanded to include day care for children. Cemeteries that become peaceful oases for digital detoxification, public parking garages that while and especially after their purpose is being fulfilled are used as spaces for recreation. Churches that are used outside of masses and prayer sessions as libraries, exhibition spaces or places that relate the history of the neighbourhood. Garden plots that today are fenced in (the 'Schrebergärten') become areas of urban gardening. Austere public squares are given spaces for free and creative development at the polycentre. For all these scenarios, there are proven examples around the world. Nothing has to be invented here, just put into practice. The permanent or temporary appropriation of municipal infrastructure is even today put into practice as pop-up architecture in Munich, a relatively new development for this city.

Starting from the polycentre, the components of living, working and supply must be interwoven anew over the coming 30 years. The city of CIAM, an automobile city, is, as we know today, not future-oriented. A city that is largely on a pedestrian scale must develop on the same level as a living environment.

Beyond this, the development of polycentres offers lots of ways to massively involve residents. They must be a pillar in the design, needs assessment and realization and be active contributors — by demanding a park bench out in front, a new tree in the middle of the square, flowers on a patch of grass, their own surfaces for urban gardening.

In this way, old village centres of former independent settlements can be turned into attractive sub-centres with the power to supply themselves, which makes them interesting to adjacent neighbourhoods as well. They will then compete with the city centre and with each other. Parallel to this, the radial traffic patterns emanating from the city centre are reduced.

Further, through their pioneering work and de-escalation of conflict, the reactivated sub-centres will lead, within their radius of influence and in the entire city, to private and public developments.

The main goal of the new polycentres is, however, to offer sufficient local quality to keep residents not only during the week, but also in their free time, in their neighbourhood. This is the second alliance: that between the city and its population.

The urban inlay (3)

Parallel to the long-term measures of HUBs and polycentres, the plaque in the arteries of our city must be removed. The past has left Munich with dotted, linear or spread-out types of urban spaces within the otherwise conspicuous homogeneity of the city's built-upon body, which have often unfurled without consideration for their neighbourly context.

Venerable spaces such as the Theresienwiese and the English Garden are among these, as are infrastructural spaces such as the broad system of railway tracks between Pasing and the main rail station, but also underpasses, bridges, road troughs and Autobahn junctions, some of which extend well into the city. Planned outdoor areas, such as cemeteries and parks and areas intended to be left in their natural state such as the now partially restored riverbed of the Isar River as well as its robust embankments and angled terrain to the south are further examples.

Along with many structures that have reached the end of their useful life, or have already become obsolete architectural or infrastructural structures, therefore, these spaces and objects spawn sources of irritation along their edges: distURBANces. Urban repair is needed there, by all means even on protected spaces that at first glance appear to be sacrosanct. It is precisely these corners, edges and urban impairments whose repair or removal must be performed spatially, above built structures, constructs that can be used multifunctionally, opening traffic routes closed off at that point, making green areas and urgently needed living space available and at suitable points, on a transitional basis, sufficient space for automobiles to resort to.

What all distURBANces have in common is the fact that they are invisible: the habit

of driving past them often enough makes them vanish from the field of view of the city's residents — until such time as the urban wound they formed is again revealed and made a subject of discussion. Urban repair necessitates not only noticing a distURBANce, but also a dynamic investigation of its potential. The result of this investigation of its potential could be our proposal of an urban inlay.

This subtype of an urban sponge is still under development. The current model is defined by its three components. On the ground floor, contact with a public space occurs, and with it the specialized adaptation to the individual context. This is where we always find the transition between automobiles and going on foot.

The area above the eaves offers the possibility of conquering the city's third dimension. Building structures resolved into smaller pieces merge with pathways of green growth. This "world above the world" is comprised of small interspersed building elements that are stacked, placed in series or staggered, that offer surfaces of motion, that combine the former pedestrianness of a medieval city with a spectacular view. The world of pixels above the rooftops offers multiple creative functions and space for self-fulfilment. It links the intimacy of areas people withdraw to with a public boulevard. It is a green lung and mediates between the hard edges of a city.

In between, the actual material of the sponge is deployed: the static framework of this vertical middle zone is made of joined construction materials that in the best-case scenario could be reused whole. This applies to supports, valances, girders, wall sections. Load-bearing elements, reinforcements, ceilings and access cores will still, for years to come, within densely built cities, be made of concrete mixed on-site, preferably from concrete made from recycled materials.

The number of stories, length and breadth are determined according to context. Inside a framework fitted with plumbing and wiring, basic modules made from renewable or recycled raw materials are placed: boxes and drawers that offer space for differentiated uses.

In this manner, a mesh is created that can be taken over, filled up as needed, designated for living and for housing groups in varied forms, but flexible in its use, its wiring and its occupancy. The housing group is the basis of many of the following scenarios of use. The result of an encounter with a good friend, aged 75, who came to us and said: "What I'd like now is a place where I can spend my golden years with some friends. Each one would have his own room with a bathroom, for when he wants to be alone, but there'd also be a big living room-kitchen-dining room in which we could come together at any time to make music and talk."

In drafting this blueprint, one notices that this basic module of the housing group can be applied to lots of different groups in society, completely independently of their financial background, age, etc. What all of these groups have in common is that if they are able to find housing in today's Munich, it's only with the greatest difficulty and effort.

Aside from the senior-citizens' group described above, this applies to, among others:
- students sharing flats
- flat-sharing among people doing traineeships
- housing groups made up of refugees, including unaccompanied minors
- housing groups for whom accessibility is a priority
- therapy groups
- groups of single mothers
- employees of temporary events: trade fairs, Oktoberfest
- workers during temporary installations
- an initial dwelling for company workers new in town
- the unemployed

Occupancies, that is, that can help those affected, either temporarily or during a particular phase of their life. This is where the city can now practise its responsibility. Allocate the space and allow a flexible management of the occupancy. What a powerful tool it would then have at its disposal! It could use it to provide for the weakest members of society and at the same time offer a large percentage of the 15,000 new citizens who arrive in Munich each year an initial place to stay.

The directive for Munich: Freiheit 2050

The step from recognizing a problem to designing a solution is one we architects are familiar with. Where we routinely fail is in conveying the contents.

"Freiheit 2050" thus means not only the means of architecture and urban planning, but getting an overview of and questioning the most important components of the city's infrastructure. The results of this investigation must be made public as part of after-effects. Important when communicating this subject matter is conveying the temporal and causal dependency of all the points.

A timeline, provisionally over a period of the next 30 years, should be made, which should also be structured according to the "If … then" principle.

It will then be possible to see that a decision made today will have an effect in 5, 10, or 15 years, and that if it isn't made now, what is necessary won't happen in 10 years.

For the citizen, this means:

transparency regarding the contents

the possibility of being involved, similar to the tried and tested procedure of displaying development schemes

the possibility of becoming accustomed and adapting

enough time for weighing individual interests against those of society

transition periods for the institution or withdrawal of regulations and laws.

The goal of this directive for the city must be the maintenance of the three speeds. Contents that require lengthy preparation by (municipal) politicians cannot and don't have to be processed by individual citizens. Conversely, the urgently needed greening of the most beautiful neighbourhood squares should not have to depend on protracted political decisions.

The result is a forward-looking, sustainable and adaptable vision for the future of the city. A flexible master plan for dynamic growth inside its boundaries, an agenda for this city that is so far-reaching that hectic problem-solving is turned into a structural interaction with the challenge of growth. This is the starting point.

The critical thing, however — as shown by professional practice starting with any small construction plans — is that this directive is regularly evaluated and maintained. To ensure this, a panel must be installed that logically consists of all those who do the work of transmission in the three-speed gearbox.

As a temporally limited, continually mixing group of many whose activities overlap and who in their entirety represent the largest possible cross section of the city's population.

Independently of age, income, political and sexual identification. An ethics commission for the greater good of the city, with the power to offer advice and make decisions. A group of orphans who support the operational work of the political bodies of the municipal council just as much as the representatives of industry and the individual citizens.

This evaluatory commission is to draft the master plan for the city, improve it at regular intervals, delete, insert and overall do three things: make the work of municipal politics objectively verifiable, require appropriate action from citizens and open up resources across all rifts by linking employees and employers, industry and the social state, culture and sport.

This notion is neither utopian nor new.

Around the world, there are already many such panels, working with varying degrees of success on individual tasks. Now the summary must follow. With this, we have made a start for Munich. Our work on "Freiheit 2050" is a snapshot that will subsequently always need to be reviewed. What we're concerned with, though, is finding the courage to engage in large-scale cooperation to plan 30 years into the future in order to escape the staccato of acute and short-sighted approaches to problems. And to give everyone involved, foremost the citizens affected, a vision of a city one can become accustomed to.
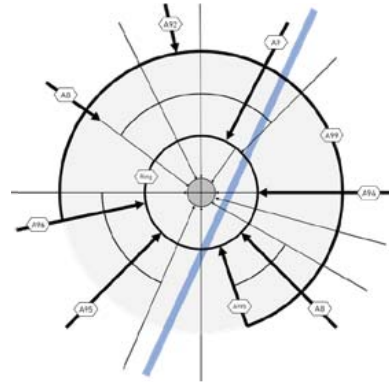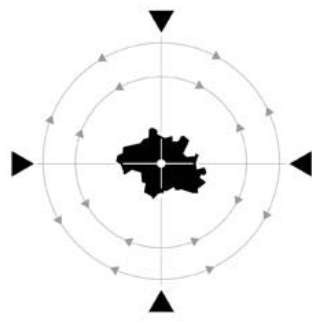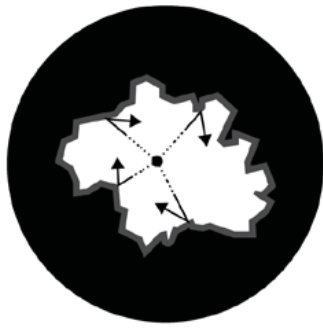
Figure 1. No escape for Munich; **Figure 2.** (right) Commuters daily target.

Figure 3. (left) Sand in the gears; **Figure 4.** (right) The KRAFTWERK - getting rid of a distURBANce.
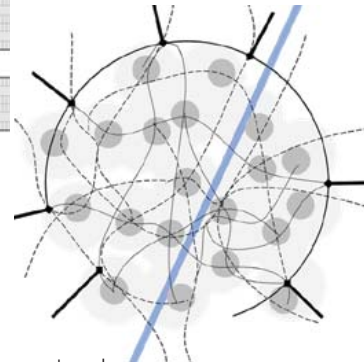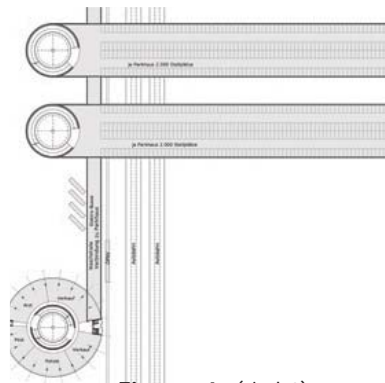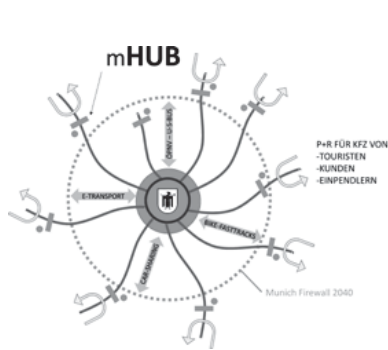

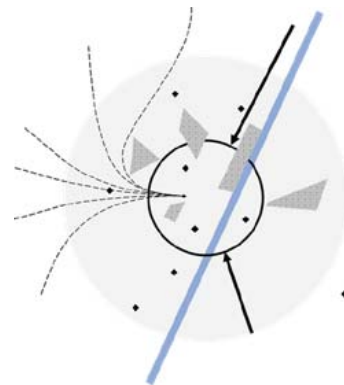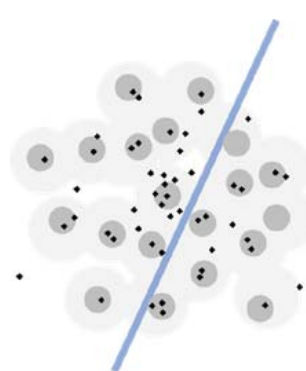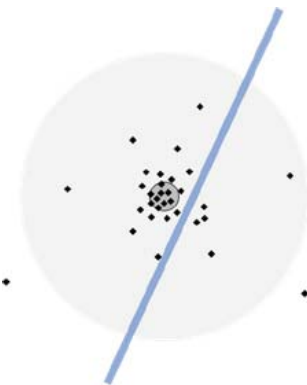**Figure 5.** (left) mHUB and the Munich firewall; **Figure 6.** (right) The new network.

Figure 7. (left) The city of one centre vs. the city of multiple neighbourhoods; **Figure 8.** (right) Types of distURBANces.
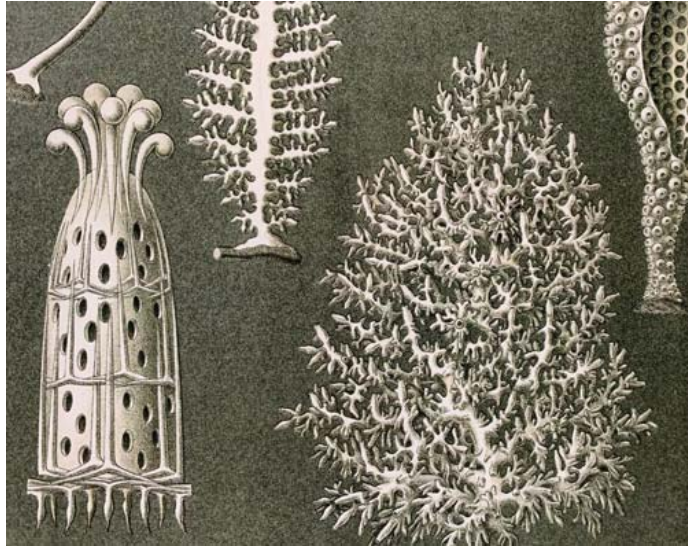
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& | and
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Figure 9. Scanning for distURBANces.

Figure 10. Calcareous sponges as model.
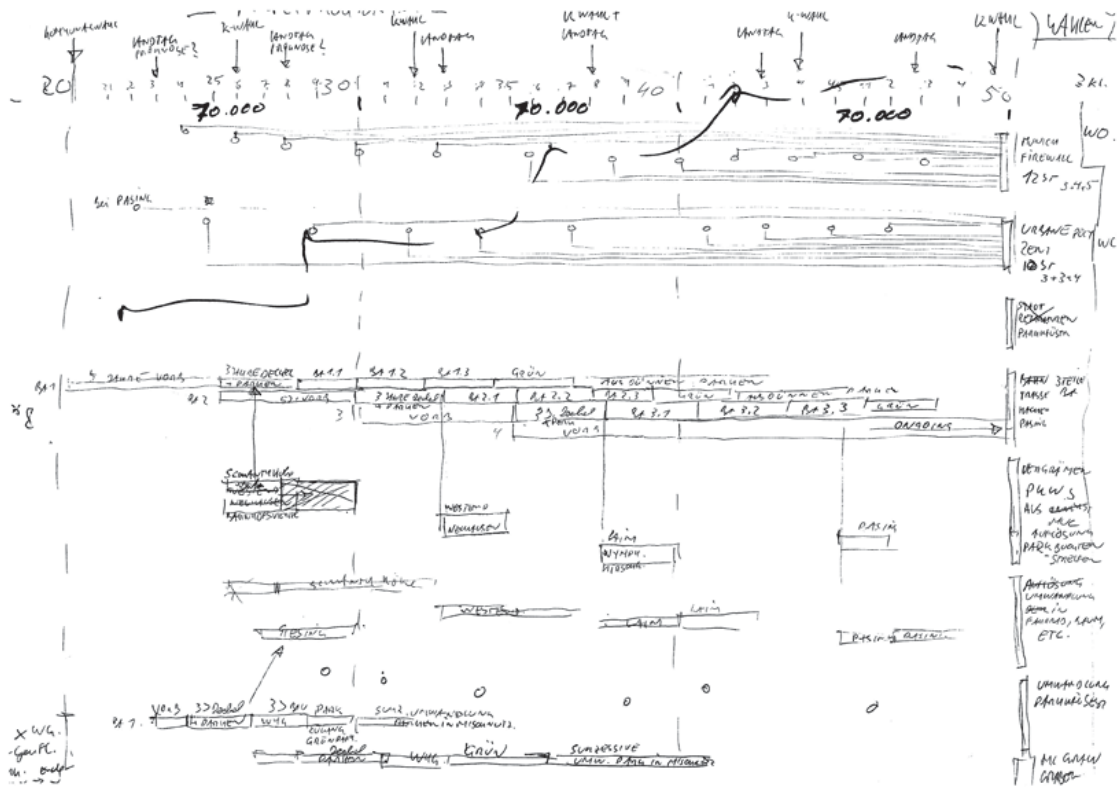
Figure 11. First sketch: the directive for Munich.
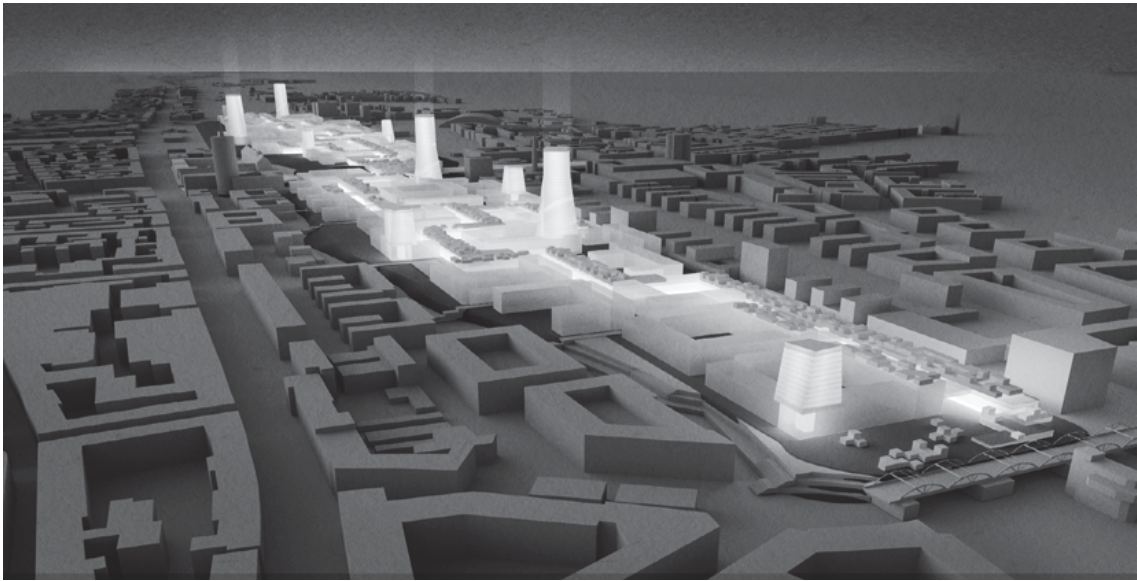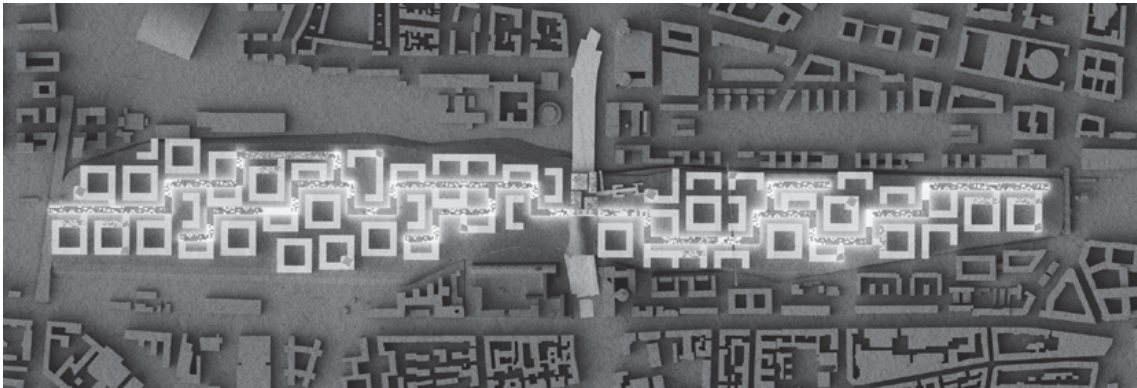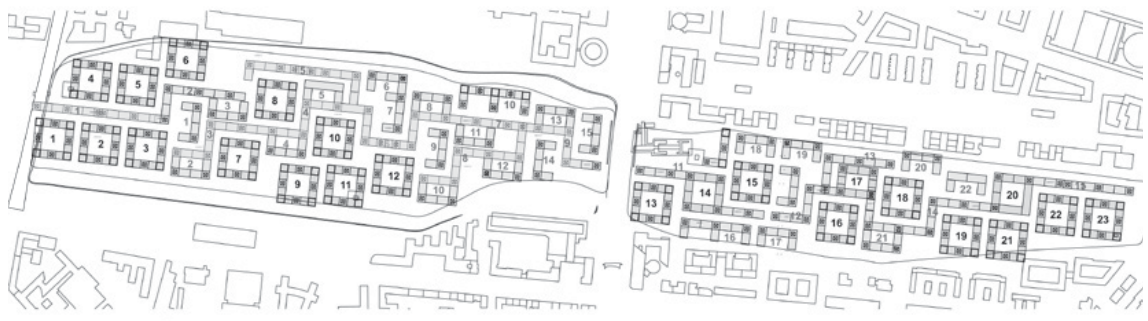
Figure 12. Urban inlay for a global city.

Captions

    Figure 1: No escape for Munich, T. Chutchawanjumrut, Freiheit 2050

    Figure 2: Commuters daily target, T. Chutchawanjumrut and A. Pauli, Freiheit 2050

    Figure 3: Sand in the gears, A. Pauli, Freiheit 2050

    Figure 4: T. Chutchawanjumrut and A. Pauli, Freiheit 2050

    Figure 5: The Munich firewall, M. Stenger et al

    Figure 6: The new network, A. Pauli, Freiheit 2050

    Figure 7: The city of one centre vs. the city of multiple neighbourhoods, A. Pauli, Freiheit 2050

    Figure 8: Calcareous sponges as model, by Ernst Haeckel (from 'Art Forms in Nature')

    Figure 9: Munich distURBANces, A. Pauli, Freiheit 2050

    Figure 10: Scanning for distURBANces, A.P. Nitzsche, M. Stenger, Freiheit 2050

    Figure 11: The Munich script, M. Stenger, Freiheit 2050

    Figure 12: Urban inlay for a global city, V. Kovach, S. Meyer, Freiheit 2050

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Translation

Michael Pilewski, Munich

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Morphological legacies
and
design tools

Read to create and create to design. Urban Morphology as a guide to the transformation process of the 21st century city.

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Keywords: *Urban Design, Urban Morphology, Architecture*

Abstract

The city is subject to constant processes of transformation visible in the design of its tissue and the architect cannot fail to take them into account in the creative act of design. Consequently, it is necessary to identify these processes and their components, which are indispensable tools to achieve the design goal. The elaboration of a new point of view requires us to review our positions towards it. The first step is to examine in more detail the different approaches to the analysis of the urban form, starting from the typo-morphological, linked to the Italian architectural research that belongs to S. Muratori and G. Caniggia, and from the historico-geographical of the English school with M.R.G. Conzen, in particular their logic and their specific objective, to understand if and how they fit together or how they could integrate more actively with each other. It is clear that if the different approaches are studying the same thing - the urban form - and a multiple description provides more insights into a single point of view, we will benefit from understanding the specific relationships between them. It is possible to select the concepts and methods that allow common principles to manifest themselves and avoid unnecessary analogies. The aim is to use a methodology of analysis able to work on the structural substance of an urban organism, on the traces left by the fabric of its formative logic and the way citizens live and transform it. A methodology, able to read and classify the characters and aspects of the urban form as an architectural condition and that always implies, in addition to the historical judgement, also a judgement on the quality of the urban fabric, allows to prefigure, through the project, the possibility to modify its nature in order to better achieve those objectives related to a new perspective of needs imposed by the constant evolution of society.

Reading the processes of transformation of the urban form

Ab ovo, at the origin of the development of the built environment we find a double and reciprocal causality: the physical conditions of a natural environment constitute the inevitable basis of every human settlement and, in turn, the interpretation of the place by the different civilizations forge its history and identity. Human activities, therefore, are the engine that generates the creation of the built environment and they must necessarily be placed in a context of social, economic and political activities. Building a picture of the social and economic context means identifying the values, ideas and intentions typical of the population and resulting from the cultural habits, structures and technology that they generate.

So, thanks to its attention to the process of formation and transformation, the analysis of urban morphology offers the designer a rich understanding of the historical roots and meaning of places. It provides a very relevant view of the urban form and a deeper understanding of the relationships between its different aspects such as shape, land use, control and physical structure.

Today urban morphology is not yet a unified and compact subject of study. Debates on what we might call orthodoxy are not yet dormant. But one of the most important developments of the last two decades has been the importance assumed by two schools of thought of international urban morphology: one linked to the world of Italian architectural research with S. Muratori and G. Caniggia, and the other to that of British geography with M.R.G. Conzen. The mere reading of the theoretical principles that have guided the formulation of the best known approaches, however, is no longer enough and efficient if connected to the constant transformation of urban space and, specifically, requires us to review our positions towards it, in particular in relation to the phenomena responsible for the transformation of the contemporary city. The aim is to identify the elements in common between the two approaches, not as deconstruction and taxonomy, but as an ordering and comparison of existing concepts and methods. It is not an easy task, but as a starting point, it is already encouraging to know that both approaches analyse the unifying aspect of form. Yet, the points of contact and exchange are numerous. Both approaches consider as fundamental the cultural importance of the historical continuity of the urban landscape and its transformation mechanisms; hence the common commitment to a morphogenetic approach to the study of the built environment. Both have identified cycles of temporal mutation and their spatial dimension. Both have observed the weakness of modernism as a cultural project. The city is interpreted as a vital synthesis of a flow of historically identified experiences. At the same time there are differences, for example, that divide their work in Caniggia and Conzen. Although both look at the urban fabric as a whole, the first as an architect has given greater importance to buildings and their formative process; while the second has systematically analysed the city's layout in all its complexity, relegating buildings to their position within the wider spatial configuration of the city. Caniggia formulated a very useful and functional history of the evolution of building types, highlighting their derivations and continuity, while for Conzen building types are differentiated only to define the formal regions and sub-regions within the spatial mosaic of the urban landscape. Examining in more detail the two different approaches to urban morphology, in particular their logic and their specific objective, will allow us to understand if and how they fit together.

The comparative analysis of morphological approaches

The starting point is to identify those key concepts in common that characterize the two approaches to urban morphology. First of all, both consider each form as the result of a process, of the progressive organic association of parts, and it makes sense to break it down and investigate its components only if one considers its substantial unity and indivisibility. There are, in addition to the general basic notion of model, three fundamental concepts that form the common basis of the two morphological approaches to the built environment and are: process, type and hierarchy. The act of constructing is fundamentally a cultural and social process that includes an interaction between individuals or groups and their physical environment.

There is a strong relationship between urban morphology and architecture, this is evident in the construction of a common cultural background around a concept of typology that has always had a strong systematic link with the design of the urban form. Nicola Marzot identifies, in his study on urban form in Italy, a series of different positions based on different conceptions of type. These are mainly due to interpretations of what a contemporary city could be; in turn this has had an influence on the analysis of the urban form.

Some misunderstandings in these positions are based on the interpretation of all types of buildings according to a single language, rather than focusing on historical ones (V. Oliveira 2016). The reproduction of artifacts using the same model or configuration of elements creates a type. To make a distinction, a configuration is an arrangement of parts and a type is a configuration that has a degree of modularity and integration as a cultural habit. The type is a configuration that has been actively reproduced. While each type example may change slightly, the configuration always remains the same. Simple elements have combined together over time to form more complex artifacts: small spaces have created buildings; buildings and fences have created lots; lots and paths have created streets. The result is not a chaotic mass of parts but an appearance of composite artifacts with distinct levels of complexity. The link between the levels forms a compositional hierarchy. In simple form the hierarchy includes: Streets, Plots, Buildings. The combination of streets, lots and buildings, seen as a composite form, is commonly referred to as the urban tissue. It is the main component or unit of urban growth and transformation (Kropf 2017). The elements to be taken into consideration in the morphological analysis form a compositional hierarchy based on the relationships between them.

Karl Kropf, in his "The Handbook of Urban Morphology" suggests a table of a series of elements that allow for a greater resolution of the analysis and includes structure, materials, rooms, buildings, lots, paths, urban blocks, streets, urban fabric. Each element is composed of or contains the previous element in the list. This allows us to read the urban tissue on progressive levels of resolution. The different types of elements can be combined in different ways. The table also helps to distinguish the complementary relationships between the different approaches and the methods that are used for element analysis. For example, the typo-morphological approach treats the hierarchy as a whole as a design context, focusing on the building type level and the urban fabric, while the historico-geographical approach focuses on the transformation cycle of lots and the urban fabric as a geographical structure. Therefore, in the practical act of the morphological investigation there will be two sequences to be used as a guide to reach the objective: to the analysis-comparison-synthesis sequence must be added that description-judgment-design. We know that analysis alone is not enough; we need to compare the results and study them from different points of view in order to reach a better understanding of things and their synthesis. This represents a continuity between "looking" - "reading" and "creating" - "designing". A designer who works with the built environment must see it as a means of design with technical characteristics. Once we understand how it works and why we are attracted to it, we are in a better position to use that knowledge in design and to achieve better results.

The general starting point for the morphological analysis will be to choose the area to analyse, selecting which of the different aspects of the urban form to include. Each aspect will have various levels of resolution according to the chosen architectural scale and will be included in a specific time interval because all morphological studies have a temporal dimension. Once an aspect of the urban form to be analyzed has been taken into consideration, within the comparative model each morphological approach will have its own levels of resolution and historical framework and will be immediately superimposed to the same ones of the other approach, in order to have a comparative analysis framework as complete as possible and able to provide us with the information we need. Identifying consistently defined aspects of form only clears the ground for and facilitates looking in more detail at the individual aspects, comparing them and investigating their interrelationships, associations and correspondences in order to identify the part they play in the processes of formation and transformation of urban form (K.Kropf 2009).

The description of the urban form, read through the different interpretative tools, will be *polytropic[1]*, it will find different types of communication for different types of approach, as in medicine patients are healed with remedies adapted to their conditions and predispositions.

Urban morphology as a prefiguration of the project

The description-judgment-design sequence will allow us to develop a methodology that can read and classify the characters and aspects of the urban form as an architectural condition and that always implies, in addition to the historical judgement, also a judgement on the quality of the urban tissue, and therefore allows us to prefigure, through the project, the possibility of modifying its nature. Kropf also suggests that this system allows us to find and 'free' embedded types, patterns and associations for creative recombination. Through abstraction, for example, it is possible to select the patterns of relationships we find in our perception of the built environment and use them as potential solutions. The generation of innovation and solutions is an ongoing process that is inextricably linked to the cultures that produce them. Any type has roots in the activities and cultural habits that generated it.

