Abitare il FUTURO

Abitare il nuovo/abitare di nuovo ai tempi della crisi

Inhabiting the new/inhabiting again in times of crisis

Inhabiting the Future
Abitare il nuovo/abitare di nuovo
ai tempi della crisi

Inhabiting the new/inhabiting again in times of crisis
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University of Naples Federico II - Department of Urban Design and Planning

Tracce e sessioni / tracks and sessions
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    TOOLS AND STRATEGIES TO INHABIT THE CRISIS
T2. ABITARE: IL PROGETTO DELLA RESIDENZA
    INHABITING: THE HOUSING DESIGN
T3. PROCESSI SOSTENIBILI PER LA QUALITÀ DELL’ABITARE
    SUSTAINABLE PROCESSES FOR THE QUALITY OF LIVING

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Per conto delle edizioni CLEAN
Nelle Officine Grafiche Francesco Giannini e figli s.p.a.
Redesigning suburban public spaces with the transect theory

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ABSTRACT - According to a parallel between urban morphology and biology, the transect theory has borrowed a sampling technique used by zoologists, the linear transect, a method used for the census of wildlife. An axis is traced across a given territory to sample the living species within a specific biotope. These can then be used for restocking, avoiding to introduce specimens that do not comply with the characters of each place. Applying this theory to the urban project, within the analogy between the biological world and the notion of individual building type, has been widely experimented by the New Urbanism school (Bohl, Plater-Zyberk, 2006). We have tested such a method within the city of Rome, next to the L. Quaroni Casilino 23, designing an axis between the main urban polarities, as part of the trident provided by the city plan of 1931 (Strappa ed. 2012). The iugeral grid was used to dimension the urban fabric, hence the prevalence of this measure in the surroundings. Along this axis, used as transect, building types were sampled. This experiment aims to build for each site the prevailing building type, as if it was an animal species. The axis provided a pedestrian path within the new ecomuseum “ad duas lauros” recently approved by the Sixth Municipality of Rome under the influence of local committees. Testing a method to read a suburban area of Rome, proposes a strategy to design contemporary suburbs, where the rules for their transformation are inferred from the morphological analysis. This method allows us to find within a given territory and it's inhabitants the basic information to be used for contemporary renewal. (Ippolito 2006.)
1. **Theoretical premise**

The transect theory was first developed as a geographical and botanical survey technique (Von Humboldt and Bonpland 1793) and subsequently developed within botanical and ecology studies (Buckland *et al.* 1993). It was conceived as a technique to describe the distribution of different species along a path in a specific territory and to measure the distance of each sampled specimen from a given point. The New Urbanism movement (Katz 1993), (Duany *et al.* 2002) starting from early 1980s has experimented with success the application of this technique to urban design, developing a theory based essentially on the parameters of population density and distance, representing also the need for a different quality of urban living expressed by pedestrian movements, until the foundation in 1993 of the Congress for the New Urbanism. Using the population density parameter and the distance from the city centre, the urban to rural transect (Bohl, Plater-Zyberk 2002) was developed to optimize the pedestrian and vehicular traffic in new settlements and as a device to oppose the urban sprawl, using different densities and building types along an axis to optimize paths in a different way than the traditional zoning technique. Several authors (Lejeune 2000), (Duany *et al.* 2010), (Correa 2009) implemented such a theory in urban and landscape design with great success, and the Conference for New urbanism has considered in the last decades this topic as central in the international urban design debate. Several local authorities in the US have adopted linear transect theory for urban planning as an alternative to traditional zoning. This paper considers the application of transect theory to experimental design of public spaces within different areas east of Rome: *i.e.* the proposal for an archaeological park in Castel Madama (Camiz 2009), a small hilltop town some 50 km from Rome, the redesign of the Casilino 23 (now Villa de Sanctis) a suburb in Rome by Ludovico Quaroni (Strappa *ed.* 2012), the project for a Horizontal energetically self sufficient residential unit at Casal Monastero, a suburb outside the GRA east of Rome and the implementation of a Teaching Garden inside the park of Casale Garibaldi, Rome. Each of these case studies, at a different scale, implements a new flavor of the transect theory, adding to the traditionally adopted parameters, density and distance, also building types, plot measurement, street grids and especially archaeological sites, considering the processual evolution of the land asset, so to complete the ongoing process of urban development in accordance with its history. The aim is to develop furthermore the achievements of the New Urbanism teachings, implementing the transect to adhere to the morphology and to the site’s history, for the contemporary design process, with particular attention to landscape design, inferring the evolution of building types, urban fabrics, rural lot measures and street grid from the site. Some of this achievements have been published (Camiz 2011), (Strappa *ed.* 2012) without focusing on the implications within the transect theory, and some have also been implemented as an action with local grassroots committees.