"Ex nihilo nihil fit" - most "pure" inventions fail. Working on the structural substance of an urban organism, on the traces left by the tissue of its formative logic, the way citizens live and transform it, reworking or combining different elements that have been tested with continuous use and reproduction is certainly a safer way than starting from scratch. Taking this idea forward suggests that the most significant source of potential solutions for innovation lies in the built environment itself. The built environment is a design resource, a library of tools ideal for new design that matches the continuous transformations of the city and society.
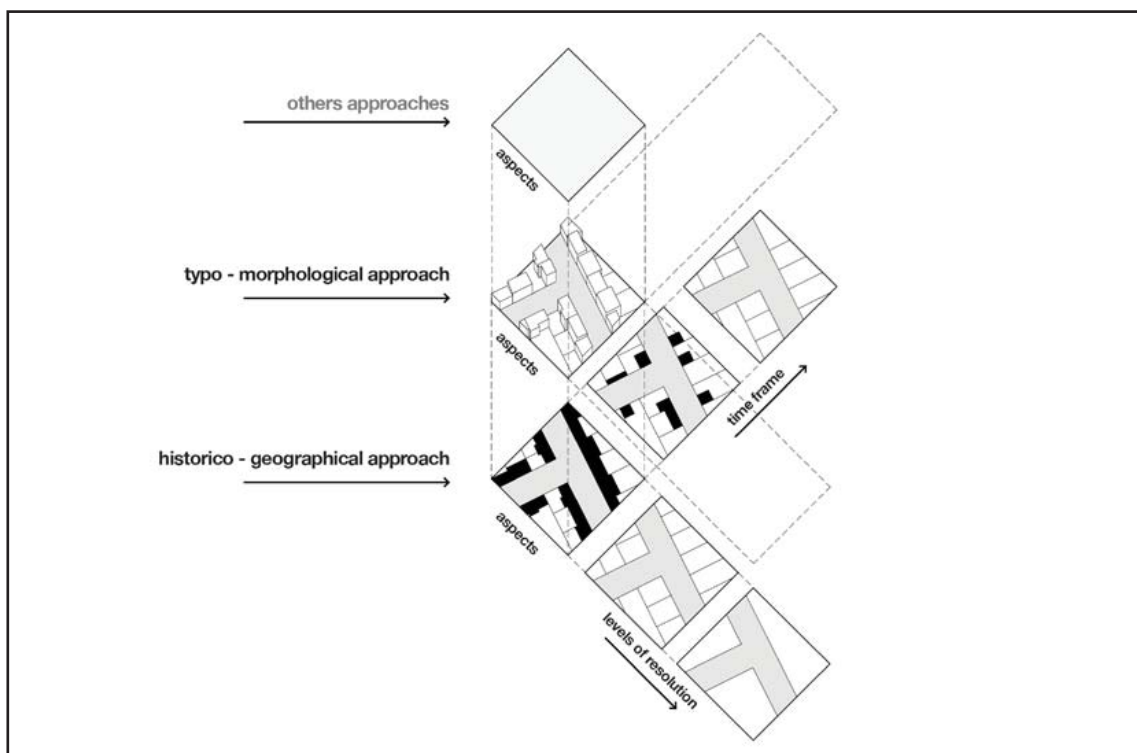

Figure 1. Example of a general comparative model of the analysis.

Footnotes

1 Polytropy: from the greek term polýtropos, the art of finding different types of speech for different types of listeners.

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Integrating Resilience Concept and Urban Morphology. A contradictory merging attempt or a promising combination?

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Abstract

Today cities are particularly vulnerable to any kind of pressures. The increase in urban complexity requires a better understanding of physical urbanization, and parallelly a shift in how cities are linked to environmental dynamics. Tackling the urban complexity requires a socio-ecological system-view where cities appear living and dynamic systems, whose processes and structures are interacting over time at morphological, ecological and socio-cultural levels. These interdependencies can be handled by understanding the extent to which urban forms will be able to resist, adapt to or evolve under pressures and fulfil needs and functions either similar or different from their original ones. However, the explicit introduction of the element of change in the urban morphology field might contrast with the traditional image of built environment linked to order and rigidity. To this regard, resilience concept appears an interesting lens through which reading and understanding the changing urban-world.

The paper explores the combination of urban morphology and co-evolutionary resilience, considering urban form as a key factor in urban resilience. Dealing with some resilient-morphological aspects, the work discusses possible interdependencies between resilience theory and urban morphology and seeks to understand if "resilient urban form" represents a "property" of cities or rather an "end-point".

Introduction

Today there is no doubt to sustain that we live in an urban planet, where built environment surrounds and contains basically everything of what we do. More than 54% of world population currently lives in cities (UNDESA, 2014) and the percentage is projected to reach 67% by 2050 (UNDESA, 2014). This obvious and great acceleration of human footprint on earth in terms of people and activities, especially the most recent ones related to the use of resources, soil and energy, has moved humanity into a new proposed geological era called "Anthropocene", the age of man, characterized by deep influence of human activity on natural processes on Earth (Crutzen, 2002; Steffen et al., 2007; Folke, 2016).

Additionally, the unpredictability of the future cities is also related to environmental degradation, climate change and biodiversity loss, which in turn make them particularly vulnerable to any kind of pressures (Forgaci and Van Timmeren, 2014). Many evidences highlight that if from one side, industrialization and population growth are the main reasons for the increasing urban pressure and risk of economic, technogenic and terrorism crises; on the other, natural-related challenges are leading to the formation of new threats, which are particularly accelerated by climate change (Fischer, 2018). This condition leads also to re-think about guiding concepts as resilience, which is partly a relatively new approach in the urban global debate although a historically relevant principle for cities faced by changes.

Indeed in history, cities have proven to be remarkably resilient complex systems: many towns have existed for thousands of years and have persisted in the face of natural and human-induced disasters to become stronger and in some cases more resilient (Elmqvist et al., 2019). However, the global context of the Anthropocene is changing with a combination of rapidity and magnitude of unprecedented growth which does not allow for a spontaneous laissez-faire of our cities, especially under current environmental and climatic circumstances. Over the last 25-30 years, urban systems all over the world have undergone significant transformations associated with rapid urban migration, urban poverty, informality and resource scarcity, as well as new social, economic, political and environmental changes (Du Plessis et al., 2015). Thus, cities of the 21st century must be resilient to climate and ecosystem changes as well as to socio-economic and political pressures. But are there any physical properties already in place? And which resilient concepts can find translation in urban morphology?

Many scientists see urban form as a major factor in achieving resilience at urban level, being so directly involved in change over time. Strengthening urban resilience, and consequently the evolution and survival of cities, requires understanding how urban form can accommodate change and regeneration through incremental adaptation that leads to transformation of built environment too.

The critical point deepened in this work is to understand how the tensions introduced by the element of slow-change in cities, can be handled through the combination of urban form and co-evolutionary resilience approach (Forgaci and Van Timmeren, 2014; Marcus and Colding, 2014) and through which properties. Indeed, although several studies have recently tried to introduce the element of change in urban form dimension, an explicit morphological understanding of resilience concept related to slow-variables affecting cities is still lacking in scientific research. The paper focuses then on this recent merging attempt and deals with some morphological features which might facilitate resilience at physical level, might provide proper quality levels in the daily urban life, and might become a central task in managing both historical and new cities affected by transformation.

Theory of complexity in the urban framework

The increasing challenges faced by our cities all over the world highlight the fact that they change. In this sense, it is reasonable to argue that past approaches to study cities and urban change are inadequate today, as they base on modernist principles which consider the city as simple, static, ordered, predictable and understandable by breaking it down into basic units. However, as evidences show, this is far from realistic. When adop-

ting a systemic view of the city, Holling and Goldberg (1971) sustain that urban systems are complex in strength of the relationship between their constituting elements. Thus, the focus on one single component and its individual performance does not provide the whole understanding on how the system might react, adapt and transform.

In this perspective, the complexity theory appears the best approach to understand the city as a complicated web of relations between different components of a unified whole (Capra, 1984). The reason of this view is simply related to the growing awareness that the Newtonian "world as machine" cannot work today in cities, where concepts of change, development, evolution and transformation prevail. This holistic understanding of urban contests as complex systems with uncountable interrelationships between objects is helpful to tackle complex phenomena like urban change. In this scenario, the urban system is more specifically considered as a complex adaptive system (CAS) in which several different agents interact with each other in a non-linear, cross-scalar, dynamic manner and follow rules of adaptation (Page, 2011). These systems are in constant state of "becoming", as they never reach a permanent state of equilibrium (de Roo, 2010, 2012).

This recent approach of considering cities as complex and dynamic systems has led to the idea of "socio-ecological systems" where people and nature are interdependent networks (Folke et al., 2010; Davoudi et al., 2013). Socio-ecological systems should not be intended as "social systems plus ecological systems" (Norberg and Cumming, 2008). Instead, they should be viewed as integrated entities, whose processes and structures interact over time at morphological, ecological and socio-cultural levels. In this perspective, the purpose here is to shed some lights in the field of urban morphology and establish which properties of urban forms make cities more connected with the element of change and the increasing urban-challenges happening over a long time period.

Resilient concept in urban contest

Within this contest, resilience has been presented as a useful approach to understand and manage cities and urban-complexity-growth in unpredictable times. Du Plessis (2008) argues that a SES perspective, and by similarities a CAS-one, should be adopted when approaching the study of cities and resilience. This is related to the fact that cities behave as complex adaptive systems, as well as social-ecological ones, performing non-linear, self-organising and diverse networks. This allows us to associate urban form with complex adaptive systems and to read it through the lens of resilience, as an important character of adaptive systems like cities. And to this regard, the evolutionary interpretation of resilience, so called "evolutionary resilience", seems particularly appropriate. Generally, evolutionary resilience can be defined as the capacity of complex socio-ecological systems to change, adapt or transform in face of strains and stresses, rather than facing change with a "return to normality and previous state" (Carpenter et al., 2005; Simmie and Martin, 2010; Davoudi, 2012). Therefore, this ability allows urban systems to survive and thrive in the face of uncertainty, adversity and change, re-defining themselves by innovation (Sharifi, 2018a). The theoretical idea behind is that a resilient system is capable to "bounce forward" to its original state when change occurs, while retaining essentially the same function, structure, identity and feedbacks (Walker et al., 2004). Using the comprehensive model to describe dynamic processes of complex adaptive systems, proposed by Holling and Gunderson (2002) and called "Panarchy Model of Adaptive Cycle", the focus is on the dynamic relationship between adaptability, transformability and stability. This acceptation acknowledges that systems are constantly undergoing change and that there is no one single trajectory to follow nor final status to reach.

However, because of a recent overuse of the term in several polices, international strategies, urban assessments and urban agendas, there is still no mutual consensus on what evolutionary resilience means in urban and practical terms (Davoudi et al., 2012). The combination of resilience and urban form raises the question of "which features of urban form enable or discourage change to take place". This step in central to understand if resilience in space is merely a goal to pursue in the generation of long-term and high-quality spaces, or rather a means for quality of urban space and life inside it.

Merging resilience and urban form

The passages explained until now evidence the need to understand the links between urban morphology and resilience, not only in terms of spatial measures capable to support social-ecological systems but specifically resilient social-ecological systems. However, as previously highlighted, the integration is not immediate as the physical form of cities may be considered un-changeable and rigid. Viewed in that way, resilient urban form might appear an oxymoron. This is related to the traditional image of physical elements as inflexible, rigid and, apparently, in critical contradiction with the major resilience features of flexibility and adaptability.

Nevertheless, when thinking about the city-reaction to different types of shocks, stressors and variables, it is inevitable that design and urban form elements can constantly get transformed, or at least influenced, to enable the urban system to adapt to changing conditions. Sharifi (2019) argues that a "resilient urban form" includes qualities that optimize the capacity of the urban system to continuously maintain proper levels of performance under constantly changing circumstances. This integration defines the degree to which urban systems maintain integrity and functionality, considering the interconnected networks of spatial and socio-ecological systems through different spatial and temporal dynamics, in permanent changing state. To Marcus and Colding (2014), few attempts have been made to link urban sciences to the adaptive renewal cycle proposed by Holling, but it is worth considering them as a relevant voice within this exercise. Indeed, same conditions of non-linearity, discontinuity and thresholds in ecological systems can be applied to urban ones. When considering the city not as a homogeneous structure but rather "a spatial mosaic" (Holling and Goldberg, 1971) it is logical to identify resilient-system properties that may favour (or rather, have already favoured) spatial evolution over time. Moreover, analysis of living and evolving cities highlights evident "forces" mainly derived from historical layering over millennia, which follow long-range time order, spontaneity and correlations that allow both change and diversity in the urban system (Salat et al., 2014).

View in that way, the concepts here introduced in urban morphology refer not only to the form of human settlements, but also to the process of their formation and transformation over time (Chen, 2014; Pajouh and Alipouri, 2019). Thus, urban form can be seen as the spatial representation of a complex and dynamic combination of interactions between multiple social, economic, geographical, cultural, physical and technological factors that play a defining role in the dimensions of materials and immaterial. One may state that urban form and morphology base on a double level of analysis: the spatial level and the systemic level, which is less perceptible than the first but indeed very dynamic and active. As a consequence, steps in recognizing the dynamics of urban morphology can be central to understand design properties and their role in enhancing the resilience of such a complex system. However, as previously explained, resilience of urban form is influenced by so many tempo-spatial dynamics occurring among different scales and elements. Therefore, it becomes important for this work to set some theoretical boundaries among the following key questions: "resilient urban forms to what?" and "resilient urban forms for what purpose?".

This clarification makes the merging attempt of "resilience theory" (Holling, and Gunderson, 2002; Davoudi et al., 2012; Folke, 2016) and "spatial morphology" more research-oriented and tangible. Unquestionably, it represents an important step in the emerging field of translating resilience theories into variables of spatial forms, and in making the findings informative and supportive in spatial planning theory. Hence, before identifying some morphological properties of resilience, it is essential to clearly address the above inputs.

Resilience to what? Resilient urban forms in face of which disturbs?

As evident from the previous sections, evolutionary resilience is a growing discourse under the wider urban-sustainability umbrella, which undertakes that resilient principles constitute a promising theoretical "toolbox" to understand complex-adaptive systems and enhance quality of life in cities (Marcus and Colding, 2014; Samuelsson et al., 2019).

However, in this complicated-contest it is necessary to focus on some specific stressors and discount others, as it becomes clear that being resilient to everything is a challenging task. In line with Davoudi et al. (2012), the definition of a system's boundary inevitably focuses on some things and discount others. Parallelly, we believe that within the spatial field, considering the general type of resilience (Walker & Salt, 2012) risk to create a contrast between methods to face disturbs and stressors, and thus to produce very different resilient properties of urban form not related to each other. Consequently, this bounded approach leads to the choice of focusing on slow variables affecting cities, rather than abrupt changes. This means to exclude from the analysis, for instance, several sudden variations like climatic shocks, natural extreme events, man-made disasters and so on. Furthermore, this implies to avoid "resilient design strategies and solutions" sometimes already in place at building and neighbourhood level where purely engineering and technological solutions, albeit effective and performative, concur in enhancing resilience.

On the contrary, slow variables do not follow a fixed timescale, but their movement underlies the system horizontally and for undefined-long term. They might relate to both man-made and natural movements affecting cities as, respectively, urbanization (which implies more housing, services, infrastructures, etc., for more people) and natural phenomenon as sea level rise, erosion, … (which increase the conflict between city and nature, recently also accelerated by climate change). Because of their slow and external-driven nature, they can somehow be considered "controllable" and then closer to the reorganization of system-dynamics (Walker et al., 2012). The spatial operationalization of these processes has an immediate link also with the second question, which aims to define the system functions to be strengthened when translating the resilience paradigm.

Resilience for what? In the purpose of which function (s)?

Adopting the co-evolutionary approach of resilience to urban form has an influence also on system purposes. Indeed, rather than viewing slow and inevitable variables as problematic, the built-environment affected adapts and constantly reinvents to innovate the system while maintaining basic functions and structures (Holling, 1987, 2001; Davoudi et al., 2012). In this discourse, it is central also to understand how different urban form features may pursue distinctive resilience levels. Therefore, when identifying the functions for which the urban form should be resilient for, we assume that the prime goal is to ensure the quality of the urban environment in the day-to-day life. In this sense, the urban system addresses directly to those properties which may spatially facilitate citizens-life, not just for survival, but mainly to create a tangible and intangible sense of place (Ståhle et al., 2005), identity and healthy. This introduces an approach to urban form that through the material dimension crystallizes and represents history, culture and transformation processes and, over time, builds up the sense of place, community and security which contribute positively to the quality of life in cities (Chen, 2014).

Resilient properties of urban form

Once clarified the resilience-interpretation here adopted, the paper turns to its spatial translation as a layered concept consisting of some spatial features capable to consider the key characters of slow-variables and quality of the urban environment in the day-to-day life. In the following paragraphs then, resilience of urban forms is explained through some space-based attributes linkable to co-evolutionary theory of resilience selected from an updated literature review over 30 attributes related to resilience across different scales and facing different pressures. Since the selection-process is still ongoing and the current analysis does not pretend to identify all the spatial components of the bounded framework described, in this phase the scale-issue is taken into account but without focusing on a specific spatial level. When recognizing the complex and nested network of hierarchical scales characterizing urban systems, it is evident that each scale might have its own resilient-spatial properties. However, these issues need further investigation and more detailed analysis. Thus, this study maintains a comprehensive perspective where the spatial features provided can be linked to a general level of urban form.

Starting then from a broader collection and from the purpose of this study, the resilient

form of cities is explored with eight properties, considered as the most appropriate "translators" to introduce resilience in urban form, while remaining in the overmentioned boundaries. Table 1 provides an overview of these properties and a brief explanation of each.

Table 1 - Resilient properties for Urban Form (Source: Author's elaboration from literature review, 2020)

Resilient Properties of Urban Morphology	Description
Redundancy	In the urban-changing contest, redundancy allows systems to continue to function when subsystems fail. If one part collapses, another one can take its place while performing the same functions (Fleischhauer, 2008). To Feliciotti et al. (2018), redundancy is the disposal of multiple components or pathways, which provide an insurance mechanism for anticipating change, damage or failure. A redundant system shows high availability of substitutes and thus lower likelihood to stall in case of failure (Anderies, 2014). Therefore, redundancy is a structural property of the urban form autonomous from any specific future scenario (Lhomme et al., 2013), which can help the survival of the system and its effective functioning, when both unexpected shocks and slow variations occur.
Modularity and Reproducibility	Following the theory of redundancy, "modules" favour the distribution of functions or services in a system, so that their localization is spread across decentralized sub-systems (Ahern, 2011). It seems that they work in parallel: internally, modules are joint by robust close-range internal connections while externally, they are tied by relatively weak long-range connections (Salingaros, 2000). Thus, modularity provides a system with different functional modules that can evolve and reproduce somewhat independently without affecting the others and can promote transformation and adaptation to slow changes (partly as to unexpected ones). Modularity enables basic functions and structures to aggregate and to form new higher scale combinations while maintaining their individual identity (Salingaros, 2000). In the contest of resilient urban form, modularity affects interaction between urban elements and across different scales.
Efficiency of scale-systems at scale-level	Applying the concept of efficiency in resilience, even if mentioned in literature, is controversial. Several authors claim that efficiency is achieved at the expenses of other properties as diversity (Anderies, 2014), connectivity, redundancy and modularity (Novotny et al., 2010), in a way that decreases overall resilience and simplifies problems through processes-optimization.

	However, in complex systems theory, efficiency does not imply a process of simplification but, on the contrary, it requires an increase in structural complexity at every scale (Salat and Bourdic, 2012). According to Feliciotti et al. (2016), in the urban form field, efficiency relates to the hierarchic organization of different urban elements and needs that, at all scales, the same level of complexity is guaranteed.
Diversity in agents	Even though diversity is sometimes used as a synonym of "mixed land uses", they are actually quite different in terms of spatial morphology. Indeed, diversity is "a multidimensional phenomenon" (Turner et al., 2001) that encourages further desirable urban properties, including more variety of housing types, household sizes, building densities, community - ages, cultures, and incomes (Jabareen, 2006). On the contrary, "mixed-land-use" indicates the variety of functional land uses as residential, industrial, agricultural, commercial, and so on, and is thus mainly related to the zoning activity of urban planning.

Therefore, it is evident that diversity represents the social and cultural context of the urban form. In this sense, we must also recognize that beyond the general knowledge about city performance and zoning activity, there are specific factors which make each place unique. It has also strong connections with the creation of multiple spaces and places (Ståhle et al., 2005; Marcus and Colding, 2011), which can favour and develop new levels of urban-settings, characters and identities. In Samuelsson et al. (2019), diversity is a conditioning attribute to build resilience in systems characterized by complexity. |
| Flexibility and adaptability of urban structure | New urban conditions faced by "slow-phenomena" related to climate change are very likely to cause more unstable conditions in many cities of the world and with different direct impacts. This means that several components of urban morphology as housing, vegetation and land need to be designed with progressive attention for slow changing circumstances as increased water flows, thermal conditions (indoor and outdoor), harsh winds, and so on. These pressures, taken together with future growths in population, lead to the need for cities to withstand change of forms and functions. Practically speaking, it is, for example, a matter of ground floors of buildings and of higher floors high enough to enable different types of use and functions. A small-scale property classification and diversity of buildings creates a mix of uses and technical solutions which provide the conditions for |

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	flexibility of space over time as well as for good levels of urban-life (Stangl, 2018). Additionally, when linking this property to the spatial dimension of many layered cities, it can represent an opportunity for the most affected areas to add new quality, becoming more complex and creative (Salat et al., 2014).
Density	Density is a dominant feature in both sustainable and resilient discussions on urban forms. Generally, it refers to the ratio of people, dwelling units, bed unites or habitable rooms to land area (hectare). Density and dwelling type affect urban sustainability through different levels of energy consumption, materials, land for housing, transportation, and urban infrastructure (Walker and Rees, 1997). To IPCC 2014, urban density affects GHG emissions however, it can be considered as a necessary but not sufficient condition for low-carbon cities (Revi et al, 2014). In UN-Habitat perspective, working on urban density means to intensify the density of existing built-up areas through infill development and setting growth limits (UNDESA, 2014). Following our resilience perspective, density deals with urban issues affecting the built environment. Indeed, making density a key-variable of resilient space leads to estimate realistic land requirements over a 30-year period and to encourage social interaction. Working on density then means to develop two parallel paths: non-physical processes and functions in place, and connected spatial patterns.
Compactness and Proximity of functions	In tight relation with density, compactness refers to urban contiguity (and connectivity). Sharifi (2019) indicates compactness as an indicator related to the clustering degree and capable to understand if a city follows monocentric, polycentric or other patterns. In the light of future urban development, this property should be developed adjacent to existing urban structures (Wheeler, 2004). Parallelly, when referring to existing urban fabric, the concept is linked also to the containment of further sprawl and not only to the reduction of the already present one (Hagan, 2000). Thus, the feature can enhance proximity, synergy and effectiveness of functions, improving the quality of urban space. Additionally, indicators based on clustering as compactness are directly linked to other popular urban forms, such as centrality and accessibility, which can be developed in future steps of this research.

Connectivity	In Feliciotti et al.'s perspective (2016), connectivity represents the "ease of flow" within a system and across systems. However, when introducing this physical property in resilience discourse, there is no a uniform interpretation: on one side, with high connectivity both knowledge diffusion and recovery after pressure are favoured in urban contests; while on the other, with low connectivity disturbs-expansion is contained and thus the conservation of "pockets of memory" at physical level is enhanced (Marcus and Colding, 2014). At spatial level, there is a need to balance over-connection and fragmentation within forms and, even more required, it is important to understand if connectivity is able to guarantee resilience in response to specific disturbs (Resilient to what?).

Discussion

The overmentioned outline is far from complete, neither can be considered definitive. However, it provides an overview of the key morphological features that, in response to specific questions (Resilience of what? And for what?), may translate resilience into spatial level. This means also that, rather than an end-point, resilience can be referred to as a context-sensitive property of urban form, whose characteristics may vary according to several factors linked to tempo-spatial dynamics, risk to face (R to what?) and purpose(s) to achieve (R for what?) (Sharifi, 2018). Indeed, as previously clarified, in urban complex systems there are several levels which operate across multiple scales. Consequently, these resilient spatial characters can be recognized also depending on the scale of investigation and on the organization of spatial elements.

Following the idea to maintain a comprehensive categorization to read the urban structure, a visual metaphor is here proposed. In relation to the previous features, it seems that a red thread connects them all. This common line is represented with the image of a leaf which can enhance the capacity of urban complex systems to adapt and transform to changes (Salat and Bourdic, 2012), (Figure 1). Indeed, there is reason to state that representing the city structure as a leaf is an interesting method to translate resilience concept at spatial level. In morphological terms, leaves are totally connected among intermediary scales, from the highest branches to the finest capillaries. Furthermore, their structure presents high degrees of complexity on all scale-levels, resembling then to many other complex-systems as living organisms, ecosystems, economic systems, and so on. The leaf-system of veins, connections to one another, repetition of connections and distributions, makes the urban structure much stronger for facing slow variables and for reorganizing basic functions.

The overmentioned properties of resilient urban forms are connected with the leaf structure also because features like hierarchy of scales, redundancy and modularity are present in leaves, in parallel with flexibility of space and functions, levels of diversity and self-organization.

Figure 1. Representing a city as a leaf (Source: Authors elaboration, 2020)

A deeper focus on the leaf structure can for instance demonstrate that within its series of connections and densities, there is a certain intensity and redundancy that can influence the system-reaction to change. Physical properties of a city (and of a leaf too) can for instance prevent dangerous fluctuations from spreading quickly through the system, dissembling it and enabling transformative capacity. Rather than a tree, many cities resemble mainly to a leaf also because within this structure, variables-flows are managed more organically and spontaneously than in a tree structure, where efficient distribution tends to allocate stationary flows through main branches, in the most efficient way. On the contrary, the leaf-model guarantees that if a vein is interrupted or compromised, the redundancy of the system will allow the flow to get around the obstacle via secondary paths, so to keep on reproduction and evolution, while maintaining basic functions and structures.

Recognizing that a more detailed explanation about the functioning of a leaf-city and of each property can be analysed at deeper scale-level, it should be noted that the whole resilient framework presented for morphology is also able to respond to the two overmentioned questions. Broadly speaking, in "Resilience to what?", the eight urban form measures may improve resilience in response to slow variables. For instance, redundancy may provide multiple socio-economic and environmental components which favour a mechanism for anticipating slow change, possible damage or thresholds. As a structural component, redundancy ensures the survival of the system and contributes to maintain the effective functioning of life-quality elements. Density is another urban characteristic frequently mentioned as it favours adaptation and transformation of built-environment, through realistic estimations of land requirement over a long-time period. Turning then to the question of "Resilience for what?", the selected properties are capable to generate form-configurations addressing quality of daily-life in the city. In this sense, diversity may develop functional options addressing spatial evolution through time. Indeed, the formation of multiple spaces can favour the production and reproduction of social and spatial situations, ensuring the city's quality (Berkes et al., 2003; Marcus and Colding, 2011). Reproducibility and modularity as well make a system more resilient, promoting spatial-independent evolution of functions, persistence and adaptability.

Conclusion

In this paper, we present a description focused on the physical dimension of urban space as an element of a more complex system. The properties above are far from exhaustive, but this aspect is not a weakness of the work but rather a broader opportunity to examine more in the future steps. Three main comments may close this investigation.

Firstly, the overmentioned features open the possibility to spatially recognize resilience in urban built environment, linking these elements to design dimension. This is a crucial step because it enables the critical passage of resilience from theory to practices, highlighting the need to progressively connect science and practice.

Secondly, the generic approach adopted to describe resilient-spatial properties favours its easy application to different spatial scales. This means that the characteristics identified can be translated in different levels of urban systems, passing for instance from the whole city-scale to the neighbourhood-one.

And thirdly, the properties remind that despite urban form is the most concrete dimension of cities, as Marcus and Colding state, "it does not exist in isolation" (2011). Indeed, morphology exists within a more complex network of tangible and intangible elements which have developed through time and have made that place "typical of something". This aspect makes the property-selection particularly delicate and more challenging than other urban dimensions.

Therefore, further research is needed to deepen these aspects and better explore how resilience can be recognized as an underlying property of space. Recognizing resilience as an urban-design aspect can definitely get out from umbrella-discourses on resilience, by firstly distinguishing end-points from means of urban transformation-processes. Additionally, translating resilience in practical terms of morphology can also lead to discern it from sustainability concept, which has created several overlaps and misunder-

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standings in the discussion for a long time.

Thus, there is reason to believe that these steps can represent a contribution in the urban morphology field, especially under the current scenarios of increasing uncertainty. Furthermore, introducing theories of resilience in urban-form-understanding might facilitate the regeneration of some contests affected by change. Finally, these resilient morphological elements prove that integrating Resilience Concept and Urban Morphology is far from contradictory: the combination is promising, especially for those cities experiencing extensive processes of transformation.

Illustrations and tables

Table 1 - Resilient properties for Urban Form (Source: Author's elaboration from literature review, 2020)

Fig.1 - Representing a city as a leaf (Source: Authors elaboration, 2020)

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On methods.
Towards an operative reading of city morphological legacies ordinary-building and building-type

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Abstract

The paper addresses an operative reading of the city to decode the Portuguese city form and explores the transfer of its principles to urban design process. The research objective is to learn from the past and establish an analogous relationship between reading and designing the city. Starting from the topic of the urban fabric composition, particularly in regard to the reading of "samples", i.e. urban fragments with urban elements serial repeated, the aim is to deduce the laws or design principles behind the shape of historical cities.

Methodologically, the proposed approach is based in a form of dialectics attempting to bridge a conceptual relation between the urban fabrics produced throughout the time with the conjectural process of its design. Using drawing as an interpretation tool, together with delayering and elementarism as methodological procedures of decomposition, allowed for the exercise of progressive abstraction and consequent simplification of the complexity of the urban form. The purpose is understanding the whole through the knowledge of its components. From the conjectural point of view, we reconstituted the code of design principles based on a theoretical frame which defines the built typologies structural interference within the city built-fabric.

With the comparation of some paradigmatic case studies from the Portuguese urban fabric it is explored an operative reading of the city according the role of the building typologies as element of urban composition. In addition, this methodology proposes an interference between the analytical procedure and the design approach, both urban and architectural. It means that operative reading should be understood as a transfer from the built-city and from the history to establish an analogous relationship between the interpretative reading and designing of the city.

It has been said scientific discoveries consists in seeing analogies where everybody else see just bare facts.
Oswald Mathias Ungers

1. Towards an operative reading of the city

The paper addresses a method of reading of the city to decode the Portuguese city form and explores the transfer of its principles to urban design process. The research objective is to learn from the built city and from the legacies of the past and, on the other hand, with the possibility to explore the analogies between the reading process and the design behind the form of the built city. The study of the relationship between the building typologies and the urban form aims to explain how the buildings can play an urban role in the design process of the city.

If we understand the built city form as a repository of knowledge, the urban layout or the analytical stratum of the public space is where concentrated the essential characteristics of the city, both the identity of its shape and the timelessness matrices that support its evolution. In this sense, the urban layout can be understood as a powerful element of analysis. It is a structural element of the urban form because it connects the territory and its form with an idea of order or space organization, attach the plot pattern with the building typologies and, more than that, the urban layout give a nexus to link the public and the private components of the urban fabric.

From the conjectural point of view, we reconstituted the code of design principles based on a theoretical frame which defines the built typologies structural interference within the city built-fabric. With the comparison of some paradigmatic case studies from the Portuguese urban fabric it is explored an operative reading of the city according the role of the building typologies as element of urban composition.

In addition, this methodology proposes an interference between the analytical procedure and the design approach, both urban and architectural. It means that operative reading should be understood as a transfer from the built-city and from the history to establish an analogous relationship between the interpretative reading and designing of the city.

2. On methodology: elementary decomposition and delayering

Starting from the topic of the urban fabric composition, particularly in regard to the reading of "samples", i.e. urban fragments with urban elements serial repeated, the aim is to deduce the laws or design principles behind the shape of historical cities.

Methodologically, the proposed approach is based in a form of dialectics attempting to bridge a conceptual relation between the urban fabrics produced throughout the time with the conjectural process of its design. Using drawing as an interpretation tool, together with delayering and elementarism as methodological procedures of decomposition, allowed for the exercise of progressive abstraction and consequent simplification of the complexity of the urban form. The purpose is understanding the whole through the knowledge of its components.

In a broad sense the reading process of the urban fabric is based in a theoretical exercise of deconstruction of the built reality, where segmentation means division the city by parts and decomposition means delayering of systems and identification of elements within the urban fabric.