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3 Cfr. Lavangaquadra (nova Arcadia) http://www.lavangaquadra.com
2. Methodology: introducing the IVth dimension for a processual transect

The design of public spaces in Italian cities has ancient roots: even though with some reference to the Roman model (forum), the public spaces of Italian cities as we know them today have a different juridical nature: the Roman public space, originally open in Republican times, became fenced and equipped with doors for access control during the empire, was owned by the imperial family and expressly dedicated to the cult of its tutelary deities; it was therefore not public in the sense that we understand today. The Italian public space (squares) came into being during the Middle Ages hence the deliberate action of free communes who developed their vital space in a subtractive manner: e.g. Piazza della Signoria in Florence (Guidoni 2002) where the blocks owned by the Gibelline loosing faction were gradually demolished for a new civic aggregation, the public assembly for the election of the council. Although some squares dedicated to public assemblies for the election of the Bishop near the cathedrals are known in Ravenna in Xth cent. (Camiz 2006), it can be said that the "public" space develops its final form and civic role starting from the XIIIth century with the mature phase of the communal experience. These new public spaces derived from common land ownership and were usually linked to the presence of a market: the public space became thus a place for exchange and a place for civic meeting. This manner of designing public spaces was consolidated in the following centuries with many examples in modern times, where the birth of modern theater stood initially here through wooden stalls mounted temporarily, before the evolution in the form of a closed building (Strappa 1995). The design of public spaces therefore used specific design skills, shaping the urban space in a "theatrical" manner. With the rise of the bourgeois palazzo building, as the recast of an aggregation of former row houses, very often in the same building adjacency, an empty space was born with the character of an open public building without walls. Following this processual evolution and considering the scalar properties of the transect theory, we introduced the 4th dimension of time, finalized to a processual transect. In European contexts, both urban and rural, where what is considered as a natural environment in the American New Urbanism is, de facto, the strongly stratified palimpsest of subsequent anthropization phases, design should be founded on site’s history, understanding its processual evolution to infer the rules for contemporary transformation. In strongly layered contexts, typically in Italy, where the contemporary city is a continuous processual evolution of preexisting assets, the fourth dimension is useful to develop the transect theory.
4. Scalar properties of the *processual* transect: HUGE, LARGE, MEDIUM, TINY

4.1 Case study A: HUGE_Archaeological park at Castel Madama (RM)

The action "International Workshop of sustainable architecture in archaeological area" was proposed as part of the Local Agenda 21 of the province of Rome and was carried out in 2008 in collaboration between the University of Miami, School of architecture and the Faculty of Architecture of "La Sapienza" (Guerrero 2011). Thirty architecture students from the two faculties, worked on several assignments in Castel Madama and especially on the landscape design of four roman aqueducts (Anio Novus Anio Vetus, Aqua Marcia, Aqua Claudia). Among the achievements of the workshop particular evidence should be given to the archaeological constraint designed along the entire path of the four aqueducts in the municipal territory. The constraint strip was dimensioned 71 m. wide (pedes CCXL) according to the model of the ancient *iugeratio*. The proposed constraint has been inserted in the general variant of the local regulating plan and is a now the prerequisite for the construction of an archaeological park of the aqueducts connecting the high Aniene valley with Rome, with a size (70 km) comparable to that of the Great Chinese Wall. The path of the four aqueducts was inferred by the archaeological surveys (Giuliani 1966). This path, as we verified within the research, presents some uncertainties, especially along the underground parts. Pending specific studies and extensive surveys, we proposed a restraint based on the measure of the longer side of a *iugerum* (approx. 71 m), the mensural system used in roman times for the land partition around the aqueducts’ paths, so as to constitute a linear green corridor (Angrilli 2002) wide enough to contain any deviations of the real paths from the informations in the literature. The permanence of the iugeral system in current agricultural partitions was used for the construction of a band adjacent to the aqueducts as a semantic system to communicate their path at the landscape scale. The model was supplied by the aqueducts themselves and is essentially a regulator square grid of 240 feet, according to the Roman mensural system. All the workshop projects have inferred from the model indications on the position, orientation and form so to define the limit of an archaeological area. Furthermore, the same grid was used in the definition of measures of the architectural elements, of structural bays and axis of symmetry: each project thus resonates with the same frequency of the main subject of the composition, the aqueduct. This same grid was used in the landscape design allocating areas to specific agricultural productions as vineyards and olive trees (Deretta, Uras 2010). The plantings provide an indication at the landscape scale of the presence of the aqueducts, even when their path is located underground. The Roman mensural system was considered as an immaterial model inferred from history and used in design as transect. Any alteration of the relationship between the model and its territory was avoided, the design of an archaeological site, in this case, was therefore reduced to the continuation of a transformation process still underway, where the ruin is one of the phases of architecture.
4.2 Case study B: LARGE_Casilino 23 (Villa de Sanctis), Rome