The book of O. M. Ungers about "city metaphors" is one important theoretical reference to understand the city as a complex system made by systems. The comparison of Manhattan "street structure" with the "bone structure" of a human body and also with a "frame structure" of a car brought to the definition of city a powerful analogy with a very clear meaning, where the city is represented as something in-between the organism and the machine, an entity a half organic and a half mechanic (Ungers, 1982).

Besides that, the fragments that represents the pediment of the Greek temple of Aphaia on Aegina, which we can find in München Glyptothek, give us the notion that an element can be seen as a fragment or even as a member that represent part of an entire body. In this current exhibition of Aphaia pediment we understand the shape of

the object only through the recognition of its fragments.

Furthermore, if we remind of Ernesto Nathan Rogers and his quotes that said that the "Element, is the part that contains everything of which it is part" (Rogers, 1981). When we look at a city as Lisbon through a set of samples of the urban layout, we acknowledge through its elements the shape of the city in a similar way as we do with the fragments to recognize the pediment of Aphaia temple. In fact, urban samples, hide much of Lisbon's urban complexity. But, that is why it gives us a clear idea of the homogeneous parts that compose Lisbon urban fabric, and also the idea of the city as body made by different members.

In methodological terms to the reading of the city layout, it is necessary to acknowledge the homogenous parts that compose the shape of the city. For this, it is needed to identify within the city the limits in which we can find a coherent and consolidated urban form. This task follows the steeps of M.R.G. Conzen and its theory on morphological regions (Conzen, 1960) but also the notion of neighborhood established by Kevin Lynch on the classic book about the Image of the City (Lynch, 1960).

In this sense and regarding the built city as a case study, the analysis proposes the theoretical deconstruction of the urban fabric and the decomposition of the urban layout into a set of parts, which are homogeneous urban layouts or urban fragments composed by similar urban elements.

Each recognized homogeneous urban layout has its own structure. The delayering of each one shows a set of morphological strata, namely the limit, the theoretical grid and also an internal structure.

The small town of Caminha, in the north of Portugal, is here a clear example of where the medieval wall defines the limit of the urban layout. And where the conceptual reference is the Rua Direita, i.e. the Portuguese straight street that defines a linear system of public spaces that structure and hierarchies the grid or the regular matrix.

As noted, when we focus on analyzing the shape of Lisbon by reading the samples of urban layout, we hide the structure of the city urban shape and mainly its complexity, according the specificities of each context and the formal composition of each neighborhood. (Figure - 1)

Thus, regarding the samples as an abstract fragment of fabric, we carefully observe the ordinary elements of the urban composition that allow us to find the elements type of the urban form namely: streets, intersections and urban-blocks.

The urban decode and interpretation of the Baixa neighborhood sample, in Lisbon, is based on decomposition by gradual simplification of the urban fabric (Figure - 2). By decomposing the urban sample, it is possible to obtain an explanation of the built city, but, more than that, it provides a theoretical model of the city making that is behind its design process. Through methodical decomposition we turn more simpler the identification of the ordinary elements and, by simplification we become evident the elements of composition behind the design urban form.

Regarding the urban-block type previous identified in Baixa urban fabric, its floor-type plan is characterized by buildings with a similar typology. However, the different dimension of each plot and the variety of the buildings is characterized by the modularity of the theoretical grid of composition (Figure - 3). The grid is here a powerful element of composition that codifies the regularity, but also the variety of the plots and buildings.

The representative building that we can find in Baixa, or on the other words its ordinary building has the ground-floor for commercial use, strict connected with the public space of the street, and a floor-type plan characterized by a sequence of modular rooms and a structure of spaces that allow the flexibility of use for different housing programs (Figure - 4). The building typology in Baixa varies according dimension and position. The dimension in terms of footprint vary according the width of the buildings, which depends on the number of windows. Each building has around 12m deep which means the increase of area vary according the width of the building façade. On the other hand, the position of the building varies within the urban-block, facing the street in a regular position or in the corner which defines the streets intersection.

3. Building typologies and city composition

Taking Lisbon as case study, in the process of analysis we can ask the role of the buildings within the design process of the city, or even in the urban fabric itself.

According to the theory of Gianfranco Caniggia we can divide the building typologies in two main groups, i.e. "edilizia speciale" or the specialized buildings and the "edilizia di base" or the basic buildings. The concept of singular building finds its root closer to the idea of edilizia speciale. It can be widely understood as a building with an important public role as those typologies we can find when looking closer to the city center of Lisbon. They are public typologies that structure the urban layout according the public system of the city (Figure - 1).

The typical urban fabric of Rua do Almada, in Oporto, is very characterized by an ordinary building, which was a 18th century re-interpretation of the row-house. In this urban fabric, it is the "common building" or the repeated use of the same typology as the "Edilizia di base" that rules the design, both urban and architectural, as an integral composition.

This building type has a ground floor for workshops and warehouses and the upper floors held housing programs according a narrow plot with around 5m width.

In this fabric the buildings are serial repeated and aggregated in straight line and the building type can even be understood as the generator of the urban form. On the other words the urban fabric results from these unity between street and buildings. It is the building-type who define the public space of the street, mainly the street section. The width of the street, which is twice of the width of the building, and its height that is leveled by the façade of the building. Also, the façade of the street is ruled by the serial repetition of the building type.

The reading of urban fabric in Malagueira shows the use of building typologies combined mainly with a modular urban block and not so much with the design of the street.

Malagueira is a housing program, designed in 1977 by Álvaro Siza Veira in the outskirts of the old city of Évora. The urban layout is conceptually supported in an ordered grid system, where the regular plot pattern is the key to understand the shape of the streets and also the fabric itself as a volumetric and spatial entity.

In Malagueira, the modularity of the plots is strongly related with the typology of buildings, which are an evolutive typology of courtyard houses that produces volumetric varieties in the urban-blocks based in a few differences of buildings types. The building type is aggregated according to a modular urban-block, with a similiar composition principles that is also used in the neighborhood of Baixa, in Lisbon. However, the built fabric is less flexible than in Baixa because the root of the buildings, i.e. the plots, are equal in terms of area and shape.

The Bela Vista neighborhood is a project designed in 1975 by José Charters Monteiro and Aldo Rossi. The design behind this housing program proposed to Setúbal expansion area is conceptually rooted in the idea of continuous built fabric where the floor-type is the result of an aggregation of two types of dwellings, serial repeated according the use of a gallery for circulation and to give access to the houses, and also in a set of principles to design the image of the street façade.

In Bela Vista the urban form is in a broad sense the result of the combinations of four main systems that follow the traditional idea of street but reinterpreted. One of these systems is the (1) grid, which defines the hierarchization of composition axis and mainly support the design of the streets in articulation with the pedestrian passages and galleries. The (2) urban layout is here related with the design of the public ground, specially composed by streets and urban patios. The (3) street-façade, which design according a street image results from a nexus for the aggregation of (4) cellular dwellings type.•

Nevertheless, the urban fabric can be also the result of the design with parameters of form and not only with the spatial definition of the final form of urban fabric. In this sense, the specialized urban fabric of the university campus of Aveiro, design by Nuno Portas in 1986, plays an important role as example. The design principles behind this urban fabric are based on a volumetric definition of the buildings, which uses typological parameters of form in order to relate the plots to the building's footprint and also the height of each

college, placed around a wide arcaded square.

Here the urban layout has the role to define the public ground and the support of the urban composition mainly centered in a contemporary reinterpretation of a cloister with urban character.

4. Manifesto towards a *Città Analoga*

The comparation of some paradigmatic case studies of the Portuguese urban fabric allowed exploring an operative reading of the city, according the role of the building typologies as element of urban composition. In addition, the methodology proposes an interference between the analytical procedure and the design approach, both urban and architectural. It means that operative reading should be understood as a transfer from the built-city and from the legacies of history to establish an analogous relationship between the interpretative reading and designing of the city.

From these considerations it is possible to admit that the knowledge extracted from reading the existing city may be transferred to the development of new concepts, as well as to the creation of new urban realities or even to design the urban fabric, whereby it may inform a position on the way of thinking the production of the form of the city.

In this sense, the Aldo Rossi's manifesto in 1976, towards a "Città Analoga", still seems actual today. Legacies from the past mean, more than ever, collecting references from the past to imagine a parallel reality in the future. According that, we must remember the undercover message behind the Rossi's collage, an idea of future and modernity must be rooted in the idea of continuity.

Figure 1. Lisbon, singular buildings.

Baixa, Lisbon

urban-block type and [3] streets type . theoretical model   conjectural grid   grid   urban layout
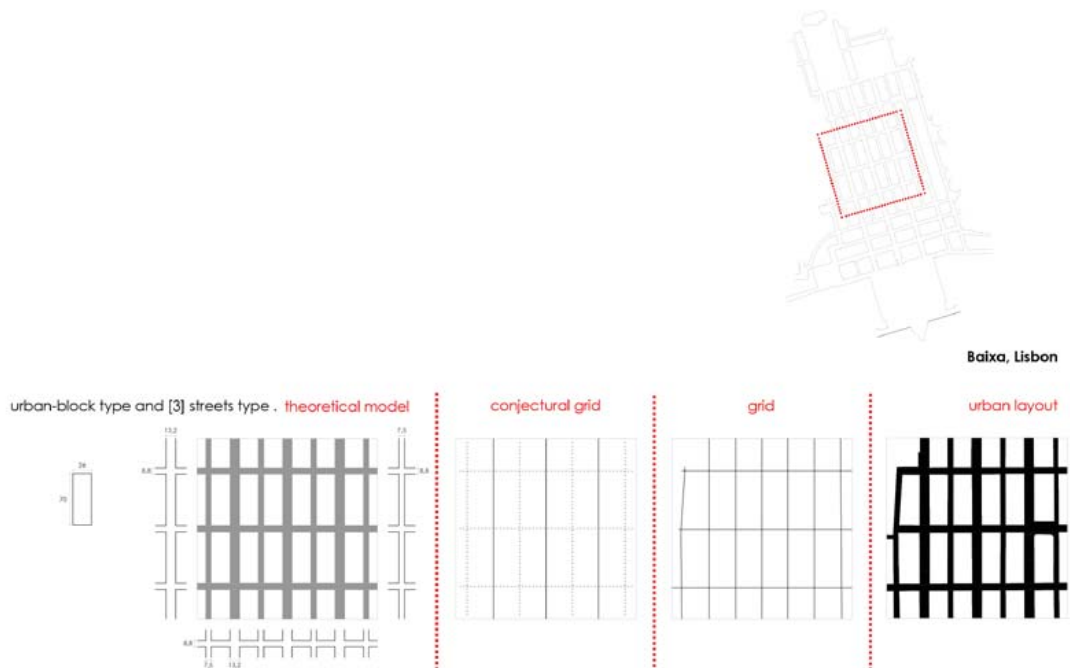
Figure 2. Decode of Baixa sample.

façade
[design project]

grid
[theoretical model]

façade

Baixa urban-block

plots

urban-block floor-type
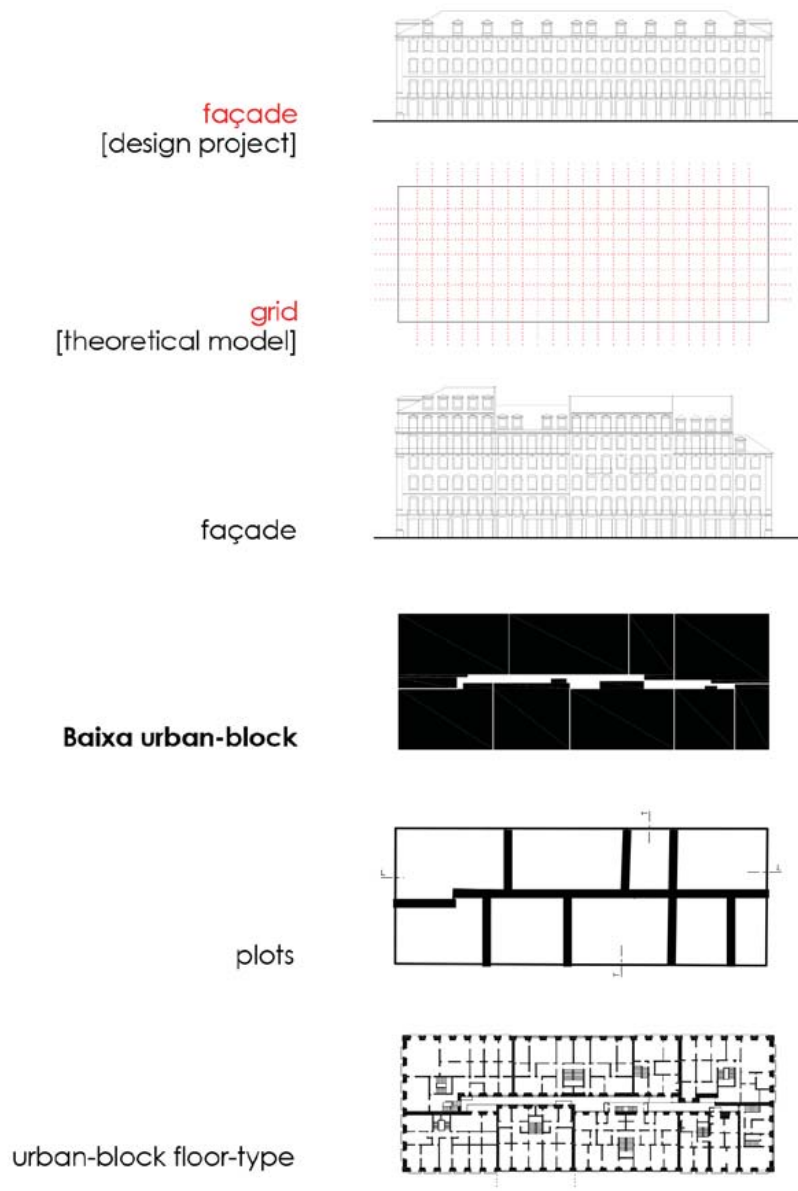
Figure 3. Baixa, urban-block.

Figure 4. Baixa, building type.

Footnotes

[1]Ungers, O. M. (1982) Morphologie: City Metaphors (Köln: Walther König), p. 4

[2] The paper is part of the ongoing research project "Building Typology – morphological inventory of the Portuguese city, funded by FCT ref. PTDC/ART-DAQ/30110/2017.

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Designing for Productive Urban Landscapes.
Applying the CPUL concept in Lisbon Metropolitan Area

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Abstract

Designing for urban agriculture has been recently acknowledged as a young discipline requiring the attention of architects, urban designers and planners to promote more sustainable urban cities and continuous productive landscapes. However, how to assess such landscape proposals? How can these be evaluated in terms of their social, ecological and spatial dimensions?

Based on the Continuous Productive Urban Landscape (CPUL) tool proposed by Bohn and Viljoen (2005) this presentation exposes a framework for action which could be applied in Lisbon Metropolitan Area (LMA) in order to evaluate the spatiality of its contemporary food system and promote design solutions to improve it.

In order to do so, this paper is organized in three parts. First, it introduces the problematic under analysis and the case study. Secondly, it exposes how an analysis of the urban agriculture, more precisely along Lisbon - Vila Franca de Xira axis, contributed to expand our understanding of the productive dimension of LMA Food System and interrelates it to a morphological perspective. Finally, it introduces the CPUL concept and a possible application of it within the case study, with impact at the several stages of food system.

Introduction

SPLACH - Spatial Planning for Change research project aims at preparing a body of transformative planning policies, implementation mechanisms, and decision support systems, to guide Portuguese planning practice towards a transition to a low carbon and social inclusive urban system. Among SPLACH contributions, is the evaluation of the food system through an analysis of its spatial dimension, inclunding its typo-morphological layers, at the several stages of the food system.

This paper exposes the contributions of an ongoing task of SPLACH project which aims to expand the analysis of the food system of LMA through the spatial dimension. To do so, it applies the concept of CPUL in the LMA while identifying for the food system different stages, both their territorial implications and morphological outputs.

The more recent issue of the Urban Morphology journal (2019) acknowledges the importance of urban green spaces as a key problem for urban morphologists. This call for greater attention to the non-built aspects of cities meets the concerns raised by the need for a sustainable transition, pressed by several policy proposals such as the 2030 Agenda for Sustainable Development (UN, 2016) and the New Urban Agenda – Habitat III (UN, 2017). The problem of urban sustainability must encompass a discussion of what types of urban green spaces are most useful for such transition. The concept of Continuous Productive Urban Landscape (CPUL), as advanced by Viljoen, Bohn and Howe (2005) is a proposal for a continuous, mostly productive, territory infrastructure, whose role must accept both natural, economic and social dimensions, including agricultural diversity. Urban morphology has an important role here, in assessing the conditions of the territory to develop a CPUL and even to propose design solutions according to such conditions.

This paper introduces the results of an ongoing morphological exercise to LMA food system. In this context, it introduces the application of CPUL, by following the results of two specific surveys previously conducted by SPLACH project. One, a survey to the urban agricultural practices in the LMA, and another one, a survey which aimed to evaluate the level of integration of the food system concerns within the planning instruments, at the municipal scale, which are in force in LMA. More recently, the latter task has been extended to the historical roots of the urban planning of the Lisbon Region, whose territory roughly corresponds today to LMA. The information contained in those two surveys constituted the main data which supported the exercise presented in this essay.

The LMA and its productive aspect

The LMA constitutes an administrative territorial area, which includes 18 municipalities: Alcochete, Almada, Amadora, Barreiro, Cascais, Lisbon, Loures, Mafra, Moita, Montijo, Odivelas, Oeiras, Palmela, Seixal, Sesimbra, Setúbal, Sintra and Vila Franca de Xira. All these, do integrate both urban and rural land, expect Lisbon which is only urban. Today, the LMA is the most populated Portuguese metropolitan area, concentrating nearly 3 million inhabitants within 3000 km2 (INE, 2017). The SPLACH survey conducted to the municipal planning instruments found that each of those 18 municipalities had established its own land-use system (see Figure 1). In order to ease the visualization of such land uses distribution over LMA, the SPLACH Project systematized the identified land uses into six mains land-use typologies. Here we focus on only two of those typologies, namely the rural and the mixed uses (see Figure 2). This last one, mixed uses, includes areas of the territory, which do accept different kinds of activities, and that can co-exist in both urban and rural areas, and therefore these activities are not exclusive for any specific land use. Although such exercise was performed all over the LMA area, this essay will focus only in a specific area, which is Lisbon - Vila Franca de Xira, and shall be introduced further on.

Urban agriculture

The specific task of SPLACH project which consisted on a survey to current urban agricultural practices in LMA aimed to identify, at the production stage of the LMA urban food system, the location of such activities within the territory, why are they happening, how are they occurring, but also what spatial outcomes do they contain.

In Lisbon, the most recent Municipal Director Plan has classified all the land as

urban. Nevertheless, a number of significant urban agricultural practices are taking place within the city, in particular in its East-end area, named as Chelas Valley, where a considerable area of municipal allotment gardens and informal allotment gardens cover a considerable area within the Lisbon Municipality area. These allotment gardens areas, are located within the territory between Lisbon and the urban cores of Loures and Vila Franca de Xira municipalities, as can be identified in Figure 3. The number of situations present along such axis do indicate however the possibility of such territory to be analyzed as an opportunity to explore a possible East green axis for Lisbon territory, while connecting the city to its nearby surroundings municipalities, likewise had been attempted during 1930's ad 1940's with the East green axis for 'Costa do Sol' (Marat-Mendes, 2009).

The Lisbon – Vila Franca de Xira axis

This paper focusses its analysis on the East axis of Lisbon - Vila Franca de Xira, as this has been lest studied and explored from the green and agriculture perspective, but also because it endowers an opportunity to rethink the food system from a spatiality perspective, as identified in SPLACH project. In order to so, we will follow first a brief historical reading of the evolution of Lisbon urban planning.

During 1930s, when the first Portuguese planning documents were created and designed (only for settlements with more than 2500 inhabitants), the regional territory of Lisbon, the capital city, was of special interest given its urban growth. Rural populations were attracted to the city but also to the nearby smaller cities. A Regional Director Plan (PDRL), would be concluded in 1964, however it failed to be approved. Yet, one can testify earlier planning attempts at the sub-regional scale. For example, the 'Plano de Urbanização da Costa do Sol' (PUCS, 1935-1947), designed by Étienne de Gröer (1881-1952), which has been already examined (Pereira, 2009). This plan, covered an area between Lisbon and Cascais, on the west ed of the city, and determined the new tourist and leisure area, framed by beaches, low-rise residential areas surrounded by green spaces (rural areas, gardens and parks) which would be later converted into high-rise residential constructions (Marat-Mendes, 2009).

Yet, in 1947, Gröer was also called to create a foreground plan for the northern extension of Lisbon starting in Moscavide, a neighborhood in southern Loures, and ending in Vila Franca de Xira, which came to be approved in 1955. The plan, named as 'Anteplano de Urbanização de Moscavide a Vila Franca de Xira', can thus be considered as the first plan to establish the northern Lisbon axis. Likewise, 'Costa do Sol' axis, this new axis established a new regional sub-regional unit of Lisbon region. This it is very different from the 'Costa do Sol' sub-regional axis. While the former was predominantly touristic, this later one was significantly taken by large-scale industrial facilities, ranging from mills to concrete factories, with agriculture as another relevant activity. Particularly, in Vila Franca de Xira, agriculture extended to the Eastern riverbank, known as the Great Wetland (Grande Lezíria), and to four islets (mouchões) resulting from alluvial deposition (Rodrigues et al, 2016) on the Tagus riverbed.

Gröer's strategy was to adapt preexisting settlements and industrial facilities to the creation of the new urban units, through town-extensions and strategic use of free space while guaranteeing the protection of urban green space. As these soils were, already back then, acknowledged for their agricultural potential, even in the riverfront, the majority of space is reserved as rural area, while most urbanization is developed mostly westwards. While Gröer always placed a significant amount of free space within or around urban settlements, the zone classified as rural in this plan is only identified in the plan around these urban clusters, as a sign of protection, while the Tagus islets and Great Wetland have no land-use, perhaps due to property issues.

A municipal Masterplan for Lisbon was commissioned to Gröer in 1938, but due to technical difficulties this took nearly ten-years to be completed. The final version was only ready in 1948 and although it was approved by the Lisbon city Council, this was never approved by by the Central State (Marat-Mendes & Oliveira, 2013).

Gröer worked on the Moscavide – Vila Franca de Xira axis on one plan, while for

Lisbon he designed a Masterplan at the municipal scale. However, in 1964, the Regional Director Plan (PDRL) advanced for the first time an integral plan for the region of Lisbon. The Lisbon – Vila Franca de Xira axis is still highly recognizable in this plan, not only because it had been under development throughout the 20th century, but also because of the dynamics imprinted by the Gröer's Foreplan. All the territory is classified, including the Tagus islets and Great Wetland which are classified as rural, as is a small area of Vila Franca de Xira Western bank. In the case of Loures, a great amount of agricultural space can be identified, although nearly all of it is located in the interior of the municipality, and in particular proximity to the municipalities of Mafra and Sintra, also strongly rural. Yet, even by the 1960s, riverside urbanization is visibly stronger in Loures than Vila Franca de Xira.

After Gröer's Lisbon Masterplan was rejected by the Central State, a new one was started, but would also fail to receive the Lisbon Council approval in 1959. However, with both plans, their rejection did not keep it from providing de facto guidelines for the urban growth, designed through Urbanization Plans for the involved municipalities. In Lisbon, one key area is its Eastern end, which comprehends a set of valley systems. Blocked from the riverfront by industrial facilities and largely occupied with agricultural fields and some significant slumlands, the Chelas Valley became the territory were the most ambitious social housing program for Lisbon, was applied of its time. This consisted a high-rise new town in town, as identified by Teresa Heitor 2001, which echoed some radical ideas from international urbanism debates (Borges & Marat-Mendes, 2019).

In the original plan by the Technical Housing Office (GTH) of the Lisbon Council, the 'Chelas Urbanization Plan', as this Chelas Valley urbanization plan was named, is conceived as a large-scale set of neighborhoods clustered around a specific spot of service center, which was meant to be a sort of the departing point of Lisbon – VFX industrial axis, as already identified (GTH, 1965). Given its generous dimensions, 510 ha, Chelas was urbanized in phases, with the last ones finished in the early 2000s. The delays and revisions in the plan, alongside national shifts in social housing policy, sacrificed however the original urban structure as proposed in the original GTH Plan. Therefore, today Chelas has little significative links to the sub-regional unit planned by Gröer.

Only in 2002 a new regional planning instrument was delineated. In the Regional Spatial Plan of Lisbon Metropolitan Area (PROT-AML) it is possible to determine also the above-mentioned Lisbon – VFX axis (see Figure 4). However, most interestingly it is possible identify within this axis, the presence of several dimensions of the food system, including production, transformations, distribution, consumption and recycling, that are also present in a cluster from this axis (Figure 2). In this plan can be verified a triangulation between the stages of processing (Food industry factories) and distribution from the food system. The latter one concerns both national and international importations (Logistical hub) of food products and local food products (Supply Market).

Nowadays the Lisbon – Vila franca de Xira axis is relevant also because of its inter-regional importance (which Costa do Sol never had) establishing a relationship with the northern region of the Tagus Valley. A study (Antunes & Ferreiro, 2017) of rice production in the Tagus and Sorraia River-basins concluded it is done in integrated farming (i.e. restricted chemicals), helping preserve biodiversity and ecological stability, and promoting food security. However, and despite Portuguese rice consumption being three times the European average, culture is disappearing in this area, leaving unused soils which will hardly adapt to other agricultural types, and feeding the cycle of abandonment visible also in the rice-transformation industry in the area (Antunes & Ferreiro, 2017). Vila Franca de Xira occupies a special place in this context, as it is a passage from the Ribatejo to the Lisbon Region. But this very proximity also means that the agricultural land (especially if currently unused) in Vila Franca de Xira are especially seductive for non-productive activities and land-uses. This may be another instance in which, as Steel (2008) ironically suggests, green-fields are turned into scenarios for the rich. This is visible in the case of the 'Mouchão de Alhandra', on sale since 2016 by a company with veiled hints at land-use change (JE, 2016).

So, the challenge is to link what remains of agricultural production with the urban

territories, which at first seems to be difficult, considering how polarized urban and rural settings are in the LMA in general, including the Lisbon -Vila Franca de Xira axis.

The CPUL Concept

Introduced in the context of sustainable urbanism and architecture, CPUL expands the sustainability concept of Continuous Productive Urban Landscape towards a spatial dimension with the spatial which can be translated into an urban model which transforms contemporary cities towards 'an unprecedented naturalism' (Bohn & Viljoen, 2005, 11). Thus, it proposes are 'open landscapes' productive, in economical, sociological and environmental terms (Bohn & Viljoen, 2005, 11) while valuing the 'genius loci' (Viljoen & Bohn, 2005, 1). What this means is that the CPUL, despite having clearly stated spatial values, it is fundamentally programmatic, and its implementation depends on site-specific adaptations – therefore, it is strategic in the same way as Ebenezer Howard's (1899) Garden City model was.

A modest CPUL proposal

It is now important to attempt a possible application of the CPUL in LMA reality. Therefore, we proposed to test it first in a specific area, such as the Lisbon - Vila Franca de Xira axis. Given its historical sub-regional value and its continued, albeit fragmentary and chaotic planning, we suggest here a modest proposal of CPUL for the Lisbon - Vila Franca de Xira axis. This is less of a proposal than an exploration of possibilities allowed by planning and morphological analysis of this axis. Furthermore, we aim to identify possible spatial clues for the food system and urban planning. Taking urban-rural connections as a key purpose and through the results of our analysis, we aim to expose a possible continuous productive territory infrastructure.

The analysis of the Lisbon - Vila Franca de Xira axis implicated the survey and identifies of the productive, transformation, distribution, consumption and recycling areas (see Figure 6). For each of these areas, our analysis aims to explore morphological, each of them in order to identify, if possible, the various typologies which make part of current food system.

So far, we have already concluded the typo-morphological analysis of the productive stage. We have identified 3 types of urban agriculture uses and 12 morphological outputs of urban allotment gardens. The typologies were defined according to the type of management and administration of the allotment, while the physical features of the site have provided the basis for the morphological analysis.

The identified typologies of allotment gardens were: the Municipal, the Associative and the Informal allotment gardens. The municipal gardens regard formal and municipal management, also they are characterized by the various programs and initiatives in which they are inserted. The associative gardens are also formal, but their management is organized by associations founded from civil society initiatives. Informal gardens are regarded as illegal in nature, as they do not result from a formality expenditure, and are not managed by any entity, but rather by the farmers themselves, mostly individually, but in cooperation with their neighbor farmers. They are also characterised by their emergence in isolated parts of the territory where socio-economic difficulties occur.

For the morphological analysis of the allotment gardens we have identified 12 possible outlines, inclunding: orthogonal grid, orthogonal grid with the size of the variable plots, grid adapted to the terrain, regular grid adapted to existing irregular forms, grid generated by footpaths, grid adapted to stream, adapted to the ruin, narrow strips, ellipse shape, circular shape, isolated and support elements for agriculture (see Figure 5).

Most interesting is the fact that these allotment gardens are located nearby the mixed use spaces, which were identified as spaces of opportunities, within the interface between the urban and rural areas and suppresses, through the urban agriculture, the urban-rural divide.

The Lisbon -Vila Franca de Xira axis although it was originally labelled as an industrial axis in the 1950s, and later in 2002 an industrial and logistical hub, because of its contemporary agricultural presence, we believe it can be revitalized as a continuous

food system productive landscape.