This case study is part of a research of the Ateneo Federato dello Spazio e della Società, Sapienza Università di Roma, (Faculty of Architetture and Faculty of Sociology) directed by prof. G. Strappa on the formative processes of the urban fabric in the Roman area. The research (Strappa ed. 2012) investigated the formative processes of part of the eastern suburbs of Rome, the so called Casilino 23 area, considered as exemplary, demonstrating that the periphery can be read with the same care usually given to a city centre or to an archaeological site. The identification of the formative process of the urban fabric became crucial for the project, which proposes to continue this process, after having acknowledged the crisis of the contemporary city. The 1931 regulating plan of Rome provided the development of this part of the city through a street trident as a continuation of the urban axis of via Malatesta. This design was obliterated by the new regulating plan of 1962 and not completed with Ludovico Quaroni’s zone plan in 1964, but this trident is now still readable in the street network. The axis of via Malatesta connects the axis of Viale delle Gardenie at Centocelle, the southern branch of the trident reaches via Ceprano, and the northern Via Federico Delpino meets the axis of the Prenestino Fort. The southern branch coincides with one of the directions of the rays of the Quaroni settlement. The axis does not just match one of the different directions of the fan, but the most important, the one that determines the position of the main square where the church, the market and the school are. The comparative analysis of Roman Ludovico Quaroni projects, showed a great difference of this project from the series, revealing the hands of another collaborator Roberto Maestro. The relationship between building fabric and paths in this project is almost *impromptu*, the relationship between roads and building volumes is divided by the separation of pedestrian and vehicular traffic, only in one case, the road axis coincides with the urban void. The result is a perceptual complexity, almost an urban disorder, which makes the
neighborhood visually isolated from the context and of difficult orientation. The Quaroni intervention, perhaps randomly, has collected one of the axes of the trident foreseen by the 1931 plan. The piazza Gerardo Maiella is at the end of this axis. The axis determines thus the position of the central square, aligning the bell tower of the church of S. G. Maiella, and identifying the location of the center of the settlement. The axis south of the trident of ’31 was proposed as a master plan within an urban design workshop. Along this axis - used as a transect - building types were sampled. In this project we wanted to use for each area the prevailing building type, as if it was an animal species. The main road was not projected in the neighborhood but connected to the existing streets, providing a pedestrian path within the new park “ad duas lauros”. This park will be part of the future ecomuseum “Ad duas Lauros”, which under the influence of neighborhood committees the Council of the Sixth Municipality of Rome has recently approved (Santilli 2011). Within this model several examples of urban design experiments done in the workshop accomplished the grid size inferred by the reading of processual evolution of land ownership patterns along the axis. Along this transect the reading across time, given by archaeology and archival research, spotted the ancient orti holeari of roman times and their persistence in medieval times.