Thus, our work aims to test this modest proposal and our next task will involve the typological and morphological analysis also in other dimensions of the food system, apart from the productive stage, in this particular axis, and therefore fulfil a further morphological account for future urban forms regarding the food system.
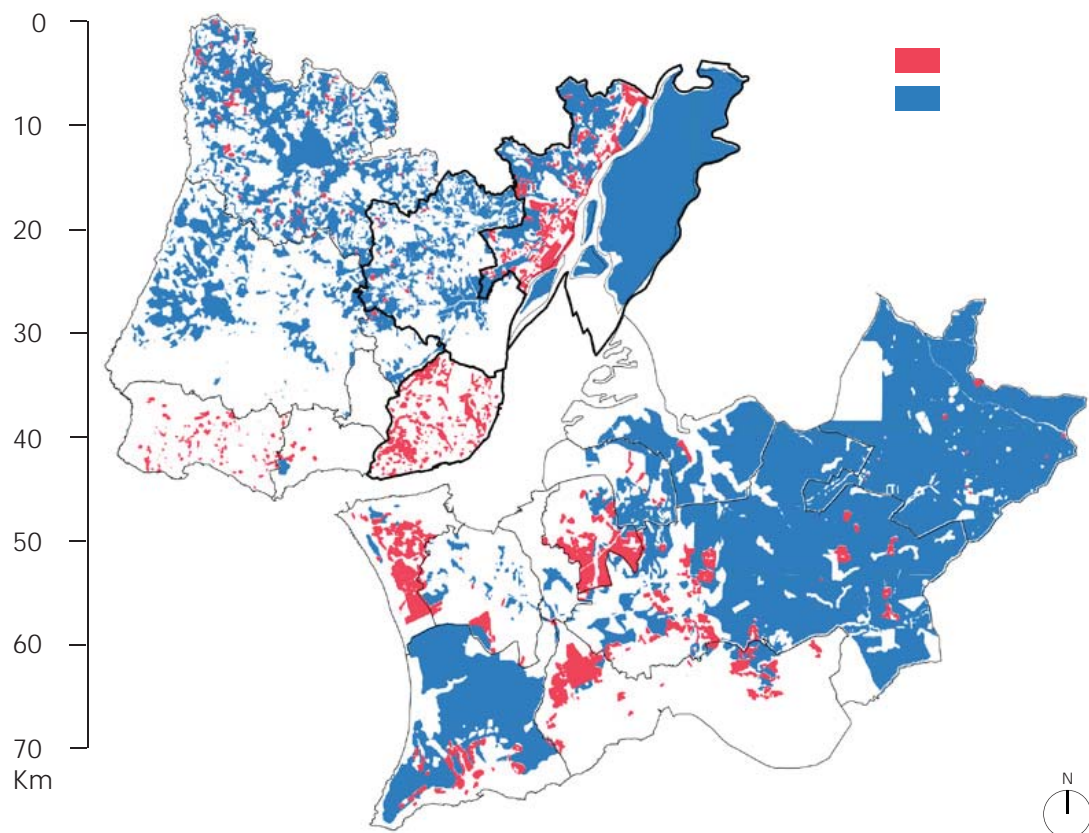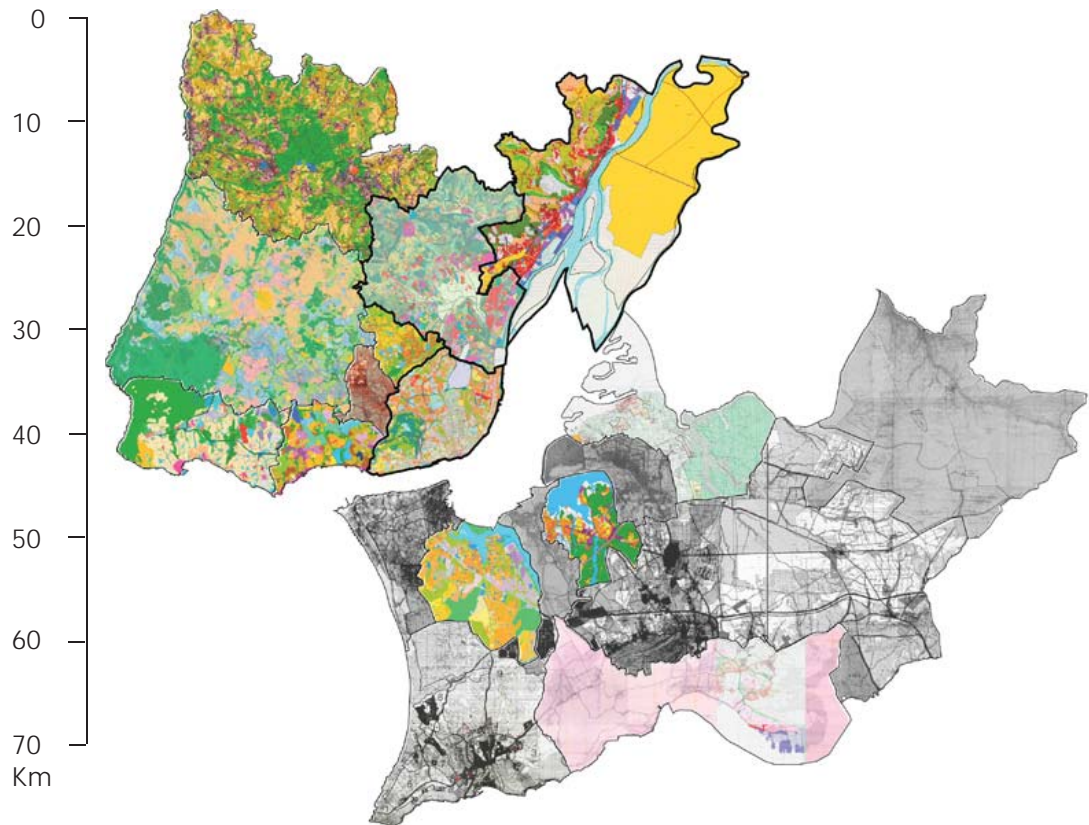
Figure 1. LMA Municipality's development plan (PDM) Land-uses;
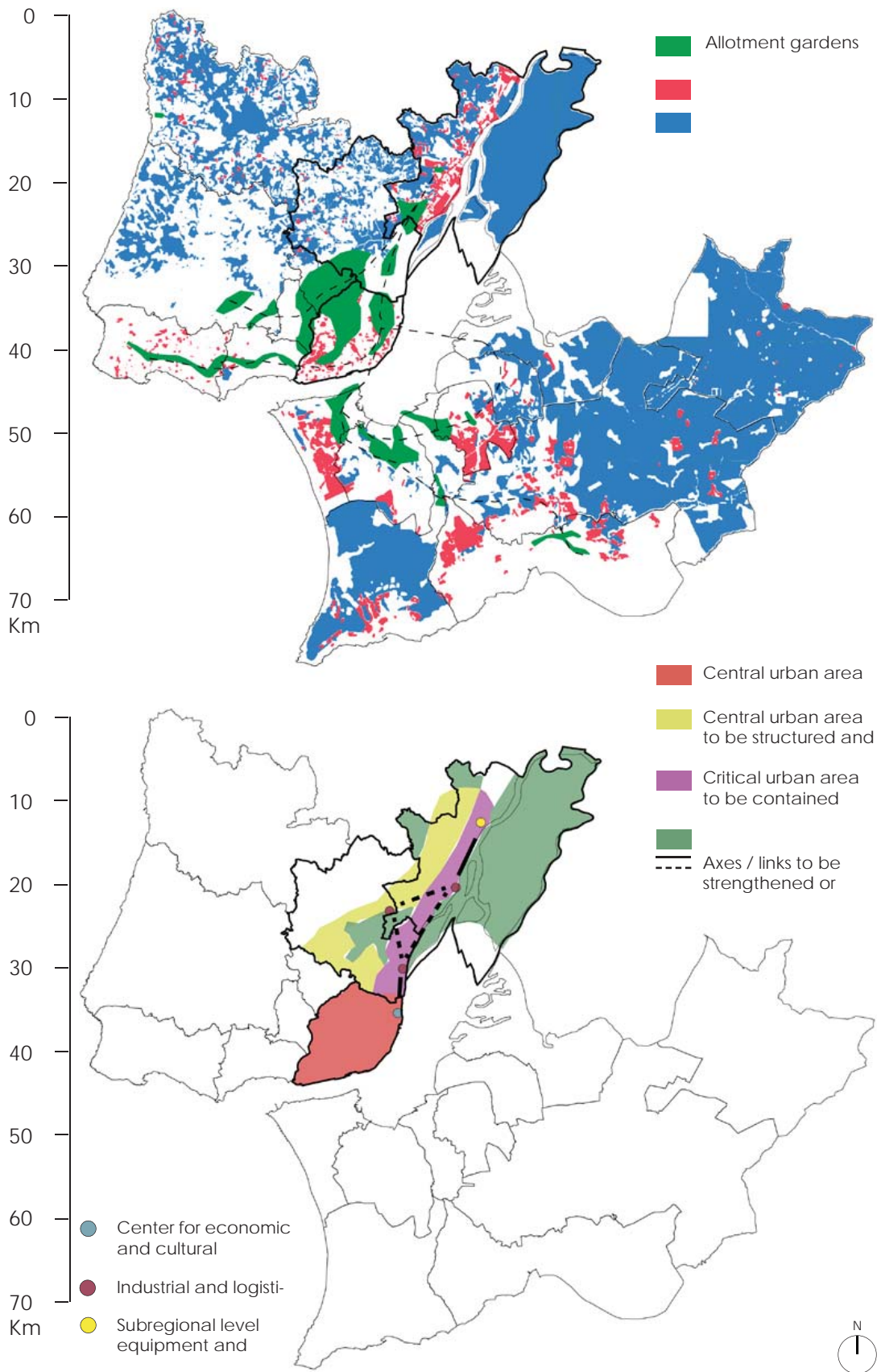**Figure 2.** LMA Land-uses: Mixed land use (red) and rural (blue).

Figure 3. LMA Urban agriculture: Land-uses and urban productive clusters;
Figure 4. LMA Strategic axis and land uses from Regional Spatial Plan (PROT 2002).
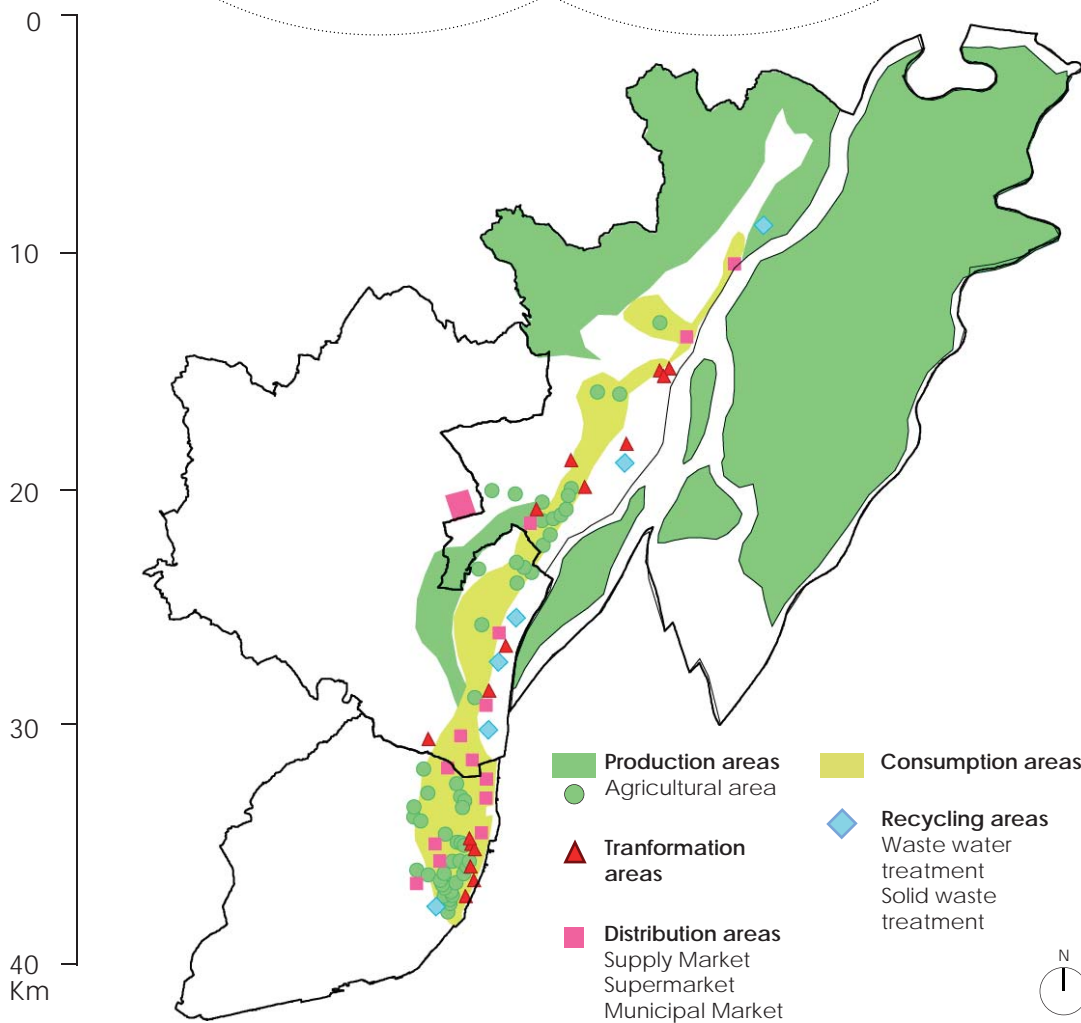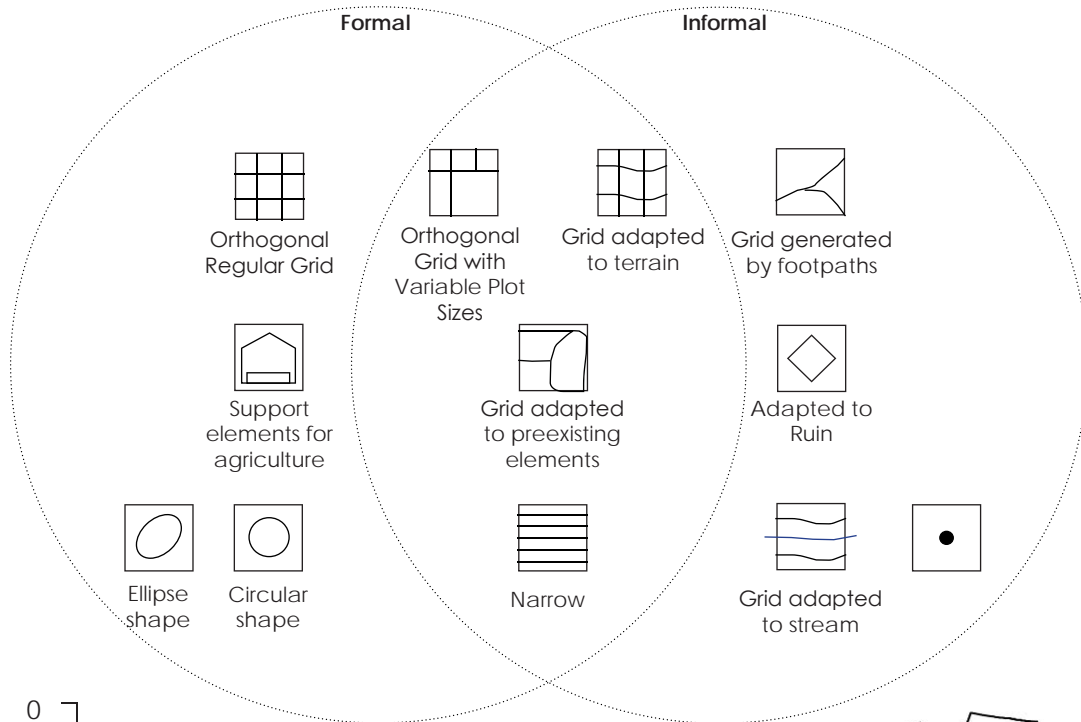
Figure 5. Morphologies of allotment gardens in LMA; Figure 6. Food System survey on the axis, proposed as agricultural axis, Chelas - Vila Franca de Xira.

Captions

Fig.1 - LMA Municipality's development plan (PDM) Land-uses.

Fig.2 - LMA Land-uses: Mixed land use (red) and rural (blue).

Fig.3 - LMA Urban agriculture: Land-uses and urban productive clusters.

Fig.4 - LMA Strategic axis and land uses from Regional Spatial Plan (PROT 2002).

Fig.5 - Morphologies of allotment gardens in LMA.

Fig.6 - Food System survey on the axis, proposed as agricultural axis, Chelas - Vila Franca de Xira.

Source for figures in this paper: SPLACH Project.

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Reproduction of the Edge as a Vitrine in Odunpazarı Historic District, Eskişehir

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Abstract

Eskişehir has become a brand in city planning and a major destination in domestic tourism in Turkey in the last ten years. The new role of "museums quarter" that is attributed to the edge of Odunpazarı historic district settled on hillside has a significant role in this branding process. The museums quarter separates the historic and modern parts of the city. However, the area was once lined with landmark historic houses, facing the main street going downward towards the city's landmark train station. These houses, with a traditional Eskişehir architecture, were demolished during the street widening works in the 1980s. Neighboring the new boulevard, the rest of the demolished area stayed underused until 2000s. In the 2000s, buildings with an architecture similar to traditional Eskişehir architecture were constructed from scratch with modern construction materials. These new buildings that are built to be used as museums have defined the new edge for the historic district and they soon became a brand in domestic tourism. In 2019, the design of this vitrine is completed with star architect Kengo Kuma's Contemporary Art Museum. In this context, the study will explore this reproduction process from the 1980s to 2019 through historical analysis method and will investigate the "hows" and "whys" of the reproduction focusing on the planning and design decisions that lead to morphological changes, and the roles of the actors in the process.

Introduction

Eskisehir is a medium-sized Central Anatolian town by the Porsuk River with an advantageous location between two major cities of Turkey: the global city of İstanbul and the capital, Ankara. Beginning with 1999, becoming a liveable city became the vision of Eskisehir Metropolitan Municipality (EMM - EBB) and related multi-task works resulted in turning the city a model in Turkey. The reproduction of the northern edge of Odunpazari historic district (in Lynch's terms, Lynch, 1960), that connects the area to the modern town has a particular role in this branding process. Odunpazari historic district, including the study area, was first designated as a conservation site in 1973 (Ulu, 1994), when Conservation Act No.1710 was issued in Turkey; the first conservation initiations in the area began in the 1980s. However, the street widening works in the 1990s started the profound morphological changes in the tissue. In this framework, this study will investigate the hows and whys of this change through historical analysis. To achieve the aim, two scales will be looked at. Major changes in the city scale that can be related to the brand image, and conservation and development decisions in the study area scale will be examined between 1980 and 2020 under four sub-periods of ten-year interval. The study is part of a detailed analysis of the study area, made in the graduate course of 'Historic Urban Landscape' in Eskisehir Osmangazi University, Department of Architecture, with Conzen's morphogenetic method. The data is gathered from previous academic studies, strategic plans and annual reports of EMM, the archives of EMM Conservation Implementation and Supervision of Cultural Assets (KUDEB), the archives of Eskisehir Regional Council for the Conservation of Cultural Property (Eskisehir Kültür Varlıklarını Koruma Bölge Kurulu, Eskisehir KVKBK) -before 2011 it was Eskisehir Regional Council for Conservation of Cultural and Natural Assets- and the archives of Odunpazari Municipality (OM -OB).

Odunpazari historic district is settled on Bademlik Hill in central Eskisehir and it is a small part of Odunpazari municipal area. Eskisehir was declared a metropolitan city in 1993; following it, Eskisehir Metropolitan Municipality and two sub-municipalities, Odunpazari at the southern side of the Porsuk River and Tepebasi at the northern side, were founded (Koç, 2018). In common use, the name 'Odunpazari' corresponds to the historic settlement; therefore, it will be used as such in the study.

Development of central Eskisehir until the 1980s

The central city, which is divided into two by the Porsuk River, has been settled down since the ancient times thanks to its well-known hot springs near the River. Under the Seljuk rule, Alaeddin Mosque was constructed in 1220 in Odunpazari (Ertin, 1994), marking where the Turkmens were settled separately from the other ethnic groups. It stands at the north edge of today's historic district (Figure 1a). Hot spring area was the main trade and recreational area and it continued to be as such in the Ottoman Era, whereas the Turkmen settlement extended towards the south on Bademlik Hill (Dogru, 2005 cited in Kıvılcım, 2008). In 1525, Kursunlu Kulliyesi, consisting of a mosque, madrasah, caravanserai and soup kitchen was built in Odunpazari (Eskisehir Metropolitan Municipality, 2006).

At the end of the 19th century, an important development affected Eskisehir: Berlin-Baghdad railway was opened in 1892 (Efe, 1998 cited in Yılmaz and Yetgin, 2018). This led to the industrialization of Eskisehir, starting with the establishment of a small wagon and locomotive repair workshop (Cer Atölyesi) by the Germans. An important effect of the railway and the station on Odunpazari is the new street that directly connects the station to the Turkmen settlement on the hill (Figure 1b).

In the beginning of the 20th century, linked to the upgrading of the Ottoman education system, model schools were introduced. Its first example in Eskisehir was Turan Numune School built between 1915-1916 in the north edge of Odunpazarı by famous Turkish architect Mimar Kemalettin (Ministry of Culture and Tourism, 2019).

During the Turkish War of Independence, the commercial and residential area near the River was destroyed by a massive fire in 1922. Following the establishment of the Republic of Turkey in 1923, new commercial and residential development took place connecting the hot springs area and Odunpazari (Ertin, 1994; Kıvılcım, 2008). The pedestrian street, called as Hamamyolu (Hammam Way), transformed into a street-mall with

traditional commerce on both sides, leaving the middle part to green and Akar Stream (a small branch of the Porsuk River, Figure 1a and 1b).

As an effect of the railway, the city was one of the firsts in the Republic of Turkey that gained industrial character, which it kept until the 1980s. The industrial sites lied close to the station and the River. The industrial development, together with the mechanization in agriculture in the 1950s led to an intense rural-to-urban migration, increasing the population of the city. The concept of 'flat ownership', which was introduced in Turkish legislation in 1954, opened the way for multi-storey buildings. In 1956, the first master plan of Eskisehir was approved (Koca, 2005 cited in Kıvılcım, 2008). The Plan proposed new residential area -military, therefore in borders without any permeability- and a new boulevard -Atatürk Boulevard- to the west, which constitutes the western context of the study area today. Despite the Plan had no building-storey decisions, it later led to development of 8-storey buildings, facing the northern border of Odunpazari (Özkut and Yılmaz (Ed), 2011), creating contrasting and conflicting tissues on two sides of the main street entitled Seyit Gazi (Figure 3b). With the construction of new buildings in the town centre, the wealthy families started to abandon Odunpazari in favour of modern buildings, marking the beginning of filtering down in the area.

The Plan extended the commercial centre towards the industrial area in the north. In 1958, Anadolu University was founded in Tepebasi district as the first university of the city. With the opening of the northern highway and the university, residential areas also extended towards the north after the 1960s (Ertin, 1994). According to Ertin (1994), the slope of Bademlik Hill formed a natural threshold; therefore, Seyit Gazi Street passed from the northern border of the historic district in east-west direction. Despite the threshold, Şeyh Şehabettin Street (new name Kemal Zeytinoglu Street) -east border of the study area-, cutting Odunpazarı urban tissue into two was opened in 1970 to connect the city centre and State Engineering and Architecture Academy (current Bademlik Campus of Eskisehir Osmangazi University) and the city's main recreational area on Bademlik Hill. In 1973, Odunpazari was designated as a 'conservation area' by Act No.1710 (Ulu, 1994).

The study area between the 1980s and 1990s

In 1981, 202 traditional buildings were registered by Higher Council for Immovable Antiquities and Monuments (Gayrimenkul Eski Eserler ve Anıtlar Yüksek Kurulu- GEEAYK). The process restricted interventions to the houses, accelerating their decay. In 1986, a new 1/5000 scale master plan was prepared for the city and its implementation plans in 1987, 1988 and 1989 were approved by the Municipality (Koç, 2018). The Plan envisaged the widening of the main street at the northern border of Odunpazari, turning Seyit Gazi Street to a boulevard as a continuation of Atatürk Boulevard (approved by the 1956 Plan) opened at the same era -after its intersection point -node in Lynch's terms- with the Atatürk Boulevard, Seyit Gazi Street continues as a main vehicular street bordering the military residential area-. The first Odunpazari Conservation Plan is approved by Konya Regional Council for Conservation of Cultural and Natural Assets (Konya KTVKBK) in 1988. However, according to the 1986 master plan of the city, five registered houses facing the direct street to the landmark station and superimposing with the proposed boulevard had to be removed. Konya KTVKBK declared that it could only be possible if measured survey projects of the houses were submitted to KTVKBK to reconstruct them either in the same urban block or in suitable areas preferred by the Municipality (Decision n.168-29.4.1988).

Meantime, industries started to move to the organized industrial zone at the eastern periphery, leaving their old factories at the centre. The city, which started losing its industrial image, gained an educational identity. In 1989, seven houses, which are used as Anadolu University Guesthouse today, were bought by Anadolu University (Kıvılcım, 2008), when Prof.Dr. Yılmaz Büyükerşen, the later major of the city, was the rector between 1982-1993. Turan Numune School designed by Mimar Kemalettin was transferred to Anadolu University the same year. Boğaziçi Yakut (2016) states that this was the first work in the area to conserve the traditional buildings.

The study area between the 1990s and 2000s

The five registered houses superimposing with the new Seyit Gazi Boulevard were demolished in 1993 without doing measured survey (Ulu, 1994). During the works, another important element of town identity, Akar Stream was also closed being claimed to cause pollution. When the houses, having node-defining landmark value facing the direct street to the station were demolished, the defined edge of the historic settlement also disappeared and the legibility of the area lost (Figure 4). The level of difference after the opening of the Boulevard worsened the situation.

Meanwhile, Turan Numune School was reopened as the Museum of History of the Republic in 1994, as the first museum at the north edge of Odunpazari. In 1996, Eskisehir KTVKBK was established and the Conservation Plan was revised in 1997. In 1999 local elections, Prof. Dr. Yılmaz Büyükerşen, ex-rector of Anadolu University, was elected as the new mayor of the Metropolitan Municipality with a vision of a clean, green, art and high-culture city (Koç, 2018). The vision also required a new edge to the historic district, which had been turned into no man's land.

The study area between the 2000s to 2010s

Büyükerşen's initial projects were affected by several factors, a significant one was the Porsuk River's image as one of the most polluted waters of Europe according to the Organization for Security and Cooperation in Europe. The River had been polluted for many years by the industry nearside. As a result, the rehabilitation of the River to use it as an economic and a social catalyst for further development became the initial project (Şimşek, 2011). The aim was achieved; riverside turned into a lively place with many cafes and encouraged further investment. The following projects continued as: developing sustainable transportation modes such as tramway, creating cultural events, urban parks, restoring the historic district, adaptive re-use of the industrial heritage in Tepebasi, building hotels and museums in different places. Koç (2018) comments that these initial projects, pursing a branding strategy, were to improve the living conditions of the inhabitants and ensure liveability rather than international competition for capital. Nevertheless, they grabbed media's attention and started to attract domestic tourists. Koç (2018, 121-122) interprets the situation as "This is a locally focused and initiated policy on city branding but it has also given birth the making of Eskisehir a model city with a brand of liveability in national level."

In 2002, EMM started Historic Odunpazari Houses Conservation and Development Project covering the study area (Figure 3c). The Project, including the restoration of three registered buildings and construction of   reinforced concrete imitations -not reconstruction- of historic Odunpazarı houses, aimed the conservation of the traditional image while it actually aimed to create a new edge to the historic district to make the district perceivable again. According to EMM, the Project would foster economic development of Eskisehir and encourage tourism (Eskisehir Metropolitan Municipality, 2006). The first works in Odunpazarı triggered others and restorations of Odunpazari Houses and street rehabilitation projects, realized by different institutions such as Anadolu University, EMM, OM, Governorship of Eskisehir, Turkish World Association (Koç, 2018) and General Directorate for Foundations, accelerated the revitalisation of the historic district. In 2000s, several facilities were added to the area by different institutions that contributed to the revitalisation: Museum of Cartoon Art -in the edge but outside the study area- in 2004 by Anadolu University; Atlihan Handicrafts Bazaar -the south neighbour of the study area- in 2007 by OM; Contemporary Glass Art Museum -in the study area- in 2007 by EMM in the scope of city museums strategy; Meerschaum Museum -in Kursunlu Kulliye- in 2008 by OM. In the second half of the 2000s, with the popularisation of Odunpazari, the interventions that different institutions desire to realise started to increase in number. These intentions by diverse institutions, EMM and OM as the leading ones, started to result in many amendments in the 1997 Conservation Plan, leading to challenges and confusions in the process.

Development of the study area between the 2010s to 2020s

Yılmaz Büyükerşen was elected as the major for the third, fourth and fifth time in the local elections of 2009, 2014 and 2019 respectively. In the 2011-2015 and 2015-2019 Strategic Plans of EMM, being a model city in museology, being the city of art galleries and exhibitions, conserving the historic and cultural heritage are among the six goals of the Strategic Plans. In this perspective, the study area thrust itself forward by becoming a focal implementation space of these three major goals of the city out of six. In this period, different from the previous period, branding strategies started to transform into competitive strategies and these strategies generated more investment focused actions. This can also be understood from Strategic Plan 2011-2015, which clearly states that the share of industry in total economy would continue to decrease, as such, Eskisehir's gaining a tourist value is seen as a long-term opportunity. Relatedly, development of tourism, particularly regarding cultural and art activities and Eskisehir's hot-spring identity and thus hammam culture, became a major policy. Besides EMM, OM had its own vision for Odunpazari as a tourist destination; therefore, its action plans included rehabilitating and revitalising the area through street rehabilitation projects and restoration of individual buildings. To act freely in realising their intentions within the scope of their visions, municipalities tend to expropriate building plots in private properties; yet, the principle of 'public interest' is obliged to be provided prior to the claim for expropriation. To fulfil the condition, municipalities claim for 'municipal service areas' (MSA -BHA), a concept defined in the spatial planning legislation, which are areas used for meeting a large range of public needs. Therefore, when a property becomes MSA, it means that it will serve for the public interest. Once the transformation of a property into MSA is approved by the competent authority, right of eminent domain is obtained by the municipality. In addition, in areas where there are more than one competent municipalities -in metropolitan cities-, such as Odunpazarı Conservation Site, there is no written regulation clarifying the owner municipality of a certain MSA; municipalities share the MSAs between each other by unwritten rules. The MSA claims of EMM and OM for later expropriations and the new functions they propose were long causing challenges in the implementation process of the 1997 Conservation Plan through amendments in the scale of lots or lot-groups, making a sustainable conservation process much more difficult. As a result, to ensure a holistic conservation approach for Odunpazari, OM prepared the revision of the 1997 Conservation Plan in 2011 (Figure 2b). It was approved by Municipality Councils and Eskisehir KVKBK the same year. Besides, street rehabilitation projects were continued by OM. Within this framework, three streets inside the study area, corresponding to the commercial area in the southeast according to the Revised Conservation Plan, were rehabilitated.

Within the framework of the defined goals of the strategic plans, EMM continued with the actions of opening new museums, particularly in the museum complex in the study area: EMM City Memory Museum in 2012, EMM Yılmaz Büyükersen Wax Museum in 2013, EMM Liberation Museum in 2016. Future museums to be added include: Museum of Turkish Music; Museum of Ceramic Arts; Museum of Photography; Museum of 20th Century Toys; Museum of World Women (Eskisehir Metropolitan Municipality, 2011). In 2014, due to the leading role of Odunpazari Historical Urban Site in one-day touristic excursions to Eskisehir, as a continuation to the previous Odunpazarı Houses Conservation and Development Project, a new project is given a start by EMM at the edge of Odunpazari, enlarging the previous project borders. The new project, entitled 'EMM Odunpazari Touristic Development Project' (Figure 3e), aims to create a neighbourhood of museums and culture. The rational behind the Project is regenerating the depressed areas around the previous project area to contribute into city life. The Project includes Contemporary Art Museum, Hammam Museum, commercial units and multi-storey parking. In 2015, EMM put the construction work of the Contemporary Art Museum, cafeteria and commercial units out to tender in regard to State Bidding Law (Eskisehir Metropolitan Municipality, 2015). Contemporary Art Museum Complex has art gallery, art workshops, exhibitions spaces, museum, multi-functional saloon, hotel, bookstore, administrative and office units (Eskisehir Metropolitan Municipality, 2015). The tender was won by Polimeks Holding, of which chairman of the executive board is Erol Tabanca, an architect with the hometown Es-

kisehir. Polimeks Holding preferred to work with world famous architects Kengo Kuma and Yuki Ikeguchi for the complex, which was opened in 2019, attracting international attention in world architecture platforms such as Archdaily, dezeen, designboom and so on.

When the huge data on conservation including related registrations, property movements, demolitions, expropriations, functional changes, planning amendments, etc. obtained from the archive of Eskisehir KVKBK is examined, it is seen that more than 10 lots were expropriated; many 2011 Conservation Plan amendments were approved by Eskisehir KVKBK; several registered buildings, neighbouring the Contemporary Art Museum, were demolished to leave free space for the Museum and not to prevent its visibility. During the preparation and implementation phases of the Project, sometimes there have been dissensus between Eskisehir KVKBK and EMM on the interventions to several either registered or unregistered buildings, such as demolition or reconstruction in another block; there have also been court cases between the property owners and EBB regarding expropriations in certain lots.

Discussion

In 2017, Hammam Museum, on the west outside the study area was put out to tender (Eskisehir Metropolitan Municipality, 2017). Nevertheless, the Project area of EMM could not much further extend towards the west in the future since the area is blocked with the institutional small campuses and military residential areas along Seyit Gazi Street. The border of Odunpazari Historical Urban Site superimposes with the eastern border of the study area; therefore, the study area is located in the buffer zone of the Historical Urban Site. This administrative border turned into an opportunity for EMM to claim MSA in the study area to act freely. In relation to this, due to being in Historical Urban Site, similar policies cannot be extended towards the eastern part of Zeytinoğlu Street as the rest of the northern edge of Odunpazari, including the Museum of History of the Republic. Whereas, the part of Seyit Gazi Street that behaves as the continuation of Atatürk Boulevard and the neighbouring 8-storey apartments towards the city centre limits public spaces for the pedestrians. Despite this limitation, since the opening of EMM Yılmaz Büyükersen Wax Museum in 2013, it is seen that long visitor queues, starting from the gates of the City Museums complex extending for blocks till the military residential area, form. This phenomenon in the future may lead to the urban regeneration of the blocks that include the 8-storey buildings without any architectural quality. This way, the new vitrine can connect with the other historic areas such as the ex-factory area, in other words, the industrial heritage, with the hot-springs area and the rehabilitated riverside in the city centre creating a public space network defined with history, recreation and commerce, but also resulting in another huge process of urban morphological change.

Conclusion

According to brand identity, Koç (2018) specifies different images for the city: between the end of the 19th century and the foundation of the Republic in 1923, Eskisehir was a one-functioned city, it was an 'agricultural town', which was ruined during the Turkish War of Independence (1919-1923); it became a multifunctional city in industry and commerce between 1923 and the 1960s; from the 1960s to the 1980s, with the active role of the Chamber of Commerce Role and the investments of firms, the city gained the identity of an 'industrial city'; with the degradation of the industrial identity from the 1980s to 2000s, city's identity transformed into a 'university city'; and as the last, from the 2000s onwards, 'European city & liveable city' became the brand identity. With the second decade of the 2000s, the attempt of getting share from the global capital started more investment-focused policies turning the city into an entrepreneurial one. Within this picture, the study area, once a local significant node bordered with traditional but modest landmark buildings, forming the edge of the historic Odunpazarı district was erased and transformed into a global vitrine.
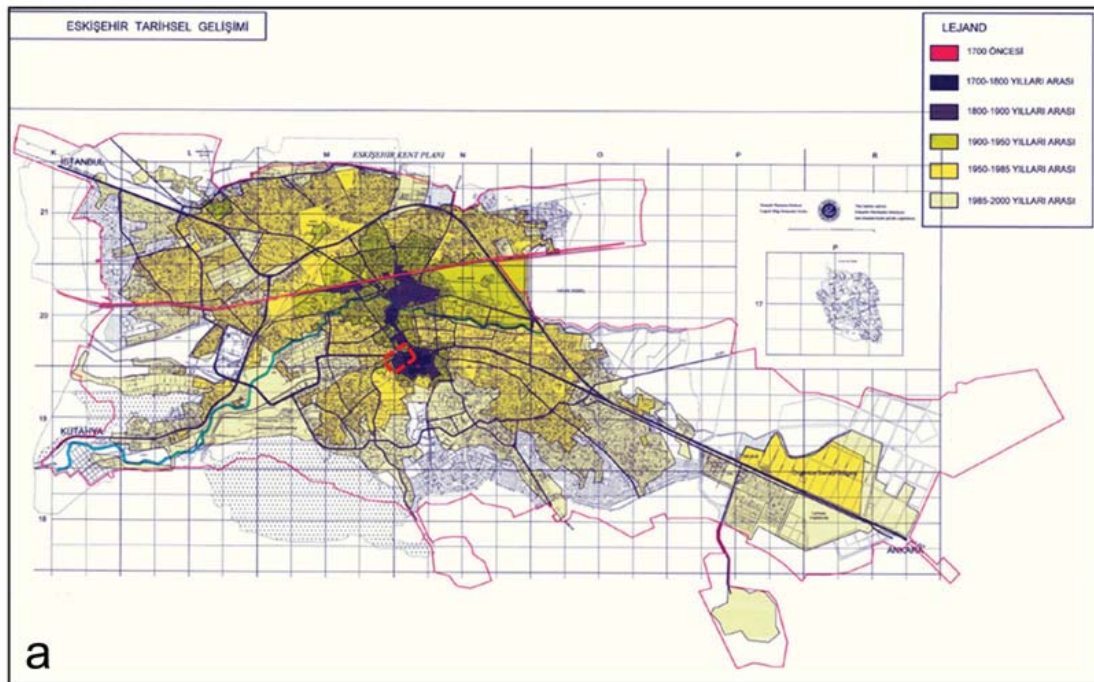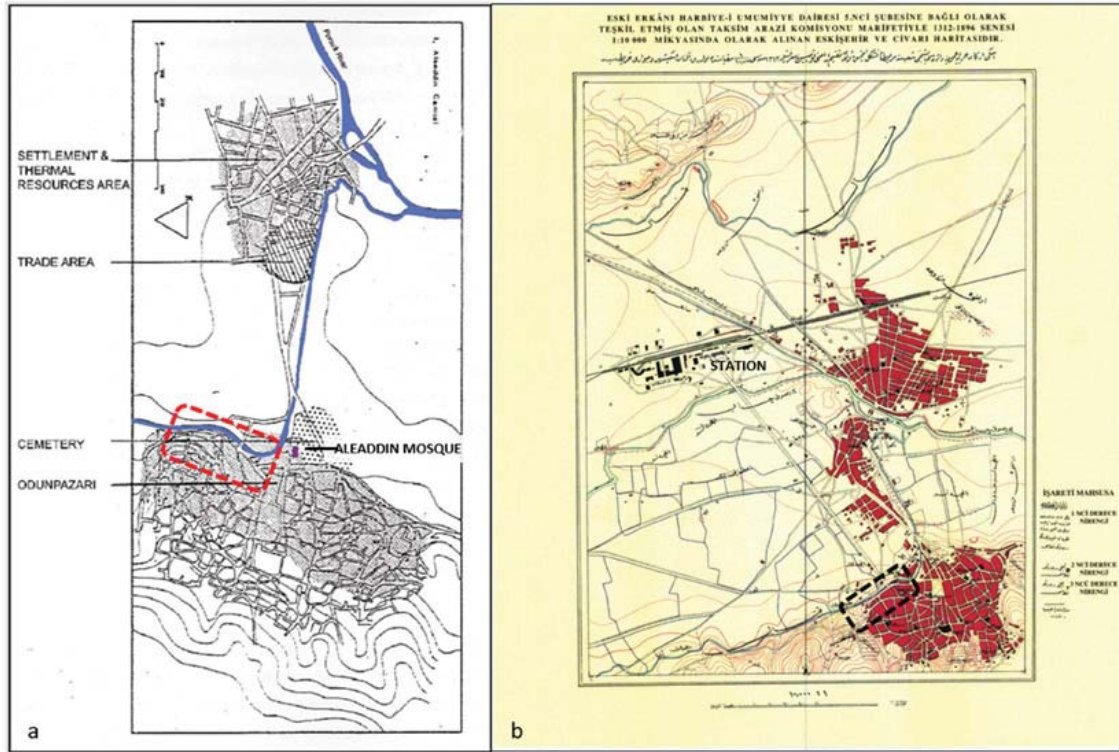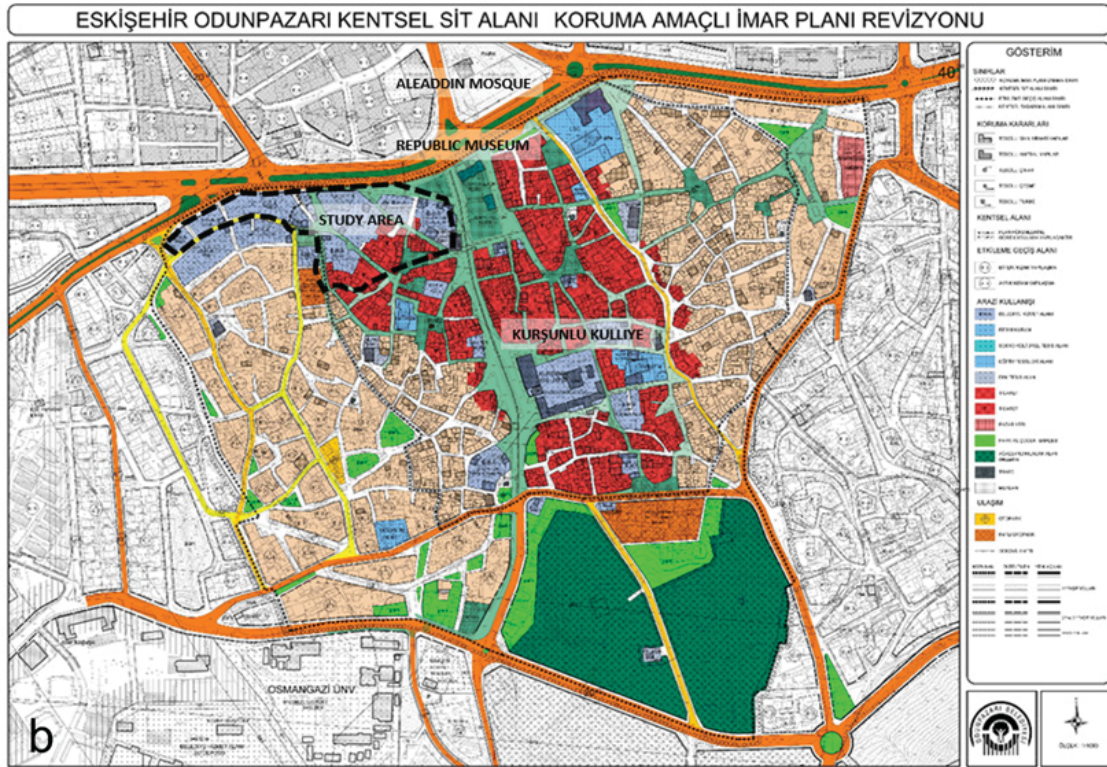
Figure 1.

ESKİŞEHİR ODUNPAZARI KENTSEL SİT ALANI KORUMA AMAÇLI İMAR PLANI REVİZYONU
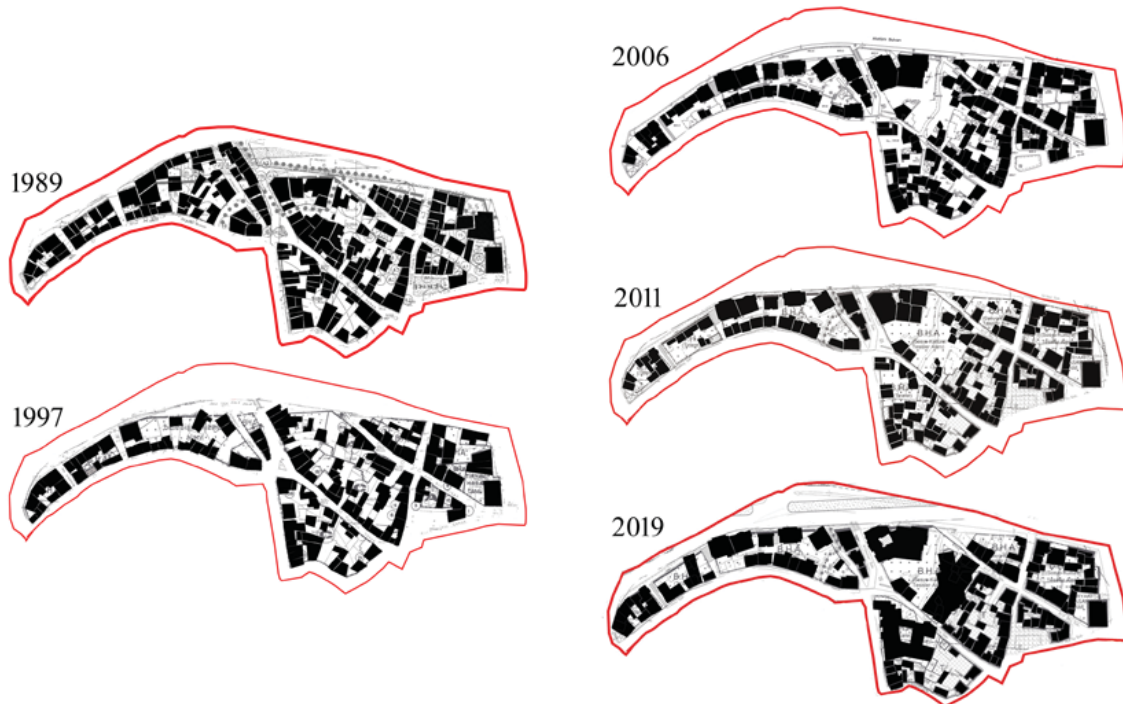
Figure 2.

Figure 3.

Figure 4.

Caption

Figure 1. a. Eskisehir at the end of the 13th century: the Porsuk River, Hot Spring area, Akar Stream, trade area and the settlement areas near the River and Odunpazarı (Kıvılcım, 2008,   Fig.3.4. after Tanyeli, 1986, Levha 3.14). The study area is marked with red. b. Eskisehir in 1896, prepared by the Ministry of War's Division of Land Commission (Eskisehir Metropolitan Municipality). The study area is marked with black.

Figure 2. a. The development of the city by Tufan Mut (Kıvılcım, 2008, p.98, Eskisehir Metropolitan Municipality). The study area is marked with red. B. The Revision of Eskisehir Odunpazarı Conservation Plan (Özkut and Yılmaz, 2011) The study area is marked with black.

Figure 3. a. The edge in 2015 (eskisehir.bel.tr). b. Two sides of Seyit Gazi Boulevard (2020 by the study group). c. Historic Odunpazarı Houses Conservation and Development Project by EMM (Kıvılcım, 2008, p.151). d. The edge as the vitrine with Kuma's Contemporary Art Museum (mimaritasarimveelestiri.wordpress.com). e. EMM Odunpazarı Touristic

Figure 4. Figure-ground analyses of the four sub-periods between 1980 and 2020

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Development Project (Eskisehir Metropolitan Municipality)

Trisungo: a typological-procedural research for the recovery of a village hit by the 2016/2017 earthquake.

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Abstract

Trisungo is a small valley-bottom village developed on the two banks of the Tronto river, in the Arquata del Tronto municipality (AP). It is historically connected with the roman route Salaria that joins Roma and Ascoli and, in this municipality, it connects also Norcia and Fermo. This settlement has always been a nerve centre for the commerce of Central Italy and this is the reason why we can find there an incredible florid XVI-century architecture. After the earthquake, Trisungo suffered important damage, without arriving at a total destruction. Starting from a multi-scalar reading of the village (landscape-settlement-urban fabric- building types- constructive techniques) a series of recovery-tools are proposed. Within this layout are presented some pilot projects for both blocks and buildings with the overall aim of combine conservation and safety improvement. The contribution sets out the importance of a systematic approach to the post-disaster reconstruction based on the typological-procedural research in order to outline the inalienable identity features of an historical center. The only way to assure a kind of reconstruction consistent with the nature of the settlements and in continuity with their historical development is to base the recovery designs on the comprehension and re-proposing of these identity characteristics.

Post-seismic reconstruction in Central Italy

Three years after the seismic events which upset the central Apennine area, the assess of the reconstruction is disarming. The process is completely blocked.

In many municipalities the emergency works, such as clearing rubble or building safety, have not even been completed. Calls for designs for the historic centers are late and private reconstruction is stalled in the complexity of the bureaucratic machine. The state of immobility in which local administrations find themselves is the result of a chain of factors.

A material factor: the earthquake of 2016-2017 is (considering only the events of the recent past) minor, according to size and extent of the crater, only to the disastrous Irpinia's earthquake: 4 regions involved, 140 municipalities affected with more than half of the building heritage destroyed

or unusable, 2,500,000 tons of rubble, 300 victims and more than 48,000 displaced people[1].

Another critical factor is of a management nature with the perpetuation of the financing methods used in Umbria-Marche 1997 earthquake[2]. This method identifies private owners as the beneficiaries of the state funding to reconstruction and if it worked well for an earthquake characterized by limited damages to buildings, it is instead risky in a scenario, such as that of central Italy, where the object of the reconstruction are not the individual buildings but the entire settlements.

In this context, the difficulty in coordinating private resources risks blocking the entire reconstruction process, as it's happening in most of the municipalities involved.

Finally, a socio-economic factor contributes to this immobility, which is concerned with the intrinsic fragility of the area concerned.

An area that of the Umbria-Marche Apennines, mostly mountainous or hilly, characterized by a very low population density and dotted with hundreds of small or medium-sized historical centers.

This territory was affected, even before the last seismic events, by important depopulation phenomena (40% of the municipalities had less than 1,000 inhabitants before the earthquake) caused by scarce employment opportunities, the remoteness of services and a strong housing distress[3].

The geographical-administrative conformation of the crater, which encloses the less populated internal areas and the more peripheral fringes of the four regions involved, has condemned this reconstruction to be unattractive from an economic and political point of view, relegating it at the end of the political agendas of these last years.

The village of Trisungo: *reading* of the settlement

The issue of partially damaged villages.

In this complex situation there is the problem related to the villages that suffered more or less important damage without arriving at a total destruction. These centers, due to their partial damaged situation, have not been included in the "perimetrazioni[4]." by the municipalities and they will not receive a unitary recovery project (Zampilli and Brunori, 2018).

Apparently this particular situation could speed up the recovery process, that shouldn't wait for the calls for design, but actually it opens to the risk of an uncontrolled reconstruction, careless to the conservation of identity features and not completely effective or safe.

This is the case, for example, of many settlements of the municipality of Arquata del Tronto: Borgo, Colle, Trisungo, Spelonga and others.

We have deal with these fractions thanks to the according[5] between the university of Roma Tre and the municipality of Arquata del Tronto that included, amongst other research activities (Zampilli and Brunori, 2019), the realization of a "Manuale del Recupero", on the entire municipal territory, made up by an analytic dictionary of the villages main features and an intervention's handbook.

Amongst the settlements "non perimetrati" of Arquata del Tronto's area, the village of Trisungo is particularly interesting and unique. We operated a systematic multi-scalar reading of this center in order to understand its identity components, and their interactions, with the overall aim to define design practices consistent with the settlement's historical nature and consistent with the *readability* of the typological features.

The reading method.

This research follows the solid tradition of studies aimed to the preservation and protection of architectural heritage, particularly the so called minor one, the basic buildings heritage.

Italian tradition which has been developed in autonomous and original way in the architecture school of the University of Roma Tre, in the work of Paolo Marconi and his colleagues on recovery manuals (Giovanetti, 1992) (Giovanetti, 1997), fundamental for understanding the traditional way of building. At the same way the work of Antonino Giuffré on the Codes of practice (Giuffrè, 1993), an irreplaceable tool for the correct use of traditional constructive techniques for securing historic building.

The roots of this school are in the principles of philological restoration and also in the typological-procedural research of the school of Saverio Muratori (Muratori, 1963) and particularly the outcome of this research in the work of Gianfranco Caniggia in interpreting the formative process of the urban fabric and building types also in order to understand the mechanism of aggregation of building boxes (Caniggia, 1979). These mechanisms of aggregation lead the buildings to different behaviors during the seismic event, so it's really important to understand it in order to solve but also to prevent specific damage.

Starting from the signs left by the historical stratifications, our reading of Trisungo reconstructs backwards the process of formation and transformation of the entire settlement and tries to outline the identity matrices that define the village (at the different scales: landscape, settlement, urban fabric, building types, construction techniques), (Brunori, Cretarola and Zampilli, 2016).

Arquata del Tronto's territory.

The research started from the scale of the landscape for which, thanks to the analysis of both natural features and anthropic ones, the territorial invariables that characterize the municipality of Arquata del Tronto are detected.

This area is really particular because it is located at the confluence, on the Tronto river, of two different geo-morphological and natural systems: the Monti Sibillini system and the Monti della Laga one (and of the corresponding National Parks). The valley bottom is marked by the Tronto river, that sailing the homonymous Valley, to which runs parallel the ancient roman route Salaria. This route connected, today as in the past, Rome to Ascoli and, in this area, it also distributes to Fermo and Norcia (Dall'Aglio and Giorgi, 1997).

The paths-system is completed by the hillside road network, which connects the different villages, and by the ridge-paths network, from whom, at the beginning, the territorial anthropization started.

Within this framework it is located the village of Trisungo, a valley bottom historical center, developed on the two Tronto river banks and conditioned, throughout its history, by the relationship with the important road artery Salaria.

This settlement stood in a nerve center for what concerns the commercial and cultural exchanges of Central Italy and that could be the reason why we find, in a peripheral territory, a so florish 16th century-architecture (probably connected with the presence of *comancini*'s craftsmen that from the northern Italy moved, following the economical flows and the commissions, toward the Umbria and Marche regions).

The settlement of Trisungo: reading of the urban substrata and structuring features.

In order to understand the identity components and the genesis of the settlement, we started from the realization of a base map on which the interactions between different historical maps can be read and on which develop the critical readings.

This base map is the result of the re-drawing of the official land register, fundamental to understand the ownership structure and the land subdivisions, on an aerial-survey basis, that is more trustworthy for what concerns geometry and that is accompanied by altimeter data.

On this basis we created thematic maps: the pre-earthquake state with the precise indication of the special buildings; the post-earthquake state with the analysis of the demolitions and of the damages through the classification of the "schede Aedes"; the comparisons between the nineteenth-century land registers (Catasto Pio Gregoriano of about 1824 and subsequent update of 1881) that allow us a clearer reading of the settlement components of the inhabited area because they don't present the recent modifications

and building's additions.

We defined, then, the structuring features of the settlement thanks to the study of historical land registers and thanks to the analysis of the relationship between the road structure and land ownership structure.

Following these analysis have been enlighten: the generative paths of the settlement, the fences of ancient court-houses (that are present today at different stages of clogging, the row-houses built on the edge of the main paths, special buildings, alignments and territorial signs attributable to ancient planning (Fig.1).

All these elements define the identity of settlement arrangements and reflect the outcome of the long process of formation and transformation that each historical center has gone through over the centuries

The two main nucleus of Trisungo, which were kept compact until the beginning of the nineteenth century, developed specularly on the banks of Tronto. The centers are, however, quite distant from each other, so as to suggest that initially they were two distinct settlements, a hypothesis that would also be confirmed by the toponyms reported in the Gregorian land register which identify *Trisungo* in the southern settlement and the *Ponte* district in the northern one.

Originally the Salaria route (as at the beginning of the 19th century) ran between the northern town and the Tronto, crossing the river (with different bridges depending on the time) to connect to the southern town and then continue on the right bank.

The matrix path of the two settlements is clearly the Salaria route. A series of court-yard house fences were arranged perpendicularly to this path, the scan of this fences is still clearly visible in the analysis of the alignments and discontinuity of the urban fabric.

The modularity with which the fences are repeated, about 15 meters in front and 20/30 meters deep, would suggest a planned plot of which, however, we have not enough confirmations.

The ancient urban fabric, present in the maps of the Gregorian land register of 1824, develops almost entirely inside the court-yard fences with an occupation of the space that follows to three different typological models (Fig. 1). All these models are influenced by the threatening presence of the river that forced to build over the centuries leaving a wide space of respect to contain the damage caused by the floods.

This would explain the singular characteristic of the Trisungo fabric which presents the *clogging* cells in the area in front of to the oldest buildings, unlike the classic model which sees the original units, aligned on the roadside , clog gradually the back pertinent area.

In both inhabited areas the original line, on which the fronts had to be placed, is still clearly legible both on a plan level and in the walls-discontinuities.

The fabric on the right bank configures as a succession of well-recognizable court-yard house, about the size of 15x20 meters, and some courtyards, at the outermost edge of the inhabited area, dimensionally out of standard (about 20x40), sufficiently typical if compared with similar fabrics found in other fractions of the same municipality.

The anomalous dimensions could be connected to an ancient agricultural lots, subsequently occupied by both residential and agricultural buildings, as demonstrated by the coexistence of barns, houses with *gafi* and so on.

A series of lines of fronts advancement can be found throughout the town due to the widespread presence of the protruding bodies of the *profferli* (the external traditional stairs) whose progressive occlusion has caused, over the centuries, the movement of the façades to the detriment of the road section.

At the edge of the matrix paths, portions of row-houses' fabric have gradually developed, connecting, through the only nineteenth-century bridge left, the two inhabited areas.

Urban blocks.

Moving to a lower scale, we analyzed urban blocks for which we studied an urban fabric portion particularly significant for building variety and damage state (Fig. 2).

The critical relief detects all these discontinuity, found on the plans and on the façades, which demonstrate the aggregative process of fabrics.

This allows, first of all, us to interpret the still visible signs of the evolution process to outline

the urban block entire formation history.

The goal is to understand the system of subsequent additions, and so strengths and weaknesses, that is fundamental to understand the behavior of a block of buildings during the earthquake. In fact the block behavior depends on the degree of connection and on the continuity of the masonry-box.

This kind of analysis is a useful tool to detect the damage mechanisms trigged by the seismic event and to understand what was the structural cause. The aim is to develop restoration design consistent with the structural set-up of the historical organism and aware about the interaction between the different buildings forming the block.

Buildings: the detection of the typological invariants.

For what concerns the building scale we did a reconnaissance of the architectural heritage of the fraction, and of the whole municipal territory, in order to realize an abacus of the basis building types and their synchronic and diachronic variations (Fig. 3). In addition to this summary tab we punctual studied and made survey of some buildings which are emblematic on a typological and architectural point of view.

The historical built of Trisungo is marked by a capillary presence of house *a profferlo*, both in the basis type with the stairs parallel to the front and in its typological variant with the stairs perpendicular (configuration probably due to the new spatial needs resulting from the complete occupation of the street fronts) also grown in high with multiple floors.

The street front is characterized by two bands of openings usually in columns, excepting for the houses in which remains the archaic layout with a window at the first floor near the door in a semi-central position. The layout is completed by an entrance portal to the residential floor and larger portal, at the ground floor, that originally gave access to the commercial activities.

Some of these houses maintain a 16th century layout and are configured as little monocellular *palace* with triple floor consistency in their mature state. These buildings have an high quality masonry, portals, windows frames and other stone elements. Other houses, part of this building type, present more modest architectural features or characteristics typical of a 18th century, or later, language.

This building type brings with it, in this territory, the presence of wooden elements projecting, named *gafi* or *bufirie* (Fig. 3)*.* These elements, born originally with the double function of *profferlo*'s covering and of external space for the harvest storage, become, in time, wooden balconies directly connected with the residential spaces and present also in overlapping floors. Today many of these elements are occluded, partially or completely, with a consequent advancement of the entire building front.

The *gafi* are elements extremely characteristic of this built environment and of its originally link with the peasant traditional economy. Unfortunately they are equally fragile and in danger, both for a material-constructive reason and for their scarcely correspondence to the contemporary housing models.

Another building type very popular, and strongly characteristic, is that of the 16th century small palace which reach its maximum expression in the *twin-palace.*. The *twin-palace* is the greatest witness of the 16th century building richness of the Arquata's municipality. This richness is probably connected with the presence, at that time, of the *comancini*'s Lombard craftsmen that were skilled and fine stonemasons.

These buildings are bi-cellular on the street front with a strong central axis of symmetry, sometimes they born directly with this unifying arrangement but, more frequently, they resulted from the doubling of a pre-existing building box. The façade is the typical *casa a profferlo* one, but doubling it and favoring the archaic layout with a window at the first floor in a semi-central position and two spread apart windows at the second floor. This building type is characterized by a strong 16th century architectural language that involved the masonry, made with blocks of squared stones, the portals, usually twin at the main floor, and the others stone details.

The urban fabric of Trisungo is completed by 19th-20th century buildings distinguished by a regular front layout with openings in columns (two opening bands for the row-houses and, usually, three for the small *palace*) and with two or three floor consistency without

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dimensional hierarchy. They are clearly different from the more ancient types also for a larger distance between openings and lateral bearing walls.

Tools for the village recovery

The design and the realization of the interventions of conservation, completion, reconstruction and replacement of the damaged building heritage have as main goal the safeguard of typological, architectural and structural features of the historic center, as the result of a constructive tradition made up in centuries of civilian life.

For a "non perimetrata" fraction, as Trisungo, the challenge is to assure the conservation of these general urban values while remaining within the limits imposed by interventions allowed only on the single building units.

The goal, for the urban scale, is to guarantee the building units' articulation that represent the original "structural step", excluding substantial alterations to the access and overlooking mode. At the same time it is essential to enhance the persistence of the land subdivisions of the substrata types of court-yard houses; in other words it is important to keep every plan signs, every fronts alignments and every urban fabric articulation that are evidence of the procedural evolution of the settlement.

In the guidelines for the recovery of Trisungo village we suggested the "perimetrazione" of two different urban areas (Fig. 1), even in the awareness that this operation could be very complex from an administrative point of view.

The first area involve the portion of fabric that maintained better the *readability* of architectural and urban features typical of the 15th century. In addition to its historical-testimonial value, this fabric portion is a very compact block, in which every building collaborates and is structurally "supportive" with the neighboring buildings. This aspect would make the restoration of small compartments of the block (the single building units) complex and not very effective in terms of improving structural safety.

The second area, more extended than the other, involve a large part of the south settlement. This fabrics were, before the earthquake and the subsequent demolitions, strongly over-layered and *over-clogged* both in plan and in elevation.

In plan we observe an advanced *clogging* state with a more or less completely occupation of the pertinent areas of the ancient courtyards. These *clogging*, as well as the excessive growth in high, are often made of building boxes scarcely connected with the pre-existing houses and they will represent a double problem during the reconstruction process.

On one hand there is a safety issue: these building boxes, less structural *supportive* with the rest of the fabric, risk to collapse sooner than the others and, insisting on the areas that were open-spaces in the past, would make very complicate the realization of efficient escape-routes and safe places.

On the other hand this kind of fabric represent a problem for the future of the center. The clogging and the extreme growth in high have resulted in confined spaces, scarcely aerated and lighted and not healthy. If we want to give an opportunity to survive to this village, thinly populated even before the catastrophe, we should make this urban fabric habitable again.

Both the issues cannot be resolved by a private intervention on the single houses but they deserve a unitary and general design based on controlled *thinning*[6].

Thinning should be carried out basing on a real knowledge of this specific historical fabric and it should be make in continuity with its procedural development and, therefore, with its mechanical functioning.

In addition to this indication we produced to the municipality a classification of the entire settlement in order to define for every single building the restoration and reconstruction interventions allowed.

Buildings are classified in 5 safeguard degrees[7] according to their historical-architectural and typological value but also to their *urban value* (Fig. 1).

This *urban value* is given according to the presence or absence of the building in the historical land map and according to its role in the definition of the fabric. In other words it has been considered the level of congruence with the logic of settlement arrangements: buildings belonging to the clogging fabric of the courtyard house or to the fabric of row-house;

building developed in continuity with the historical urban fabric or in expressed discontinuity.

The allowed interventions range from the philological restoration to the demolition with faithful reconstruction including also the demolition with reconstruction in the original plan. The overall aim is preserving or re-proposing the main features of the historical center and the buildings typological features.

For this purpose, we have supported the drafting of some pilot recovery-design for the buildings, with punctual indications about those architectural features that allow a correct typological *readability* and whose conservation is indispensable in the restoration and re-construction designs (Fig. 4).

The final goal is to enhance these typological *invariants,* trying to preserve particularly:
- The original features of the distribution system that characterize the different building types, especially the articulation of portals and entrance halls, internal stairs, balconies, terraces, *profferli,* loggias and underpasses.
- The architectural autonomy of the single building units marked by: the façade lay-out connected to the distributive and structural layout; the proportional configuration of the fronts; the alternation of solids and voids; the symmetries, but also the a-symmetries and dis-continuities as witnesses of the procedural evolution of the building.

The definition of these features is aimed to be a tool for the municipal administration in the evaluation of the private owners' proposal of recovery in order to orient the designs to an aware enhancement of the buildings' typological variety.

Conclusions

The activities described above are aimed at understanding and interpreting the settle-ment features and the damage provoked by the earthquake, in order to set up the inter-vention criteria for the damages-compensation and to schedule the actions for the future reconstruction.

The recovery designs have to be able to combine the exigence to secure and improve the structural strength of buildings with the conservation of their identity features that shouldn't be irreversibly altered (Zampilli, 2017). These features are the expression of a constructive tradition settled in centuries of communitarian activity to satisfy the housing necessities and improve life conditions. Often the building activity has been conditioned by the need of reconstruct or fix buildings damaged by the frequent and disastrous earthquakes that have affected the Appenine's area. This contributed to the formation of a "seismic local culture", still visible today in the several traditional elements for the seismic prevention (like chains and counterforts). These elements, together with a constant maintenance, made up of small and necessary interventions, have allowed many buildings, also those of ancient formation, to overcome the earthquake with few damages.

This seismic culture of good constructive-practices is detectable not only in the construc-tive details but also in the choice of the sites and the way to settle, disposing houses in rela-tion to the orographic characteristics and favorable solar-expositions.

These good practices, result of a secular tradition handed on from generation to gener-ation, are getting lost in these last decades. It would be appropriate to reconquered them, not only for the design and the realization of the post-seismic recovery interventions but also in order to improving the structural efficiency of traditional buildings in the so called "peace-ful times".
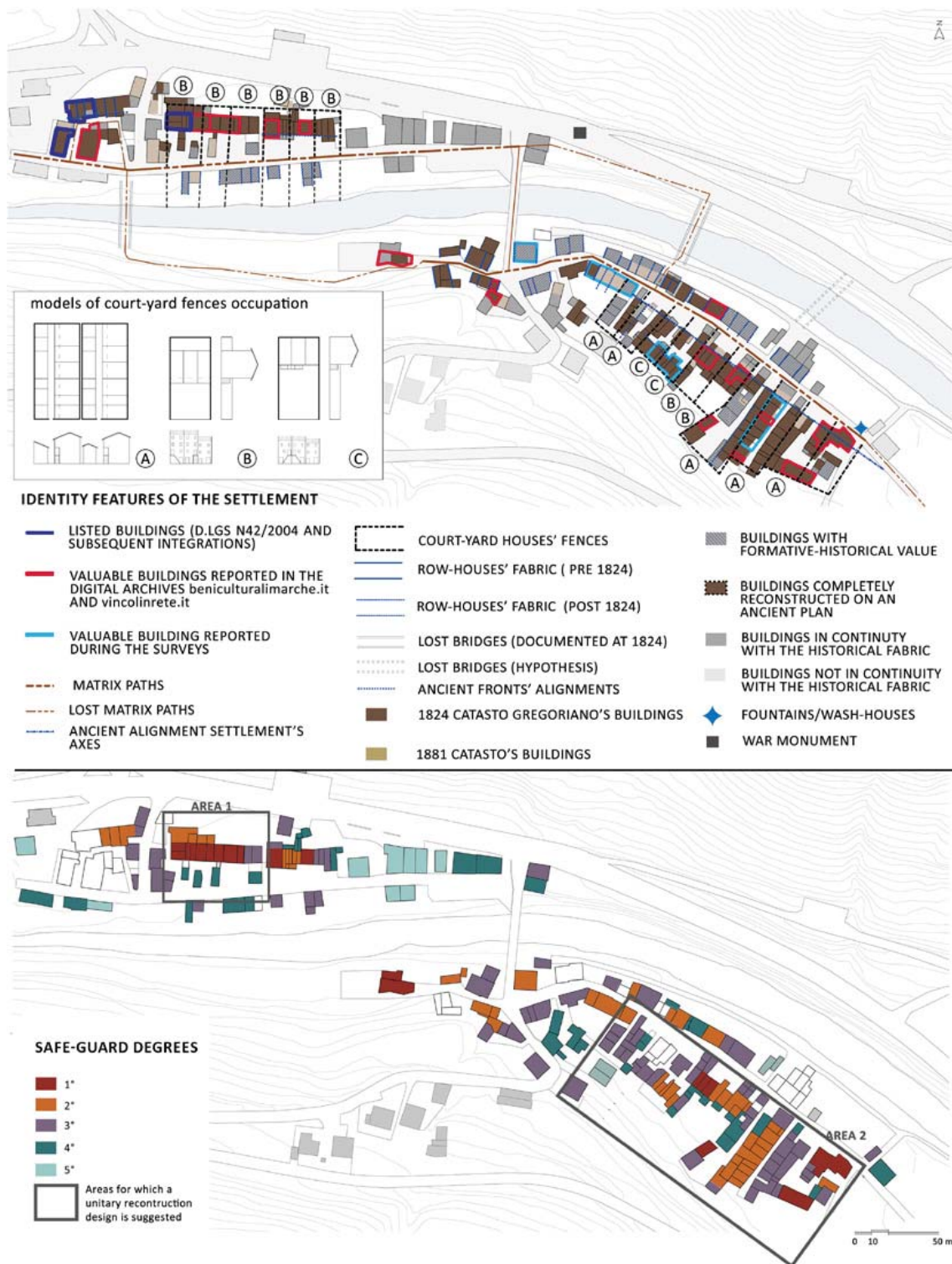
IDENTITY FEATURES OF THE SETTLEMENT

LISTED BUILDINGS (D.LGS N42/2004 AND SUBSEQUENT INTEGRATIONS)	COURT-YARD HOUSES' FENCES	BUILDINGS WITH FORMATIVE-HISTORICAL VALUE
VALUABLE BUILDINGS REPORTED IN THE DIGITAL ARCHIVES beniculturalimarche.it AND vincolinrete.it	ROW-HOUSES' FABRIC (PRE 1824)	BUILDINGS COMPLETELY RECONSTRUCTED ON AN ANCIENT PLAN
VALUABLE BUILDING REPORTED DURING THE SURVEYS	ROW-HOUSES' FABRIC (POST 1824)	BUILDINGS IN CONTINUITY WITH THE HISTORICAL FABRIC
MATRIX PATHS	LOST BRIDGES (DOCUMENTED AT 1824)	BUILDINGS NOT IN CONTINUITY WITH THE HISTORICAL FABRIC
LOST MATRIX PATHS	LOST BRIDGES (HYPOTHESIS) ANCIENT FRONTS' ALIGNMENTS	FOUNTAINS/WASH-HOUSES
ANCIENT ALIGNMENT SETTLEMENT'S AXES	1824 CATASTO GREGORIANO'S BUILDINGS	WAR MONUMENT
	1881 CATASTO'S BUILDINGS	

SAFE-GUARD DEGREES

- 1°
- 2°
- 3°
- 4°
- 5°
- Areas for which a unitary recontruction design is suggested

Figure 1. Identity features of the settlement and models of court-yard fences occupation. Graphic elaboration by Giulia Brunori.
Classification of safe-guard degrees.

Figure 2. Critical survey of the urban block with the indication of: walls-masonry discontinuities (as juxtaposed masonry, occluded openings, growth-high lines and so on); settlement discontinuities (as occluded ambitus, occluded entrances and wall flexes); anti-seismic elements (as chains or counterforts); damages and crack pattern.
Hypothesis of formation stages of the block.
Analysis of the collapse mechanisms activated by the seismic event.
Graphic elaborations by Giulia Brunori, Edoardo Fabbri, Enrico Pagano, Lea Fanny Pani.
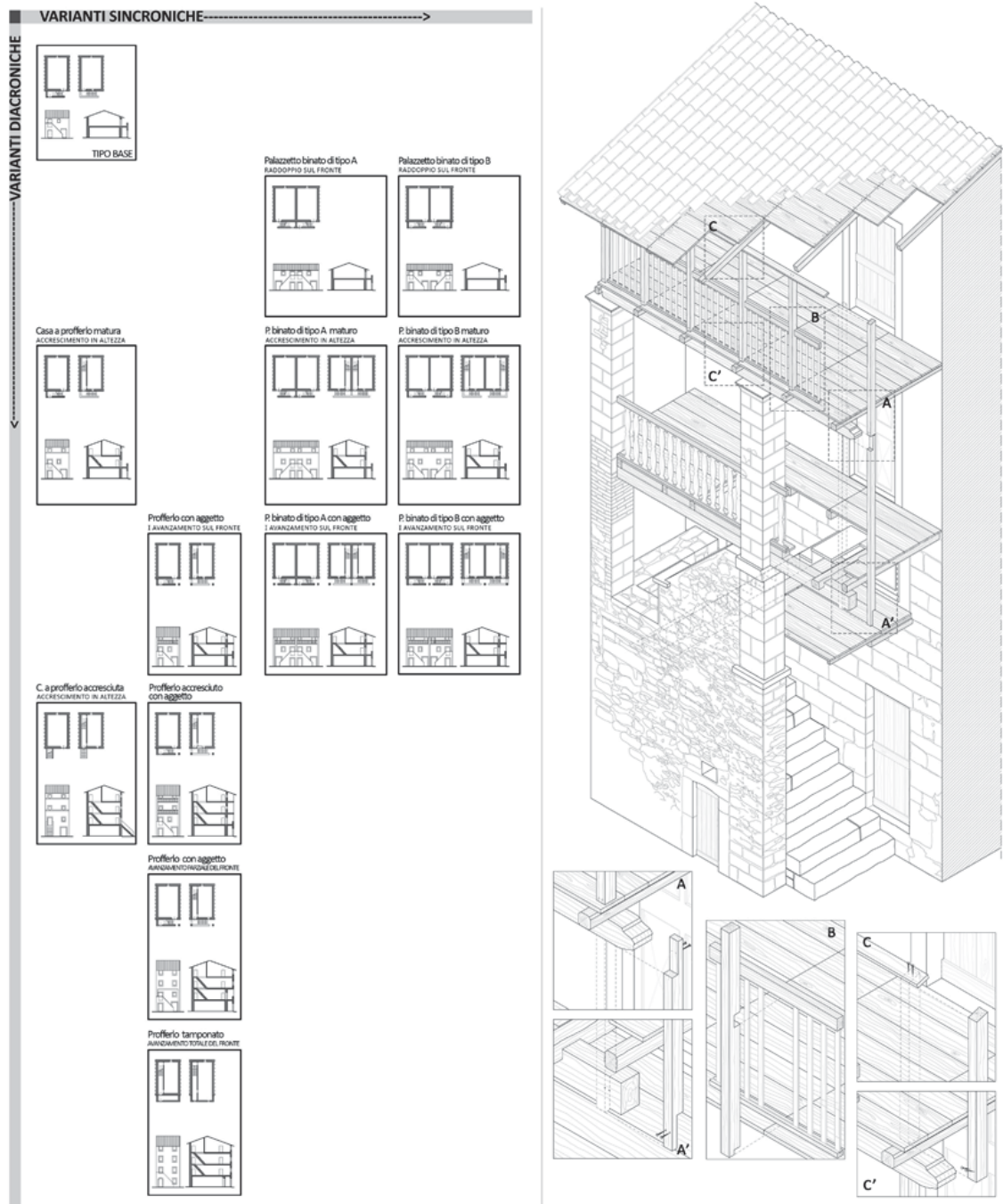
Figure 3. Building types abacus (excerpt of the type 'house with profferlo' and 'twin palace'), graphic elaboration by Arianna Baldoni and Giulia Brunori; House with gafi, graphic elaboration by Marianna Larovere.
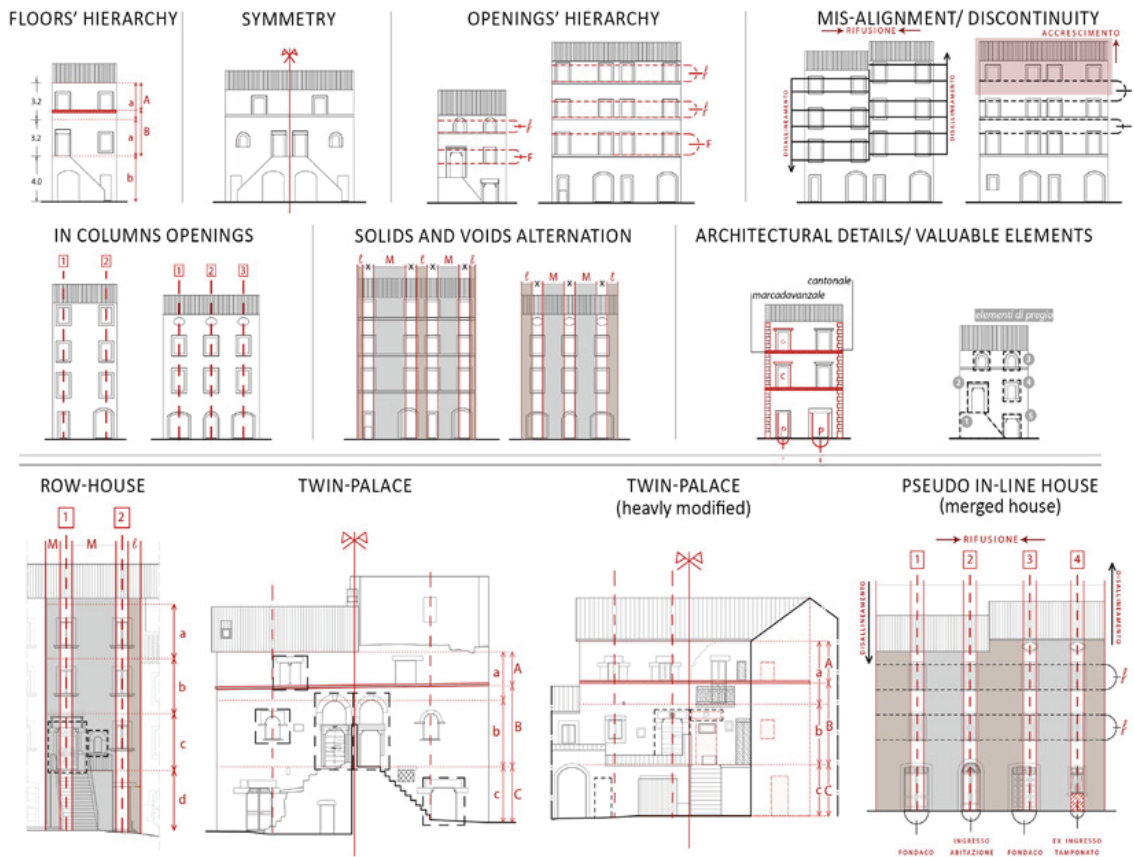
Figure 4. Individuation of the typological main features of building fronts and reading-example on real cases of Trisungo fabric. Graphic elaboration by Giulia Brunori.

Footnotes

[1] https://sisma2016.gov.it.

[2] In 1997 a series of seismic events stroked the area of Central Italy and particularly the Umbria and Marche regions. Even if the seismic crater was quite extended, the collapses involved above all the monumental architecture while the residential buildings were more or less damaged without arriving to a total destruction of the settlements.

[3] This phenomena is part of the larger issue of Italian internal areas for which today it is necessary a serious and urgent program of developing and economical reconversion, with a subsequent secured of the historical built. (Brunori and Magazzù, 2020). This is the purpose of the SNAI (National strategy for the internal areas) with whom Italy want to stop the demographic fall and to re-launch the develop of peripheral areas. http://www.programmazioneeconomica.gov.it

[4] With the order n.25 of 2017, the special commissioner for the reconstruction, has decreed the criteria for the *perimetrazione* of the towns, or parts of them, involved in the earthquake. Perimetrazione is the delimitation of some urban areas for which is needed a uniform reconstruction project. Once adopted the implementation plan (order n.39 of 2017) it will be possible to move forward the private reconstruction. Even if one of the criteria for the choose of these areas was the historical, architectural and landscape quality of the settlement, most of municipalities has detect as areas for the uniform reconstruction only the districts strongly damaged or completely destroyed.

[5] Agreement between the municipal administration of Arquata and the University of Architecture of Roma Tre for which Prof Michele Zampilli is the scientific manager (working group: Prof. C. Baggio; Prof. G. Cangi; Prof. M. Canciani; Prof. S. Converso; Prof. S. Ombuen; Prof.ssa E. Pallottino; Dott.ssa G. Brunori)

[6] *Thinning* is referred to the theory developed by Gustavo Giovannoni (Giovannoni, 1931) (Giovannoni, 1943), at the beginning of the 20th century, to resolve the issue of big cities' historical centers, like Rome, which urban fabric was so congested to represent an hygienic problem and an obstacle for the new circulation (two fundamental aspects for a city facing the modern era). Giovannoni proposed instead of the big demolitions, that risk erasing the urban memory of important city's portions, the controlled and punctual thinning, basing on the knowledge of the historical fabric and eliminating, preferably, the buildings added most recently. An interesting outcome of these theories is that of the studies of A. Giuffrè, and his collaborators, on Ortigia village. In this case thinning is proposed in order to simplify over-layered fabrics to improve their mechanical behavior and also to improve road-network with the creation of new exodus routes using the re-opening of the ancient systems of court-yard houses' open spaces (Giuffrè, 1993).

[7] The classification in safeguard degrees and the individuation of allowed interventions was made in collaboration with SAAD-UNICAM, the technical department of Arquata del Tronto municipality and the regional superintendence of cultural assets.

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Chelas Zone J revisited:
Urban morphology and change in a recovering neighbourhood

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Abstract

Among new council housing areas from 1960s Lisbon is the Chelas Valley, by then overwhelmingly agrarian. Although an integral urbanization plan - the Plano de Urbanização de Chelas (PUC) – was prepared until 1964, the area was divided into six zones, urbanized in different periods, with great deviances from the original plan.

Upon construction, Chelas was challenged by social problems. One of the zones, Zone J, has been particularly associated with this negative image. The architectural designs by Tomás Taveira and Victor Consiglieri introduced changes to the urban plan by Francisco Silva Dias and José Lobo de Carvalho. After construction, several municipal initiatives tried to improve living conditions in Zone J, ranging from façade changes to demolitions. All along, it has been accepted that the urban form of Zone J was a determinant factor of its failure as an habitat.

Here, we revisit the original Zone J Plan. How was it implemented, and how has it changed since? What has been the input of the residents in the territory they inhabit? Can it contribute to make Lisbon a more sustainable city? This presentation aims to answer these questions, while trying to identify parallels with other urban areas in crisis which share morphological characteristics with Chelas Zone J.

Introduction

For over forty years in Portugal, Chelas – Zone J has been synonymous with social housing gone wrong. Throughout the 1990s it was often on the news for poverty, violence and drug-trafficking. A feature film by Leonel Vieira, 'Zona J' (1998), portrayed those anathemas. Today, the situation has improved, and the neighbourhood is recovering.

Here, we highlight the conceptual roots and design of Chelas and of Zone J, disclosing the principles underlying the original plans, i.e., their 'ground-rules', as well as the transformations verified so far, establishing if and how they have been accommodated. For 'ground-rules' we mean rules governing physical elements of urban form, including grids, streets, squares, blocks, lots, buildings and façades (Marat-Mendes, 2002). This methodology is inspired by Marat-Mendes' (2002) research on sustainable urban form, and was elsewhere (Borges and Marat-Mendes, 2019) applied to first zone of Chelas, Zone I.

We also seek to promote new approaches to the territory responding to contemporary societal needs, such as housing demand and environmental concerns, which the project SPLACH -Spatial Planning for Change is researching, to improve urban food systems and contribute to de-carbonization.

Urban paradigms

In the early 20th century, Portugal was ruled by the New State (1933-1974), a conservative dictatorship. Its council housing programmes for Portuguese cities were initially low-density Garden City-inspired neighbourhoods. In 1930s and 1940s Lisbon, this proved insufficient, and slumlands continued growing (Teixeira, 1992).

Although urban planning efforts were only beginning – and only in larger settlements – the Lisbon Masterplan (1938-1948) by Étienne de Gröer was rejected by the Central State. Finished in 1959, a second plan was rejected by the municipality itself, leaving the growth of the capital city – particularly at its suburban areas – without a general framework for over 40 years.

In 1955, the Gabinete Técnico de Habitação (GTH), or 'Housing Technical Office' was created in Lisbon, comprising architects, urbanists, engineers and sociologists, and tasked with urbanizing the Lisbon Eastern end in three plans whose key goal was council housing: Olivais Norte (1955-1958), Olivais Sul (1955-1960) and Chelas (1960-1964).

This marks the transition to modernist paradigms, especially as defined in CIAM (Congrés Internacionaux d'Architecture Moderne). The Olivais plans take the Chartre d'Athénes as a model for high-density housing (Gonçalves et al, 2016), justified by pressures from the construction industry and the need to eliminate slums.

However, modernist paradigms would soon meet criticism within CIAM, particularly from Team 10, a group of younger radical architects who valued context and particular conditions instead of universal solutions (Borges, 2017). But critiques also emerged outside this circle. The 1953 International Union of Architects (UIA) Congress in Lisbon privileged debates on architectural modernity and tradition. In the late 1950s, the typological and historical researches of Italian architect Saverio Muratori, beyond contributing to modern urban morphology, informed the planning of State-led urbanization. In the 1960s, 'utopian' designs like those of Hungarian architect Yona Friedman, the collectives Archigram and Superstudio radicalize modern aspirations, depicting a world in transformations in mobility, construction technology, politics and economics. In the early 1970s, the environmental impact of such changes questioned the limits of urban growth (Moorcroft, 1972).

The Portuguese context was, in the early 1960s, deeply changed by the publication of 'Inquérito à Arquitectura Popular Portuguesa', a survey on autochthonous architecture (mostly rural), which prompted a Portuguese revision of modernism. This can be observed in the Portuguese participation at CIAM X, at Dubrovnik 1956 (organized by Team 10), with a project for a rural housing estate but also in the Zone I of Chelas (Borges and Marat-Mendes, 2019).

The following decades saw a duality emerge between a modernity that dialogued with vernacular tradition, as in the work of Álvaro Siza, and a rising postmodernism influenced by internationalization, consumerism and pop culture, as in the work of Tomás Taveira,

the architect of Zone J buildings (Consiglieri and Lopes, 1986). In the latter, new radical ideas would emerge, echoing foreign ideas, particularly after the 1974 Revolution, as is the case with Zone J.

The 'Plano de Urbanização de Chelas'

Until the 1960s, the Chelas area was a rural area with several agricultural fields, a system of valleys unattractive for the private sector as a development site. In 1959 the 'Plano de Urbanização de Chelas' (PUC) was allowed by the State. In 1960, José Rafael Botelho, chief-planner of Olivais Sul, joins Francisco Silva Dias and João Reis Machado to start the urbanization plan, following that of Olivais Sul: a cellular organization with housing areas on ridgetops, separated by green areas, and a service area on the centre (GTH, 1965).

However, two years later, these 'ground rules' are revised, and a new plan is started, now coordinated by Silva Dias, with Reis Machado, Alfredo Silva Gomes, Luís Vassalo Rosa and Carlos Worm. The Definitive Plan is finished in 1964 (Figure 1). Its 'ground-rules' are: linear distribution of equipment in ramified urban-life strips across housing areas; association of activities instead of zoning; and linked but detached motorways and walkways (GTH, 1965). The urban-life strips have 'ground-rules' of their own, namely high-density housing; commerce along pedestrian walkways; equipment for culture; points for nightlife; and services to provide links to the city (GTH, 1965).

The Definitive Plan also divided the territory of the Chelas Valley in six zones: I, J, L, M, N and O, each to be the object of detailed plans. As it was originally conceived (1960-1964), the PUC echoes other large-scale urban plans, including those critical of pre-WW2 CIAM. A sort of New Town in town (Heitor, 2001), Chelas was conceived similarly to Cluster City, close to Alison and Peter Smithson's (unbuilt) Golden Lane Cluster City (1953) and Hambourg Steilshoop (1961), Leslie Hugh Wilson's plan for Cumbernauld New Town (1957-1958) or Candilis-Josic-Wood's masterplan for Toulouse-Le-Mirail (1963-1973).

Unlike the earlier GTH plans, whose key reference had thirty years of development abroad, Chelas runs parallel to projects still under development and thus contains an experimental value highly surprising during a conservative and nationalist dictatorship. Despite radical social values they encapsulated, GTH plans were approved and implemented, most likely because authorities had little understanding of urbanism (Dias, 2019).

Zone J – from plan to construction

The detailed plan for Zone J was originally published in 1970 (Dias and Carvalho, 1970), but a rectified version was published 4 years later (Dias and Carvalho, 1974). Signed by Francisco Silva Dias and José A. Lobo de Carvalho, it was consciously planned as a city-building, i.e. an aggregation of different buildings with different functions within a unified structure (Dias, 2019). As a specific project, it echoes the radical architecture Reyner Banham (1976) would later synthesize as 'megastructure'. Among the canonic features Banham takes from Ralph Wilcoxon is that a megastructure is a 'structural framework into which smaller structural units (for example, rooms, houses, or small buildings of other sorts) can be built—or even "plugged-in" or "clipped-on" after having been prefabricated elsewhere' (Banham, 1976, p.8)

Indeed, Zone J could be described with Banham's (1976, p.168) idea of concentration in a megastructure, 'the heaping up in one place of all the social facilities of a city, and all the commercial ones as well'. The 'annus mirabilis' of mesgastructure was 1964 (Banham, 1976, p.70), which seems to have created enough precedents for this concept to be of interest for Portuguese planners. The 'stem' experience in Toulouse-Le-Mirail (1963-1973), a continuous structure with public activities linking housing slabs (Borges and Marat-Mendes, 2019), was also important (Dias,2019).

The detailed plan revised the indications of the PUC, towards greater capacity, achieving 2028 flats for 9126 people (Dias and Carvalho, 1974, p.8). The 'ground-rules' of Zone J (Figure 2) are: the zone is structured by a 'linear zone of intense urban life' formed by motorways and a continuous plateau concentrating equipment and services and

defining the morphology of the zone (Dias and Carvalho, 1974, p.9); from the centre to the periphery, buildings with lower density ramify (Dias and Carvalho, 1974, p.10); the whole system is linked by continuous decks, smaller on the periphery and larger in the centre and with equipment on the cusps (Dias and Carvalho, 1974, p.10); interior equipment within the central plateau which widens when descending to future Zone O to include a cinema, a parking silo and supermarkets (Dias and Carvalho, 1974; p.11).

The central plateau, extending over the ridgetop, defines the central street and two structuring squares and includes offices, services, commerce and flats for larger families. On top of these, slabs with deck-access flats are placed, and around each of the two squares is a set of towers (six on the north and three on the south). Despite the topographical conditions, all the elements are arranged either in orthogonal relation to one another, or under a 45-degree glitch, repeated throughout the megastructure.

Even conceptually, this resonates with the canonical definition of megastructure preferred by Banham, in the juxtaposition and 'plugging' of different pieces in a symbolically unified structure. It is very significant that the 'ground rules' of the GTH plan (and corresponding rules for the architectural competition) included deck-accesses, meant to allow pedestrian circulation throughout the whole megastructure.

The winning architectural proposal was led by architect Tomás Taveira with Victor Consiglieri, Madalena Peres and Antónia Pimenta. It confirmed the 'ground-rules' of the GTH but introduced changes (Figure 3). Taveira rejects the plateau, creates instead a double-slab (Figure 4) for the central block, with mixed-use larger slabs on the main street and parallel three storey slabs behind them, assuring the transition to the residential-only peripheral areas. This 'interior street' was expected to function as a meeting place for the community.

With the disappearance of the central plateau, the towers become only visually linked with the slabs. They have their own entrances and interior U-shaped decks are disconnected from outside elements.

Instead of integrating decks in the façades of the slabs, Taveira sometimes detaches them and thus gives them great visual weight in the façade design. Furthermore, both rectangular and circular windows are used (Figure 5), the latter reminding one of James Stirling's Southgate Estate (1967-1977) in Runcorn.

Many peripheral housing slabs by architect Victor Consiglieri, despite using some similar elements to Taveira's, are tower-blocks functionally detached from the megastructure.

Another independent tower-block in the southern area was afterwards designed by architect Aires Mateus. In the same area, a fourth tower by another architect was added. Both schools predicted in the plan were constructed, although the hospital in the northern area was not. The set of slabs designed by Taveira to articulate Zone J with the centre of the Chelas Valley (future Zone O) also remained unbuilt.

All the buildings were originally painted white (Figure 5), conceived as such by the GTH (Dias, 2019) for continuity with the earlier Zone I (north of Zone J), whose buildings were predominantly white (Borges and Marat-Mendes, 2019).

In 1998, invited by the municipality, Taveira designed a complex color-scheme of brash psychedelic colors, taking heed of façade elements (Figure 6). However, in 2003 this was interrupted and all towers and some slabs were repainted white. While many residents disliked Taveira's scheme, few wanted the buildings white again, preferring softer colors instead (Batista, 2003). Currently, Zone J presents a mix of all these color schemes: some are white (Figure 5), others have brash colors and others have soft pastel colors (Figure 7). Although in the past graffiti was regarded as vandalism, it has been reframed as a positive grassroots intervention, and many examples of urban art – some sanctioned by institutions – now mark Zone J public spaces.

In 2009, the municipality demolished 8 three-storey lots from the central interior street (Figure 8) known as 'death row', frequently used for drug-trade. Three years later, the space left open was filled with one small garden, one gymnastics circuit and the rest with parking space.

Changes in Zone J

The PUC was revised in the early 1980s and its 'ground-rules' deeply changed. Further zones would have conventional solutions – parallel streets with massive tower-blocks. This PUC revision also influenced interventions in zones already built.

From the start, Zone J was aggressively associated with problems related to poverty, unsafety and criminality, often associated with drug-commerce. Heitor (2001) in the late 1990s points out problems of vandalism. This prompted physical change, but a key aspect seldom mentioned is that, although Chelas was designed with a strong focus on social housing, it aimed at mixed communities. However, the first two neighbourhoods, Zone I and Zone J, were occupied after the 1974 Revolution by squatters from surrounding slums, from different ethnic origins and generally poor. Although the State eventually legitimized their housing situation, little efforts were mobilized towards integration in the general Lisbon social fabric. Spatial and physical changes often hoped to solve problems which despite having spatial and physical expression were of a fundamentally social nature.

Buildings designed by architects other than Taveira rejected the continuous deck-accesses becoming isolated from centre, but ensuring precise public-private separations. With the criminality problems spreading in the neighbourhood, many decks were enclosed, sometimes with gates at different access-points. Furthermore, deck-facing windows were added ironwork. Some balconies in towers and slabs were turned into marquees, while occasionally circular windows were replaced by rectangular windows. In some slabs, the parapet grid has been turned into a monolithic plan.

In the late 1980s and early 1990s the municipality sought to improve public spaces, mostly through tree plantation and pavement inception (DCH, 1994). The southern square had a plan by landscape-architect Maria João Ferreira (DCH, 1995). New tower-blocks were constructed, by the private-sector, in the western fringe of the neighbourhood.

In the mid-1990s, to fight social exclusion, the Lisbon Council replaced the Zone designation of Chelas neighbourhoods. Zone J became the Condado Neighbourhood (DCH, 1995), although many residents still use the old name.

More recently, architecture researchers have proposed solutions to make Zone J more similar with the 'conventional city' functioning, and to reduce management-costs for the municipality (Silva et al, 2011). These include demolition of staircases and partition of continuous decks, as well as a clear-cut segregation between housing and other functions, especially if above the ground-floor.

In 2019, the municipality demolished another of the lower slabs to eliminate a 'death row'-like situation in the northern area.

The northern area of Zone J was to receive a local hospital, never built. However, the idea was revived in 2008, now as the University Hospital, and a design by Pritzker laureate Eduardo Souto de Moura was ordered. The massive building (a contemporary megastructure?) ignores the morphological features of Zones J and I (standing between them) and proposes a new scale, morphology and aesthetic. It is a generic armored structure on the ground-floor (as if defending from the council estates) with several rectilinear slabs above it. It bears no relationship with the Chelas territory or its neighbourhoods and in a sense it confirms the worst expectations about megastructures, namely that are 'the perfect symbol of liberal-capitalist oppression' (Banham, 1976, p.209).

The vacant hospital plot had been appropriated by the community for informal agricultural gardens. These extend to adjacent lots, with productive plots of several dimensions around ruins of rural buildings. On the southern end, where housing slabs were not completed, vacant space also became agricultural space. In 2019, the council has cleared the hospital lots, and most of the agricultural gardens are gone or be soon. However, in the southern area, they show great fertility (Figure 9), mobilizing residents to clean and treat the land, ensuring its basic quality. At a time when sustainability concerns point out the many advantages of urban agriculture (Viljoen and Bohn, 2014), this grassroots appropriation is wise and requires legitimation and encouragement in the future.

The future of Zone J – a discussion

Considering the very distinct outlook proposed by the upcoming University Hospital, a serious consideration of the future of Zone J is in order. Must it eventually come down? Or should this neighbourhood be refurbished and valued?

Researchers have so far been unfavorable of its urban and architectural features (e.g. Heitor, 2001; Lopes, 2011; Silva et al, 2011; Silva, 2019). Here, they are hardly alone. Internationally, morphological solutions like those of Zone J have long been objects of contempt and even demolition, especially with social housing. However, there has been a recent shift in appreciation for precisely these architectural and urban solutions (e.g. Powers, 2010; Hatherley, 2010; Taylor, 2010; Boughton, 2018). This revision exposes the spatial determinism sometimes implicit in negative views of these neighbourhoods, ignoring the social and cultural conditions under which degradation emerged.

A 2015-2016 survey on Lisbon parishes reveals worrisome numbers about Marvila – the parish mostly constituted by the Chelas neighbourhoods, which according to the last Censos (2011) is:

a)   the parish with more people who cannot read nor write (2.371 people, followed by Olivais with 1.383) and less people with complete College degrees (RSL, 2016, p.32);

b)   the sixth parish with more school drop-outs (2,01% against the average 1,8%) (RSL, 2016, p.45);

c)   the second parish with more 'neither-not' youngsters, i.e. people between the age of 20 and 30 who do not work nor study, 26,73% (against the average 18,21) (RSL, 2016, p.46);

As of 2014 Marvila was the Lisbon parish with higher unemployment – 2525 people – and the second one with more people on social benefits (8%, double the Lisbon average) (RSL, 2016).

Zones urbanized prior to the Plan revision are morphologically different from the conventional city. But with extremely deprived social circumstances, must one expect a middle-class ambience? The enclosure of decks, for instance, expressing people's sense of unsafety, will probably better solved through a serious approach to the social reproduction of poverty than with their elimination or further enclosure.

Beyond dereliction, Zone J is a great example of experimental architecture. It may not please everyone, but that does not mean it is good for no one. Its unconventional urban solutions can withstand the reappraisal its international peers are undergoing, and its design has a concern for community that, while unfavorable to the market (Silva et al 2010) may prove favorable for other housing options, highly urgent considering the current Lisbon housing crisis, due not to shortage, but precisely to the market (Cocola-Gant, 2018).

Zone J is significant as a megastructure. Despite the worst fears of post-1968 politics, megastructures have different meanings in different contexts. True, they may symbolize 'liberal-capitalist oppression', as with the forthcoming University Hospital, but may also symbolize a breakaway from conventional morphologies which, providing clear-cut separations, do not challenge the ways in which, in spatial terms, we live our lives and relate to our community. The Zone J 'city-building' was to have cinema and supermarkets, at a time when conventional neighbourhoods had only churches and schools. It offered what the New State withheld and what democracy never delivered – at least to these communities.

Despite its complex and detailed architectural design, Zone J has accommodated change and neither façade changes nor the 'death-row' demolition eliminated the neighbourhood's coherence. Although the psychedelic color-scheme did not please residents 20 years ago, its remains are now sometimes celebrated as a pop aesthetic, for instance in the videoclip Blaya's "Faz gostoso" (2018), a widely popular song (nearly 36 000 000 YouTube views) recently covered by Madonna.

However, the flexibility displayed by the Zone J morphologu may continue to accommodate changes, which, in spatial terms, must be negotiated with the living community while also being sensible to architectural features whose historical importance is yet to be understood. Further changes would mostly benefit from considering the

territory, instead of focusing on architectural details. This would allow political power to negotiate with grassroots initiative. A robust strategy for promoting urban agriculture could improve the quality of soil and public space, create labour and contribute to the sustainability of Chelas and of Lisbon in general, improving living conditions in Zone J not by destruction but through a constructive approach.

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Acknowledgements

Figure 1. Definitive PUC in Lisbon context. Source: adapted from GTH, 1965.

Housing

Commerce, equipment and offices

Urban green spaces

Industrial spaces
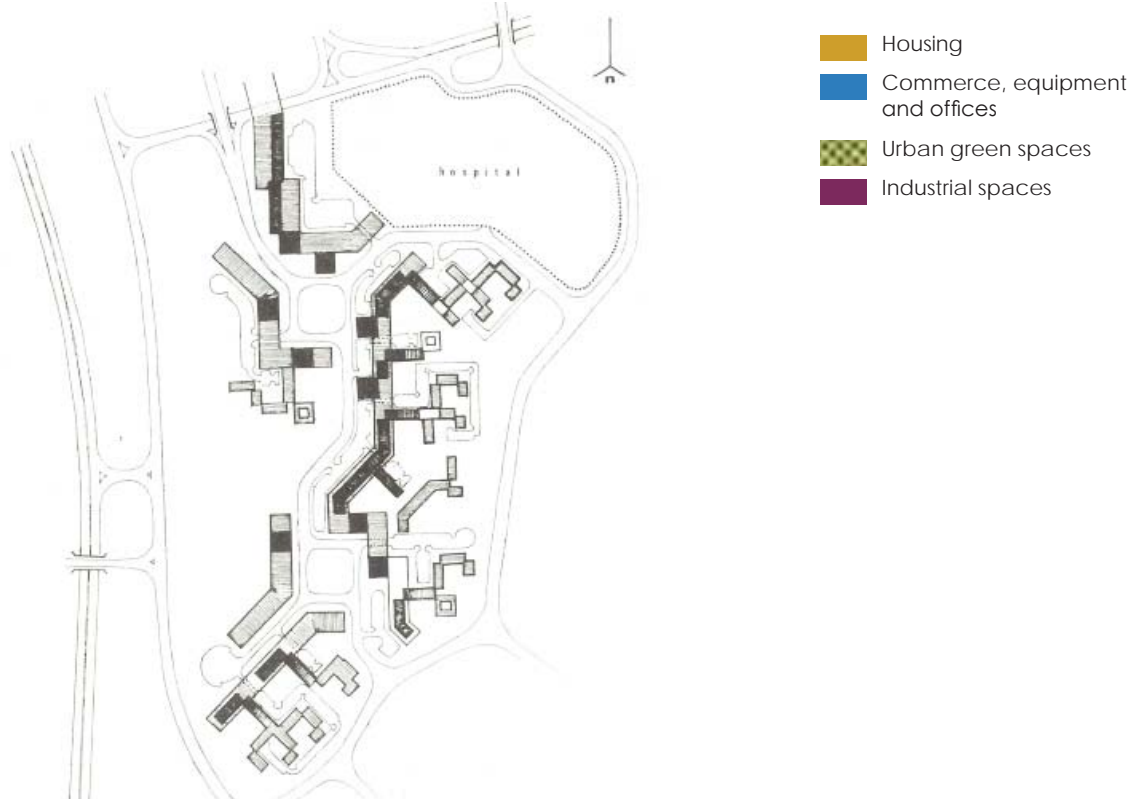
Figure 2. Zone J urban plan. Source: Dias and Carvalho, 1974, p.12.

Slabes and towers Central plateau Structuring squares Secondary public places Roads

Figure 3. Changes from urban to architectural design. Source: authors.

Housing Commerce, equipment and offices
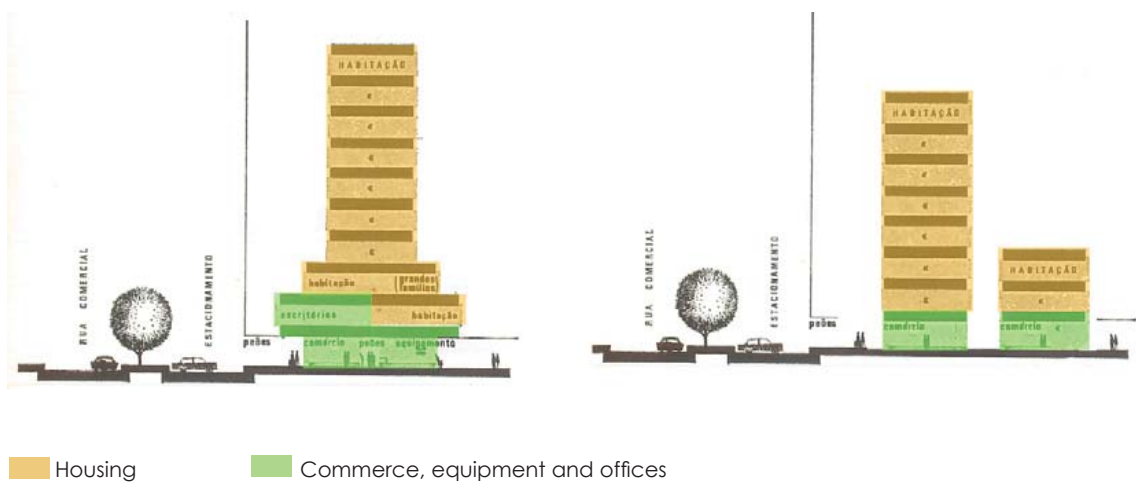
Figure 4. Central axis in the urban plan vs. the architectural design. Source: adapted from Dias and Carvalho, 197.

Figure 5. Zone J slab. Photo source: JCB; **Figure 6.**New color-scheme. Source: PT DGPC: SIPA FOTO. 00899169, Ferreira, T., 2010.

Figure 7. Most recent slab color-scheme. Photo source: JCB.

Figure 8. 'Death-row'. Photo source: https://vivermarvila.blogs.sapo.pt/3735.html;
Figure 9. Southern agricultural allotments. Photo source: JCB.

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The Campidanese House and its housing typology.
Studies and strategies for an integrated recovery of Sardinian historical centres.

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Keywords: *courtyard house, raw earth, sardinia, rural morphology*

Abstract

Sardinia, the second largest island in the Mediterranean, is the Italian region with the largest number of historical centres built on raw earth. As a result of the modernization of society and new construction methods, the vernacular architecture of this beautiful island is gradually disappearing: over the years, the negligence of the municipalities combined with a lack of awareness of the heritage on the part of the inhabitants, have destroyed entire testimonies of an architecture that has lived for centuries and has been an integral part of the social life of the population. The Campidanese House is the symbol par excellence.

To definitively lose this heritage of historical and testimonial value is unthinkable.

The aim of this work is to define a methodology that focuses on a strategy of intervention aimed at the recovery of this heritage. This starting from a careful analysis of the general themes of the building culture of the earthen architecture, defining the peculiar building characteristics of Sardinia, divided into five macro areas. Subsequently, and for each area, the fabrics of the most relevant historical centres were studied, as well as their morphological characteristics linked to the type of building and its variations. In order to achieve a targeted intervention strategy, the analysis material has been reworked in various actions and projects, in particular on the case study of the city of Quartu Sant'Elena, the second largest city in Sardinia, which boasts the largest historical centre built in raw earth on the island.

Introduction

Before we can talk about the housing typology of the Campidanese House, two important premises are necessary: the first is linked to the geomorphology of Sardinia and the construction technique of raw earth, the second is inherent to the socio-cultural context that gave birth to this typology.

Raw earth: a poor building material that has always been used by man, since the birth of the first cities (Jericho, Harappa, Catal Uyuk, Mohenjo-daro, are just some of the ancient examples of this construction technique). Raw earth, as a matter, offers infinite possibilities of application and is well connected to the modern principles of eco-sustainability, not only environmental, but of the built - the high thermal comfort is due to the consistent mass that allows low dispersion in winter, and good isolation in summer, the breathability of raw earth facilitates the regulation of internal humidity, avoiding the excesses of both dry and humid air - and the disposal of "buildings" if they are demolished. In fact, there is no need for special measures during the disposal phase, a building made of raw earth - its rubble - can be almost completely reused through a selection of granulometries of the same material, which will then be put back in place according to the same techniques of raw earth construction.

Today it is built in raw earth all over the world, from ziqqurats in Syria to mosques in Mali, from monuments in Nigeria to buildings in Yemen, from houses in New Mexico to urban aggregates in Morocco, even in territories that may not seem suitable for this material (areas that are notoriously rainy like Germany, France and England boast a considerable rural heritage in raw earth); this is because all the " earths" are suitable for construction if wisely used. Man, over the centuries, has thus perfected construction techniques by making the best use of the matters at his disposal, whether it be richer in clay, silt or gravel; this is how CraTerre (World Association that deals with raw earth in association with the School of Architecture of the city of Grenoble) has catalogued the different " earths" and construction techniques for which they are best suited: we will thus obtain that in Africa construction is carried out using the Pisè technique - walls built by means of wooden formworks on which the mixture of earth, straw and water is poured, then beaten by mechanical or manual pestles - in Northern Europe the Torquis is used - made with wooden frames on which " twisters" of earth are wrapped - or the most widely used Adobe, spread all over the world - bricks formed with soft dough arranged in sun-dried wooden reinforcements, which are then placed to form masonry through the laying of binder made with the same mixture. It is precisely this last construction technique - Adobe - that provides the backdrop for the case study: the housing typology of the Sardinian Campidanese house. Through a first investigation into the geomorphology of Sardinia, it was possible to identify what were the so-called "raw earth territories", that is, those places affected by the different types and construction techniques that then outlined different characteristics of the construction according to their location on the island. Sardinia can then be divided into two fundamental macro-groups: the Geographies of Construction Systems in Raw Earth - in the centre and south - and the Geographies of Building Systems in Stone and Brick - mainly in the north. The Geographies of Construction Systems in Raw Earth - visible in Fig.1 and marked mainly with the colour orange - are those territories affected by deposits in the Continental Area - Holocene and Pleistocene - and wind, lake and coastal sediments. All this is quite obvious since it is precisely these deposits and sediments that create the "earth" with which adobe - a sun-dried raw earth brick - rich in clay, silt and gravel, fundamental parts of the "inert" that constitutes the very mixture of the "ladiri" (from the Latin "later" - brick - is the name in Sardinian to indicate adobe), with different grain sizes and percentages depending on where the earth is taken from. The areas north of the island are instead affected by different types of buildings, mainly made of stone quarried from the large basaltic and granitoid complexes, raw materials therefore more readily available to the rural population of Sardinia, which has built its monumental nuragic complexes - the Nuraghe Losa, the Nuraghe Santu Antine or the Nuragic Complex of Barumini are some of the largest nuragic complexes among the more than 7000 present on the island - with megalithic blocks of basalt that still compares on a par with the splendid landscape in which it is set.

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URBAN SUBSTRATA | Morphological legacies
& | and
CITY REGENERATION | design tools

In order to put into practice a new model of recovery of the existing one, with reference to a series of complex factors and phenomena, which cannot be traced back only to the constructive-typical elements of the single architectural building and its construction technique, it is necessary to read the housing heritage in its entirety, in its similarities as well as in its differences, in order to understand the extraordinary cultural, historical and identity value of the Campidano territory. In order to do this, it is essential to understand first of all how the typology of the Campidanese House was born. The housing typology of this house, considered in its widest meaning and not in the most specific classification, is a unique model of its kind. It brings with it references to the Roman domus, to the Mediterranean Arab houses, but it represents a case in itself; the courtyard house is the social symbol of a peasant Sardinia, of living together, and is the result of how, over the years, cities have come to be defined through a complex system of land use, with collective rules of places, ways and phases of work, agricultural and pastoral. The inhabitants of the cities ("Bidda" in Sardinian, from "villa") have always been theoretically self-sufficient individuals, both from a productive and "housing", legal and administrative point of view, organized according to a well-defined and delineated social hierarchy:

• "Su Meri" or "Proprietarius Mannu", in smaller numbers, were the householders with an abundance of their own means of production (land, animals and tools), who therefore needed helpers and servants;

• Small and medium farmers or autonomous shepherds, we could define it as the "middle class", that is those who were neither at the service of the big owners, nor had such vast estates that they had labourers or helpers under them;

• "Zeraccos" or "Serbidoris", represent a large number of families without or few means of production of their own that go to the service of the big owners;

"Meri" and "Serbidoris" both live within the same farm house, each according to their own spaces and tasks. And it is precisely in this context that the house is the symbol of the well-defined social stratification between subordinates and dominants, as well as the way of living is a typically local way of relating to each other as social figures; without such social organization linked to the territory, cereal production, wine, oil - all activities that required large spaces for the storage of finished products - but also to sheep-farming and breeding, there would not exist this type of housing, created to meet the specific needs of the community.

This happened in the past in Sardinia, but today what are the dynamics that have led to the abandonment of such settlement models?

After the Second World War there was a massive abandonment of the production sector of historical building materials (Raw Earth); this was mainly due to a change in the social status of the population: it went from a "peasant" population to a " labourer" population (to cope with a deeply depressed economy large industrial sectors had been installed throughout the island). Therefore, continuing to live in houses made of raw earth, on one floor, with typically rural features, no longer reflected the social achievements obtained by the population. Since the same years there has been a slow but inexorable typological transformation of Campidanese houses - divisions, elevations, duplication and clogging - so much so that today in many of Sardinia's historical centres it is now impossible to recognise them in the context of the fabric of the city.

Over time, the magisterium and traditional building practices have disappeared, as well as a deep crisis in the design culture of the new city expansions - which has not been able to maintain the deep historical-critical awareness that has always existed in the world of traditional building - has produced architectural artefacts of poor quality and lack of attention to the context in which they were inserted. The new models of consumption and building production end up distorting the historical centres, modifying not only the external "facades", but above all the urban and residential form. In the 80s and 90s there was a first rediscovery of the themes of the Sardinian "local" tradition, through the studies and research carried out by the Universities of the island, which mapped, catalogued and classified the traditional typological characteristics of the architecture of the historical-rural centres - and not only - of Sardinia. (Fig.2)

Reading of the territory, tissues and basic aggregative systems

Taking into consideration the historical duality of approach to construction, we went down in detail to codify which were the characteristic settlement patterns of the raw earth territories rather than those in stone and brick:

- • STONE AND BRICK

This includes all the central-northern Sardinian territories (especially the districts of Nuoro and Sassari); here the city is often built and arranged following the orography of the terrain, with dwellings that often develop in height - thanks to the mechanical characteristics of the material itself. For simplicity we will divide these territories into two distinct models:

- NORTHERN SETTLEMENT MODEL

(Areas between Sassari, Olbia, Alghero and Porto Torres) The urban landscape is dominated by the large street-square and public space. The house is the elementary cell that aligns itself along public paths and uses them as its own external projection in the absence of private open spaces. The settlement model appears so closely influenced by the example of the urban structures of the Italian Middle Ages - matrix paths and terraced plots.

The result of these models is an extrovert urban landscape, regulated by the windowed view of the inhabited fronts over public space, with a linear arrangement of mostly elongated and narrow blocks, with a width of two or three building cells;

- MOUNTAIN SETTLEMENT MODEL

(Areas included in the District of Nuoro, within the Gennargentu Mountain Complex) The heart of the central mountain is structured according to different settlement cultures and equidistant from the northern and southern models. In the centres on the slope the "third dimension" is the predominant factor and the building cell is an element of terraced construction of the living space. The house is, also in this case, elementary because the economy of space and resources is extreme, the soil is contended with the slope and public space is reduced to a very narrow path between the dwellings.

This creates a dispersed urban landscape, which rarely has the unity of a village, but more often the unity of the neighbourhood returns a natural and disorderly image of the settlement, with the housing cells arranged according to family clans rather than according to community solidarity;

- • RAW EARTH

Widespread in general throughout southern Sardinia, especially in the territories of the Campidano Plain, they are characterized by buildings made of raw earth, which reflect in the fabrics and in the basic housing form the socio-economic morphology to which they are subject. They are cereal-growing territories and the Campidanese Courtyard House (as a unique model) not only performs a housing function, but more properly a house-farm. In each area, moreover, different "forms" of Campidanese House are specialized, each with its own peculiarities, while maintaining the general canons thanks to the presence of fixed elements such as the courtyard, the loggia facing south-east (sa "lolla"), the enclosure and sometimes even the well. Also in this case we have two very precise models of settlement, which arise from the layout of the house inside the plot:

- SOUTHERN SETTLEMENT MODEL

(The whole area to the south of the island, from coast to coast up to the north with the Province of Oristano) The courtyard fabrics of the cereal-growing centres of lower Campidano, with the housing cells oriented towards the south, are realized lie like medinas, urban labyrinths with the grid of narrow, walled streets. The alleys separate the buildings and the layout of the house is introverted into the enclosure, with the patio that regulates the bio-climate of the house itself.

The public space in this case is reduced to a minimum and sociality is achieved in the private and domestic sphere of the court, which is the real space of relationship between the private dimension and community relations. The result this time is an introverted urban landscape, with large blocks with a blind perimeter and full of high walls, often broken only by access portals and cut by alleys that also house three or four internal alignments of courtyard houses;

- THE ORISTANESE CAMPIDAN EXCEPTION
(Area included in the Oristano district) Oristano is located in the central-western part of the island and it is the area where the interaction between the settlement cultures is particularly sensitive; equidistant from all three models (north, south and mountain) here is the mixed urban landscape, made of fabrics of "extrovert" (or "backward courtyard") courtyard houses that combine the connotation of the northern public space with the private and familiar character of the south.

The Oristano "house with hall" defines an extremely rich transition on a cultural and settlement level, which draws on the Tirso Valley urban landscapes that make the hall the real border between public and private.

From this analysis it was decided to subdivide the Geographies of Construction Systems in Raw Earth into 5 territorial areas, each with its own typological characteristics and settlement models (Fig.3):
    - Campidano di Oristano, "House with back courtyard and hall";
    - Cixerri, "House with back courtyard and development on two levels";
    - Campidano Centrale, "House with double courtyard";
    - Sarrabus, " House with front or double courtyard";
    - Campidano di Cagliari, " House with courtyard in front";

From these subdivisions and a careful analysis, not only of the individual architectural characteristics of the house itself, but above all of how they "aggregated" to form the urban fabric of Sardinian cities, we have come to the definition of three categories of housing arrangement within the lot - courtyard behind (house with hall), double courtyard and courtyard in front. (Fig.1)

The northern Campidano and the Cixerri: " Street - Hall - House - Court".
The houses of the northern Campidano, in the universe of the court houses, constitute a typological anomaly, a subtype with a mainly backward court; the houses of the centres of Oristano are in fact almost exclusively facing the street and it is the street, and no longer the courtyard, that becomes the seat of social relations, a habit that, moreover, is still in use today. The morpho-typical relationship between public urban spaces and private property, and which defines the structure of the fabric in the inhabited centres of the northern Campidano, is transformed into a street-house-court, giving rise to a strongly hierarchical road structure:
    • MAIN ROUTES: the sense of the building prevails over the void, it is no longer the boundary wall, but the residential volume that becomes the element that dominates the roadway;
    • SECOND ROUTES: often alleys, are necessary to ensure vehicular access to the courtyards behind. The boundary wall resumes being the architectural and formal figure that draws the urban landscape;
The residential building becomes the element of mediation and permeability between the street and the courtyard behind it, and a very special room, the "hall", constitutes - as it happens for the loggia in the houses of the central-southern Campidano - the fulcrum of the distributive and functional concept of the Oristano's home. The room defines the type of house of the Northern Campidani: it is the entrance room into which the others are entered; it is the largest of all and is the only one that communicates not only with the street but also directly or indirectly with the back courtyard.

The house is different from the houses of the southern plains in terms of relations with the courtyard and the street, the internal distribution, the size and development in height:

- the planimetric layout is generally symmetrical, the building body is at least twice, and often even three times thick. The hall is arranged according to the axis of symmetry orthogonal to the street and is the distribution sorting room of the entire house. Usually on both sides of the room opens a couple of rooms used as a representation room and parents' bedroom, those with direct access to the street are the bedrooms and storage rooms the internal ones; in addition, a third row of service rooms, including the kitchen, closes the planimetric distribution at the back overlooking the courtyard;

- the architecture of the northern Campidano has a predominantly horizontal character; the houses, as a rule, are developed on one level only, presenting the two levels only on a limited number of rooms assuming an asymmetrical street front quite common and typical in almost all the centers of Oristano north of the Tirso;

Although the court is more isolated from public space, it is considered exclusively as a working space, and in this way it loses the centrality that it represents in the south. (Fig.3)

The Central Campidano and the Sarrabus: " Street - Court - Home - Court"

The house of the southern central Campidano is in general a medium-large size house and preserves almost everywhere a character that strongly represents its direct link with the rural world. It is a housing model generally with a double courtyard, even in cases of small and minimal residences, which reaches a very high degree of distribution articulation and functional specialization. The fundamental elements in this case are: the double courtyard, the loggia and the portal.

- The double courtyard allows for a double overlook and consequently also a double thickness of the body of the building: the front courtyard has a more civic use and plays a central role in domestic spaces and activities; the back courtyard has a more rural character, there are placed the instrumental outbuildings, stables and sheds for the shelter of livestock;

- The loggia is the distributive element through which it is possible to access all the rooms on the ground and upper floors. The loggia expresses the relationship between the house and the place, is a sign of the identity of the culture of living in the Campidano and highlights the care that once lent itself to the specific climatic conditions of the settlements. It helps to restore the bioclimatic balance of the house, shielding the rooms from the summer heat and limiting heat loss in winter. The loggia is usually exposed to the south and its width varies from a minimum of 2 meters to a maximum of 3 even 4 meters;

- The access portal to the courtyard is usually placed frontally or laterally; it is a singular element of the architecture of the courtyard type: it is the only point where the continuity of the " enclosure" is interrupted, which makes the courtyard an introverted and invisible space outside, thus representing the projection of the house on the street. The only architectural element of permeability, the portal takes on a very special symbolic value and becomes a distinctive sign of the house;

The house of the Sarrabus is also a single or double courtyard, medium-large size. Also in this portion of the regional territory, there are the elements that define the courtyard type: the loggia, the portal, the distribution organization of the variously specialized buildings around the fence, the prevalent horizontal development of the building. In this case there is a greater rural connotation with the strong presence of archaisms in the building languages. (Fig.3)

The Campidano of Cagliari: " Street - Court - Loggia - House"

In the southern Campidano and in particular in the towns closer to the Cagliari area, the building density increases compared to rural areas, responding to a higher degree of planning; the typological model of the courtyard house of it is thus spread as a necessary reduction of the double courtyard model - there is no longer the space needed to afford two courtyards, the building density increases. The house is located at the end of the lot and keeps the south or south-east view of the courtyard, located between the building and the public pathway, between which there is always the high separating wall.

The articulation of the house, however, does not differ from the double courtyard house, with which it shares most of the elements structuring the type: the loggia, the

portal, the distribution structure, the development in height, the fence, etc..

The courtyard, being always south oriented, generates different views of the street, thus creating fabrics in opposing plots.

The connection between the courtyard and the road is also ensured in this case by the only opening of the fence in which the access portal is located; however, with subsequent changes over time, it is often also possible to find a small entrance door directly to the house, without passing through the courtyard and therefore the large portal - this occurs only in the case of layout of the building on the north side of the plot.

The arrangement of the plot with respect to the street, in fact, binds the position of the entrance to the courtyard and involves two different typological variants:
- the house with direct access to the courtyard (side or front);
- the house with access from the north, where the passage to the courtyard crosses the residential building changing its distribution;

The house is usually developed in a simple, only rarely double, building body consisting of two or more cells aligned along the northern side of the plot, on one or two floors.

In the centres close to the urban area of Cagliari, the rural bourgeoisie establishes itself as the dominant class, while a good number of medium and large court houses in centres like Pirri, Quartu Sant'Elena and Monserrato, belong to rich families of landowners from Cagliari, who spend only a few periods of the year in these houses - during the cereal harvest or the grape harvest for example - or live permanently in these large farmhouses in order to be able to better control their possessions and their workers.

The compactness of the settlement, the logic of the enclosure that defines the building scale, the wall as an exclusive structural element, the wooden warp roofs with brick roofing tiles and a system of minimum openings that reduce the relationship between private and public space, highlight the common features of living in the Campidani plains, which has introversion as its main cultural matrix. (Fig.3)

Identification of an Intervention Strategy. Case Study

Quartu Sant'Elena, a city on the coast of the Gulf of Cagliari with 70,925 inhabitants, is the third largest city in terms of population, after Cagliari and Sassari, in the whole island, with a historical centre of about 56 ha. The city - and its historical centre - has always been a territorial garrison as far as cereal and wine production in the area of Cagliari is concerned. It underwent major changes during the second half of the 20th century; here was born the model of the purest Campidanese house - in its forms - with valuable typological, technical and architectural features. It is precisely for this reason that it was chosen as an example for the case study, to which the modern principles of "modulation of protection" should be applied: in line with the principles established at the time by the Gubbio Charter (1960), it is based on a scrupulous critical historical reading of the historic centre, which aims to avoid its "freezing". Therefore, do not consider the heritage as an object that must exist over time unchanged in its form or function, but as an urban witness able to be transformed, in line with the new housing, social and cultural needs in place. It is expressed through a set of rules of "good practice" that provides for the maintenance, restoration and conservation of that part of the historical building heritage that has remained unchanged over time, but at the same time allows the controlled transformation of those buildings of the minor heritage that have been subject to significant transformations, already in the past, so that today they have only an "urban footprint" value.

The classification of buildings and areas, together with the normative apparatus, based on groupings of categories of intervention and uses allowed, constitute the core of the modulation of protection.

Through a new recovery model - inspired by the very interesting studies carried out by the "Versus - Heritage for Tomorrow - Vernacular Knowledge for Sustainable Architecture" an important international research attempt with the main objective of acquiring knowledge from the fundamental principles of sustainability learned from the vernacular heritage to explore new methods/ways of applying these principles in modern sustainable architecture - we try to place the Campidanese House at the centre

of every initiative as a symbol of union between social-cultural-economic-environmental aspects, as it has always been in the past. In line with these principles, collecting the long work of morphological analysis and carrying out an investigation into the criticality and potential of the case study itself, we then came to the real recovery strategy for the historic centre of Quartu Sant'Elena. It is composed of three main project "layers" that put the fundamental basis for a design that goes down to the architectural definition.

The mobility plan, which in the perspective of a general redesign of urban mobility - with the aim of reversing the trend towards more sustainable models - moves the public transport circulars outside and inserts electric microbuses inside; the establishment of a "ZTL" (Limited Traffic Zone) and the pedestrianization of the entire historic center by time steps, will free the area from cars and give it back the character of 'neighborhood' typical of its urban structure. The Public Works Plan, on the other hand, aims to respond to the primary need of 'attraction'; in order to strengthen the role of urban centrality, new services and cultural activities are planned that are currently absent throughout the city (cinemas, theatres, exhibition spaces, co-working spaces, libraries and reading rooms, etc.) and the strengthening of existing ones. In this way, the Historic Center will have the opportunity to transform itself from a simple place of passage to the hub of urban energy and the nucleus of life. Finally, the Modulation of Protection: after the real estate crisis of 2008, which led to a widespread stop in urban growth, urban planning policies have for the first time the opportunity and the task of revitalizing the historical heritage. (Fig.4)

Conclusions

In this specific case, the aim was to approach a very specific and historical-documentary value reality, a historical centre in the South of Sardinia, Quartu Sant'Elena, applying to it the tested criteria of protection modulation. Raw earth is a poor material that is very sustainable, energetically productive and therefore convenient. It is linked to a particular way of building the city that makes the historical raw earth centres unique and, in a certain sense, not repeatable. Their protection is therefore possible through the definition of integrated policies of recovery, enhancement, and therefore also possible transformation, which preserve their characteristics and at the same time make them adaptable to the needs of contemporary life.

A historical center, raw or not, is a resource of unlimited value from which the contemporary city can be reborn.
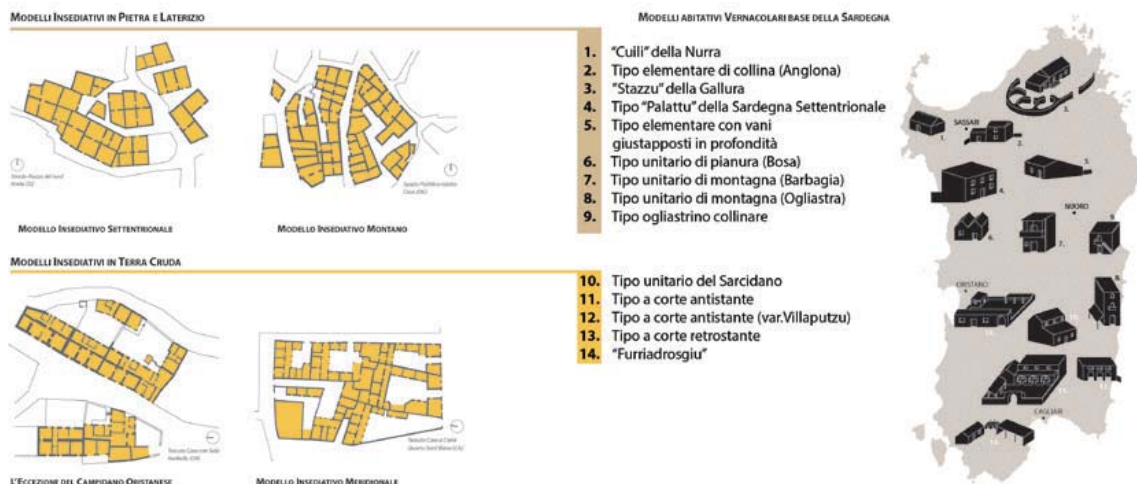
Figure 1. Reading of the territory, tissues and basic aggregative systems.
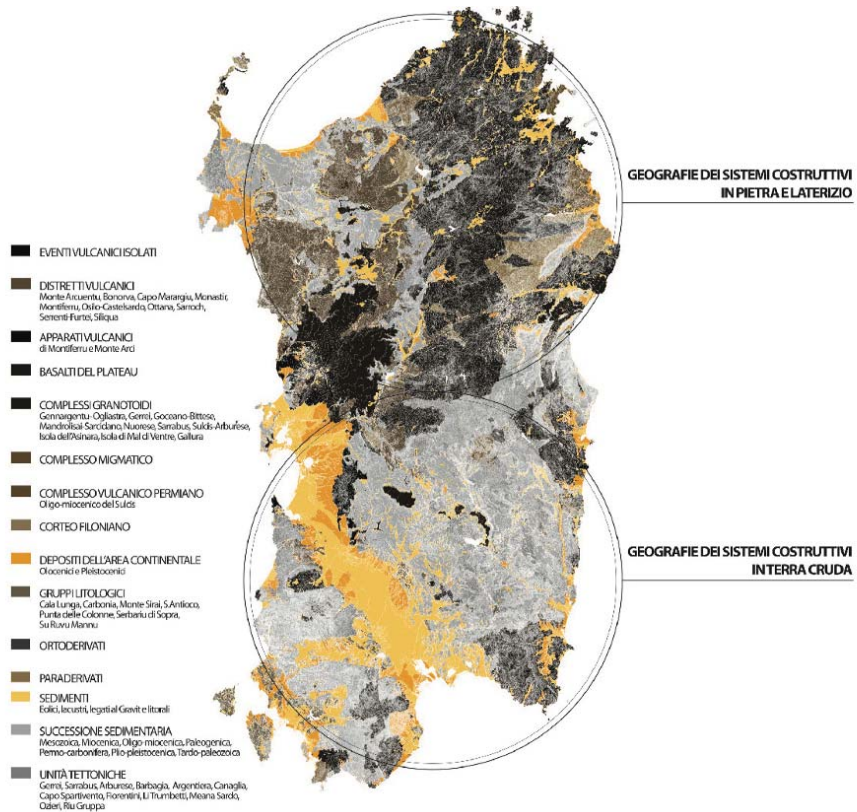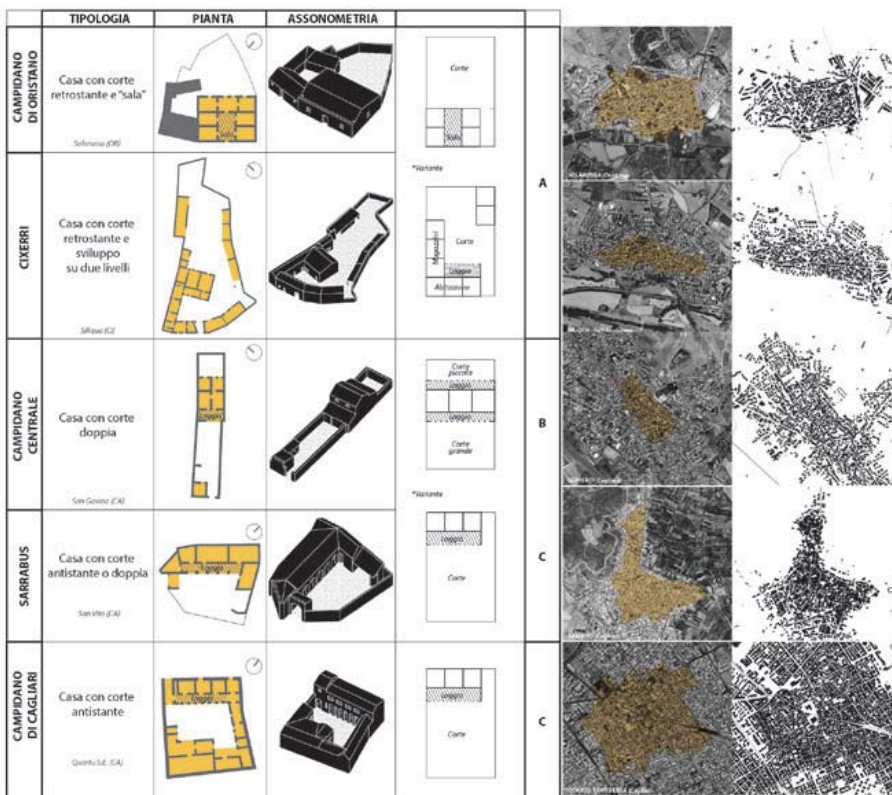
Figure 2. The territories of the raw earth, housing patterns and fabrics of the campidani court types
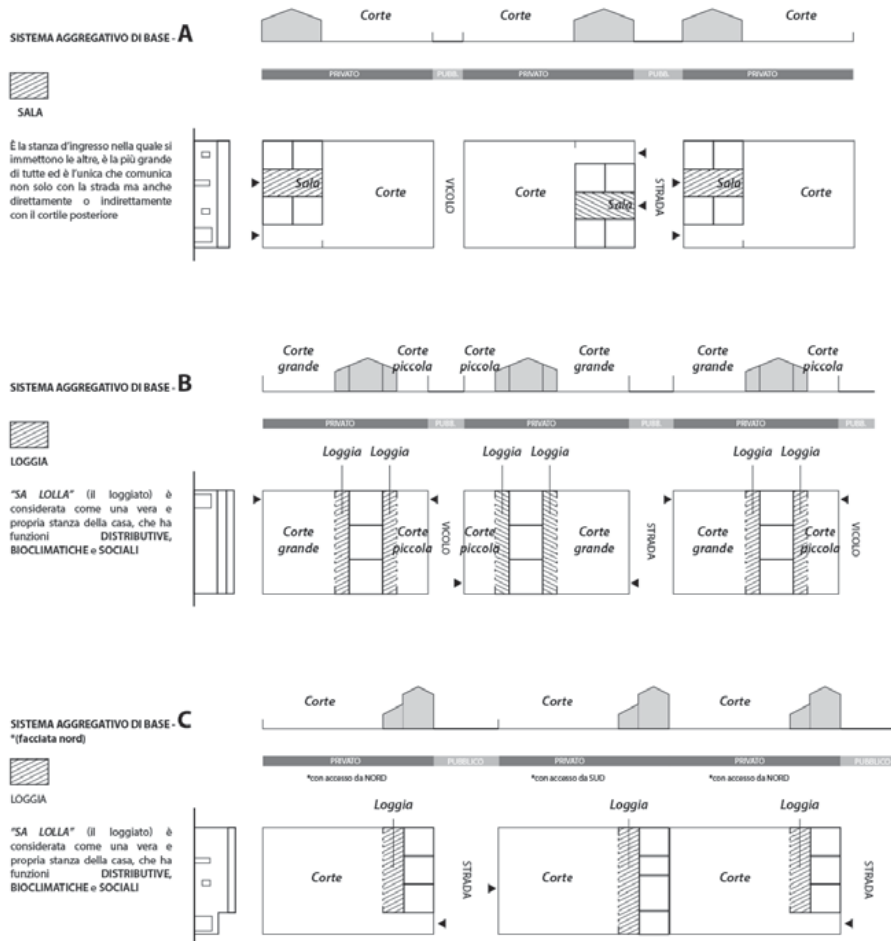
Figure 3. Reading of aggregative systems.

Figure 4. Project strategy fragment on the case study.

URBAN SUBSTRATA | Morphological legacies
& | and
CITY REGENERATION | design tools

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The square on city walls. Design and memory

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Abstract

The contemporary project often has to deal with the regeneration of the central open spaces of a city characterized by an important stratification of urban fabrics from different eras. Particularly in areas characterized by the proximity between the medieval fabric and expansion outside the walls, the following urban transformations are numerous and frequent.

Today, the same areas are at the centre of important urban regeneration projects that aim to adapt them functionally to the new urban mobility plans as well as to reinterpret them with respect to greater public usability. In the project, there is the knot of memory, that is the will to recover old and new traces of these places often hidden by road plans that can represent chances of formal interpretation of the spaces themselves.

The theme in the paper will also be explored through the applied case of the urban regeneration of Piazza XX Settembre in Bitonto, in the metropolitan area of Bari in Puglia, where the basement remains of the Angevin walls are overlaid the expanding nineteenth-century fabric until the presence of architectural works from the Fascist period, later demolished. What signs must re-emerge in the new project? How to shape the memory in the new face of public space? The application for funding for a redevelopment project on the said area represents an opportunity to contribute with a specific case to the critical discussion on the advanced issue.

Design and memory

The town building is one of the key themes of modernity, which has always opened debates on the relationship between old and new in architecture, on the lawfulness of contemporary language as an instrument of dialogue with urban and architectural pre-existences, adapting them to the changing needs of the city. A theme that finds its foundation in the concrete work driven by environmental, historical and civil needs. How does the new relate to the old and how can the old be taken as a reference for the modern? The contemporary project in the ancient context is a dialogue, reflection, measure and cultural interrelations between places, spaces, architectural structures that can only be governed by the architectural design. In the urban space, the identity of the city is given to specific configurations of the space that aim to govern the urban dynamics called to interpret change. Emblematic is the spatial figure of the walls, a territorial element strongly characterizing the urban fabric, the topographical and landscape configuration, the environmental value of a context. Between the second half of the nineteenth century and the early twentieth century, the fortifications had lost their defensive or control function and were mostly altered or demolished, mainly in order to allow urban expansion and facilitate vehicular traffic. Initially there were opened wide gates to contact with the expanding fabric, in an increasingly lively dialogue so as to regularize entire stretches, fill the ditches and redesign the edge spaces. In the second half of the twentieth century, the renewed attention towards the walled core led towards a deep rethinking of the 'old - new connection' through three main design guidelines that have given us the face of the cities as we live and study them today. These are: demolition/reconfiguration of the structures that obstruct the road connection; substitution/replacement/overlapping of new building units; reconfiguration of the spaces close to the core intra moenia (Dicarlo, 2005). From an element of strong identity and orientation in the urban fabric, the walls gradually become a resilient monument, variously interpreted and altered in response to the changing needs of the contemporary world. They become the characters of important transformations that heavily condition its image and memory. They become a sign no longer unitary but fragmentary for demolitions and wide open gates to allow urban expansion, a border no longer unconquerable but inhabited to cope with demographic pressure, a front no longer unassailable but an architectural backdrop to contain the modern road system and traffic flows, a limit no longer clear and strong but hidden and buried by successive historical stratifications.

Case study: Bitonto

The fortification is connatural to the settlement, it defines its perimeter, it follows its destiny and transformations and has always represented the most incisive element on the city image. The formal role of the walls was, therefore, decisive both in the case of inshore cities, with their characteristic peninsular layout, and in the inland centres where the urban perimeter took on a more enveloping character (Massarelli, 2005). Bitonto, an applied case of the this study, according to this second approach, was equipped with a mighty fortified wall with twenty-eight towers[1] and five urban gates (Baresana, Maja, Pendile, Robustina and Nova) that closed the oldest core with a polylinear ribbon and strongly influenced by the particular relationship with the natural element of Lama Balice. In its completed form, the defensive structure is Norman (Pasculli, 1962; Mongiello, 1970).

The advent of the Angevins led to the restoration of some curtains, the rebuilding of the Robustina and Pendile gates and the insertion of the so-called 'castles', cylindrical towers high on a short scarp, with crenellated overhanging crowning and, from a certain height, covered with panelled ashlars. In the 15th century the progressive change in warfare techniques made it necessary to adapt the walls to the defence and offensive system with a colossal fortification carried out in 1601[2] . The new bastioned walls were much thicker than the old ones, with a strongly scarped outer face: the so-called 'Trione', a polygonal base fort with lanceolate antemural erected at the change of direction between the curtains of the eastern end of the ancient city, was added to the bastions and ramparts (Borri, 2003; Castellano, 1993).

In the light of the historiographical knowledge and the remains that survive, today we

can document an articulated and powerful fortified wall where the regularity of the six-teenth and seventeenth century curtains can be seen on the flat E, NE and NW[3] slopes less influenced by the orographic features, was contrasted by the compositional variety of the medieval walls, which instead conveniently take advantage of the accidentality of the S, SW and W slopes overlooking the Tiflis valley with 'broken' curtains and heights complementary to the slope[4] (Ambrosi, 1979; Strappa, 2001).

An important turning point for the overall form of the ancient Bitonto, for centuries per-ched in a built-up area intra moenia, it took place in the nineteenth century, a century of deep changes that has gradually structured the territorial role of the city of today: it was decided to go beyond the city walls and establish a settlement extra moenia (Castella-no, 2008). If the fortified wall once constituted the impenetrable perimeter of the urban nucleus, following the 19th and 20th century transformations it became a segmental fra-me that aligned the building on board and motivated its structure. Unlike other cases, Bi-tonto chose the path of critical continuity with the ancient city, not denying the direct re-lationship with it but establishing a dialogue through the perimeter spaces, changing the relationship point by point according to the topographical and building characteristics on board. The plans to enlarge the old core, which followed one another during the 19th century due to the strong demographic impulse, established the direction of expansion of the town according to a radiocentric and convergent design towards the ancient nucleus which confirmed those centripetal signs consolidated for centuries (Parisi, 2018).

Restoration and enhancement of memory. A design for urban walls

When the architectural design involves a complex and stratified monument such as the urban walls, it is impossible to disregard the evaluation of the current state of consistency/survival, towards which to direct strictly conservative actions, and the formal control of the heritage of physical and environmental relations, to which their survival/revealing is entrusted. To the extraordinary document of military architecture must also be added, in the case of the Bitontine urban walls, the landscape plus-value that the position and morphology give to the emerging features.

In the specific case of Bitonto, the project is primarily subordinate to the degree of usabili-ty of the fortified structure, which can be traced back to three different levels of reading:
1. Sections belonging to the archaeological heritage, which include the foundation or basement segments, the moats, the curtains on the NW and NE slopes, the specialized bulwarks such as the polygonal tower in Piazza Castello or the Torrione di Sant'Agostino in Piazza XX Settembre: all components completely disused and subjected to the current road level;
2. Sections transformed by remelting or leaning on successive building units that have almost completely obliterated the curtains along the extramural Castelfidardo, Solferino, Magenta, De Ilderis;
3. Sections in a condition of substantial integrity, as shown by the curtains along via Volta and via Galilei.
This trisection accompanies and also defines three project matrices (Figure 1), which, due to the close link with the boundary conditions, determine a broader design from whi-ch the macro-architectural and urbanistic dimension of conservation clearly emerges:
1. Strategic redesign of the routes close to the walls for the government of perimeter mo-bility, both intramural and extramural, ensuring a unified connection between structural (vehicular, pedestrian) and integrative (cycle path, patrol walkways, etc..) to qualify a continuous path linked to the fortifications by physical and cultural relations that are thus enhanced and integrated into a circuit of use with high ecological and landscape value;
2. Unitary redesign of the on-board spaces, both intramural and extramural, connected to the walls by historical-physical relations that become the dignity of a square and privi-leged points of observation and understanding;
3. Restoration and recovery with cultural connotation of the elements of the urban fortifi-cations with the enhancement of the emergencies at urban level and the memory of the features subjected to the archaeological level through an urban design as a tool for rea-ding the past. In particular, rigorously conservative work must be carried out on the emer-

ging curtain walls, to ensure continuity of interpretation along the south-eastern side. This may be associated with the recovery as tourist-cultural poles of historical buildings that insist on the on-board spaces, accompanied by controlled removal of de-qualifying artifacts. A more articulated and complex dimension is that linked to the private ownership of the stretches transformed by operations carried out over time of overlapping, flanking or incorporation. Specific regulations of conservation and restoration must be addressed for these in order to facilitate the legibility of what in the built complex constitutes an episode of military architecture.

Interactive information totems are additional tools to support this project for the Bitontine walls, in order to understand the path and its nodal points. Next to this another one is the lighting specifically designed for the qualification of the three design constants:

1. Grazing illumination of the emerging curtains, with asymmetrical optic luminaires for the continuous and uniform illumination of the wall strip with differentiated colour temperatures to enhance the wall texture and the Habsburg stringcourse bull as a linear element of continuity;

2. Accent lighting and enhancement of emergencies (towers and city gates), with luminaires with asymmetric cut-off optics to prevent light pollution, aimed at enhancing volumetry, plastic relief and decorative details;

3. Lighting of the extramural road network, intramural routes and urban spaces with a differentiation of the chromatic values and technologies of lighting fixtures, with the aim of orienting and at the same time qualifying the urban spaces destined to the road system and collective activities (Fiorio, 2019).

The square on the walls: the design for Piazza XX Settembre

The methodological and operative approach to the conservation of the urban walls, just illustrated at an overall level, can find effective application in the concrete case of Piazza XX Settembre. This is an urban parenthesis that preserves precious pieces of Bitontine fortification and at the same time an area historically suited to the market function. The foundations of the Torrione di Sant'Agostino[5], a circular bulwark similar to the Torrione Angioino in Piazza Cavour and to which it was originally connected by a fortified line with an antemural moat, are subject to the archaeological level of this large public space located at the northern end of the ancient centre (Milillo, 1988). Today only the memory of this complex and multiform trait remains, through toponymy or documentary sources[6], while promoting its rediscovery and legibility becomes one of the most important bets. The reinterpretation of the sediment and its location in a space, be it a square, garden or street, is a problem of quality of architectural design that makes archaeological episodes as components of urban design. The survival/revealing of the submerged part ties its importance to the need to increase the heritage of knowledge, but inevitably brings with it the problem of the excavation and its consequent archaeological arrangement, incompatible with an urban space like this one, developed up to the contemporary phase.

The project, therefore, proposes targeted and detailed excavations to reveal the most significant sediments, adopting an urban dimension of archaeological musealization. The design of the square intersects paved and green areas versatile and functional to the logic of progressive excavation, so as to make accessible the remains that are gradually brought to light; the street furniture, however, as well as being functional to the performance of collective activities, is here thought as an important tool for reading the signs of the past. In this way we try to qualify the 'archaeological reservoirs' not as elements of subtraction of a usable space, but as components of a unitary urban design (Figures 2, 3, 4).

Another moment to understand the architectural and urban events is an artistic installation in strict continuity with the general regeneration design of the area. Always considered and lived as a place of rest and aggregation, Piazza XX Settembre has always followed, from a compositional and formal point of view, the destiny of the nineteenth and twentieth century planning, characterizing itself as an area located at the junction between the old town and the new districts that lead to the perspective towards the railway station of the new major axis of Via Matteotti (formerly Via Amedeo). Especially in the twenty years of Fascism, its role as a trading space specialized in the construction

of the Covered Market, the first building almost entirely made of reinforced concrete.
The new building was located in a strategic location for the city, moving from the concrete need to ensure order, hygiene and safety for the public market and ending up redefining functionally and aesthetically the entire area. The cycle of subsequent events gave the space back its initial vocation as a square with the definitive demolition of the Market in 1971.

This gave rise to the idea of flanking the new urban design of the square with an immersive labyrinth in which to live an evocative temporal parenthesis of memories and sensations linked to the memory of places. An open-air museum freely accessible to those who cross the square and in which to narrate, with the rediscovery of the past, those traces still strongly rooted in the contemporary world (Fasano, 2019).

Figure 1. Restoration and enhancement of the walls: Design concept.
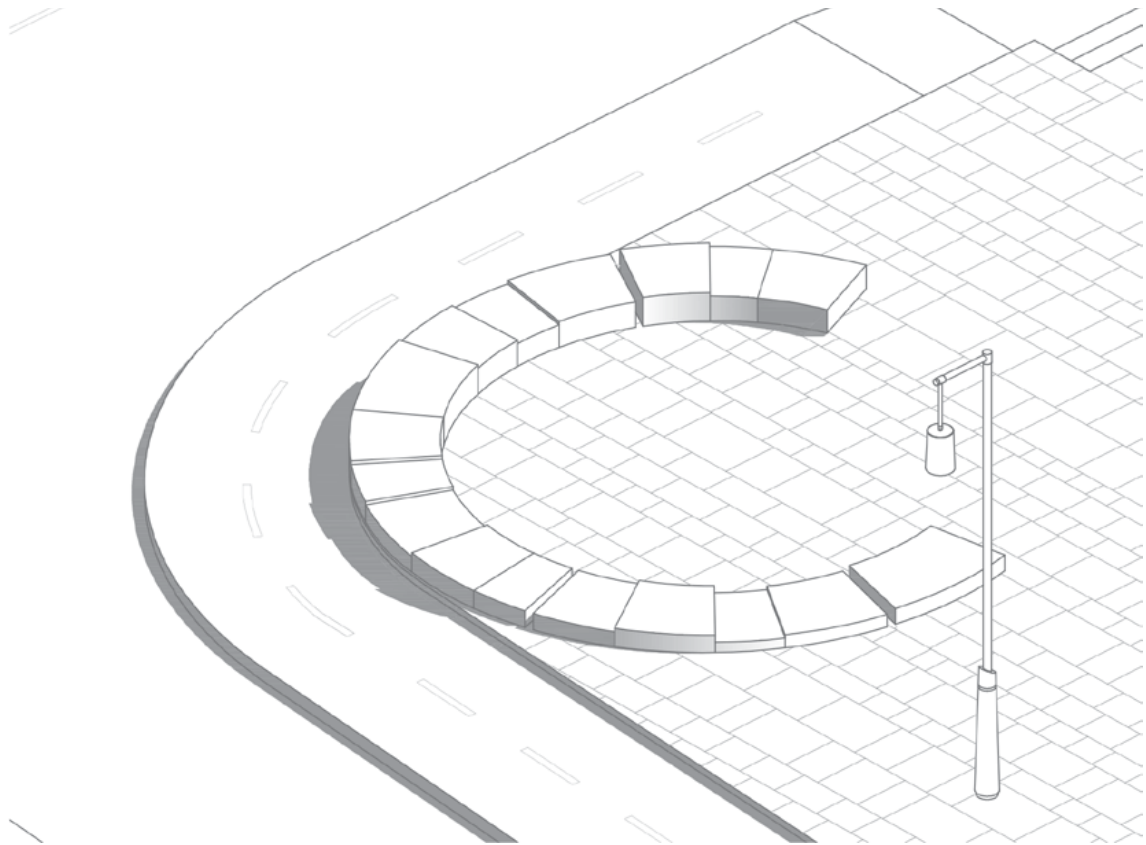
Figure 2. Piazza XX Settembre: Circular seat detail.
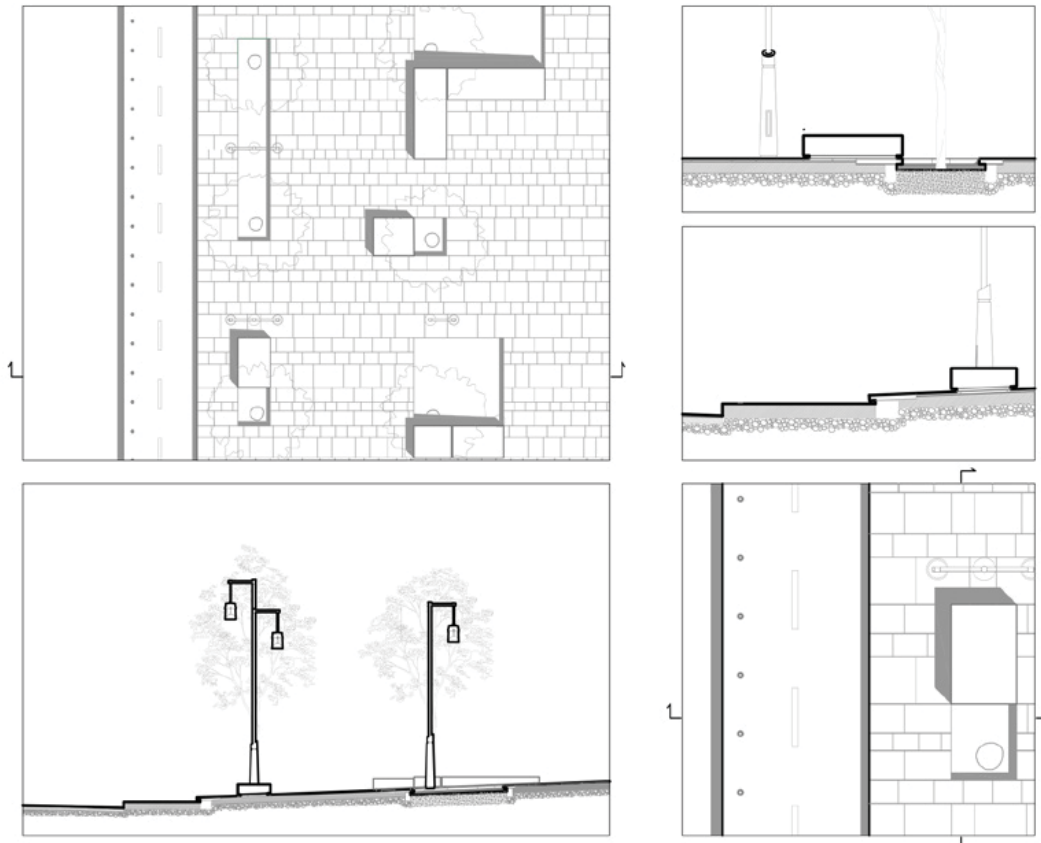
Figure 3. Piazza XX Settembre: Design details.
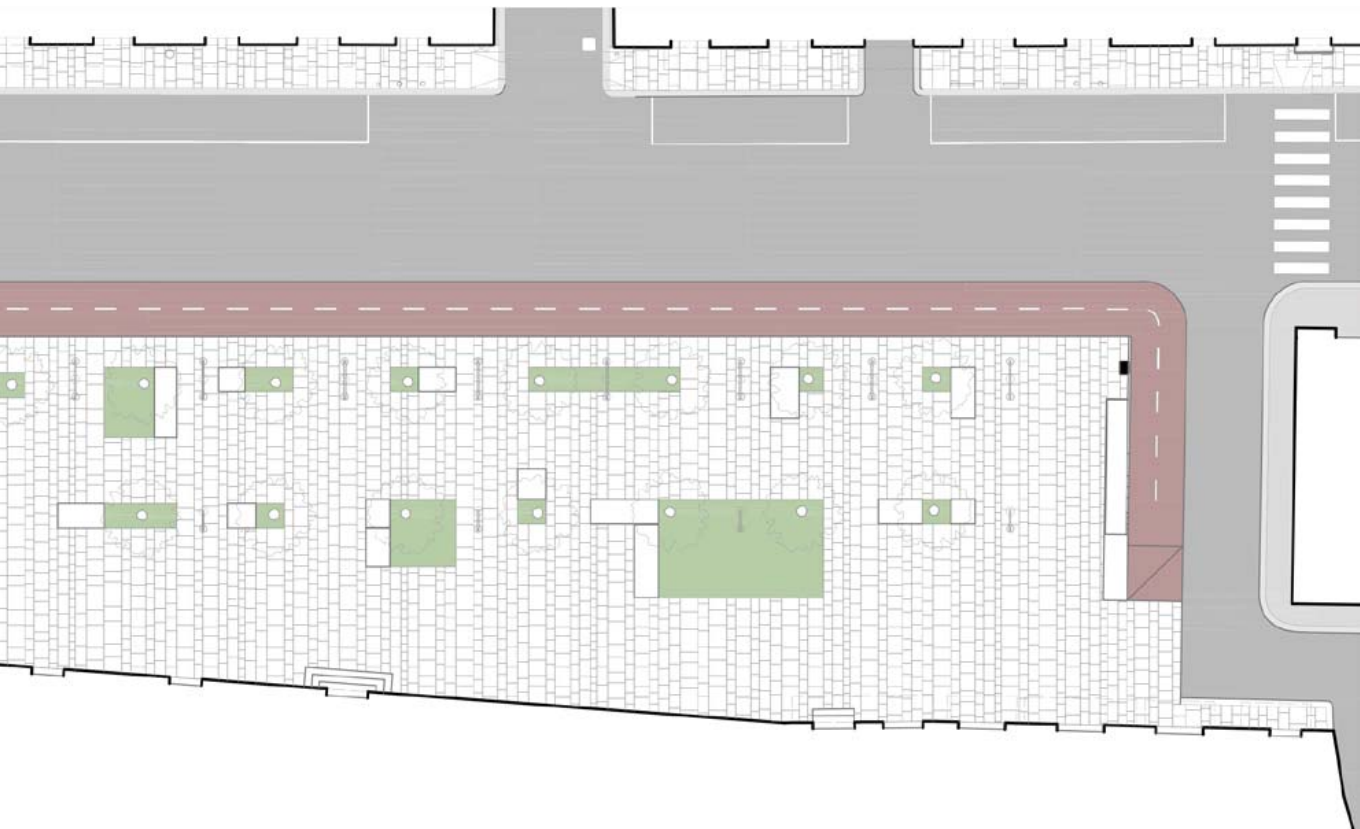
Figure 4. Piazza XX Settembre: General project plan.

Footnotes

[1] The most significant documentation in this regard is given by Michele Angelo Azzario, author of a late sixteenth-century drawing in which the Bitontino defensive system is represented together with other urban and suburban buildings. Drawing in pen with brown ink on white paper, MICHELE ANGELO AZZARIO. *Map of the city walls and elevation of the main buildings and some churches in the surrounding area* (1586 ca.) - Angelica Library, Rome BSNS 56/83.

[2] As evidenced by the dates engraved on the corner of Vico Goldoni and Porta Baresana.

[3] From Vico Goldoni, along via Volta, to the end of via Galilei.

[4] This special relationship with the natural element of the curtains on via Castelfidardo and via Solferino would be legible in the absence of the road filling that in the first half of the nineteenth century originated the level of the current extramural.

[5] Demolished in 1883, as remembered by an inscription inside the cloister of the former convent of San Domenico, on the time of the straightening of Via de Ilderis.

[6] In particular, a design by Michele Masotino for the connection between Vico III Amedeo and via Amedeo leading to the train station (1881, ASCB). In the relief are highlighted the demolished Tower of S. Agostino and the sections of Casa Sisto destined to be removed.

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