“accipimus a vobis quinque ortos holearios, quos positos foris portam Maiorem ad Aquam Vullicantem cum pertinentis heorum per chartula commuta”4

Their modular size was used as a model for the workshop design, for an architecture rooted in history, experimenting furthermore a four dimension transect, and for the last case study (TINY) that reproduced through local committees, in an experimental community design, the same pattern. This area has been considered before in another experimental design based on models that should be mentioned here (Aymonino, Dardi, Panella 1973).

“Sapienza” University of Rome, Faculty of architecture, graduation thesis of Alessia D’Angelo, “Urban renovation of the area between Via Labico, Via Cori and Via dei Gordiani, Rome”, rapporteur G. Strappa, correlator G. Caruso, tutor A. Camiz, 2011.

4.3 Case study C: MEDIUM_Horizontal energetically self sufficient residential unit, at Casal Monastero, Rome

The same horticultural grid inferred by recent archaeological excavations in the Casilino area was adopted, coupled with the model of the ancient urban fabric constituted by roman domus, i.e. 35,50 x 17,70 m. ca. (Caniggia, Maffei 1979) as a regulating grid for another experimental design, the graduation thesis of Marta Zappalà, Energy self-sufficient horizontal dwelling unit at Casal Monastero, Rome (Zappalà 2012). This projects shows as the ancient roman urban grid and the rural grid, based on the same mensural system (iugerum), can be combined in landscape and architectural design. The processual transect was useful in this case for the contemporary design of a residential dwelling unit. This composition evolved through the application of processual specific urban design techniques (Caniggia, Maffei 1984). Based on multistory court houses and duplex row houses, the project included private and community allotments, roof gardens, wet composting areas, rainwater harvesting for irrigation and residential use, photovoltaic panels, solar thermic water heating, and it proposed a completely self sufficient dwelling conceived with a deep rooting in ancient history. The design, in no way at all, accomplished the imitation of inherited historical forms, and was not revivalist or postmodernist, but is the continuation of an ongoing process with very deep roots in ancient history, so to give contemporary life to the architectural organism, with a precise reference to one of the most radically modern italian architects such as Adalbero Libera and his Horizontal dwelling unit at Tuscolano, Rome 1950-1954.

4.4 Case study C: TINY_Teaching Garden, Casale Garibaldi, Rome

A medieval community-based practice, the use of allotments for periurban agriculture, suggested to a newly constituted local grassroots committee a proactive social policy called “urban gardens for the safety of the metropolitan territories” to give a broad spectrum of responses to the various problems that people recognized as priorities through a questionnaire; i.e. security, waste, lack of public facilities, lack of public spaces, urban decor, economic crisis, pollution. The design of a public area for the practice of an allotment garden, as provided by the code of the current regulating plan of Rome can, if properly managed, give an answer to each of these questions in a transparent and shared manner. We need to find ways to experimentally decline in Roman lands a practice widespread in northern Italy and in Europe, through public tenders for the allocation of plots to gardeners, according to a grid of scores able to respond to different user groups. We proposed a pilot project in an area of approximately one hectare in the sixth municipality of Rome, about three hundred plots. An articulated regulation should decide how to assign the plots and other service activities. The protection of the territory supplied by local gardeners becomes a form of control and influences the perceived safety of the inhabitants. To develop these landscape design strategies for community gardening and horticulture an association was founded. The activities carried out so far by the civic group are aimed at building a community of people and organizations strong enough to adopt an allotment garden in the territory of the sixth Municipality of Rome. Through Facebook, with the group “no more discussions: social allotments now” a number of citizens started working: a website was created with five open source discussion lists. Using digital tools and social networks this community met: through the website questionnaires was collected, in order to represent in aggregated form, the request for allotments in the sixth municipality of Rome, so far 98 detailed requests of citizens for a small garden. These citizens were involved in the project through assemblies, social dinners, meetings, and especially actions on the territory, such as cleaning of green areas, making small flower beds and the distribution of plants. Soil samples were taken in three different locations to verify the presence of pollution by heavy metals, in all the three sites the presence of lead and zinc was relevant and in two cases above allowed limits for public green areas.

<table>
<thead>
<tr>
<th>Site</th>
<th>Lead (Pb) mg/kg s.s.</th>
<th>Zinc (Zn) mg/kg s.s.</th>
<th>Mercurium (Hg) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parco Sangalli, Rome</td>
<td>96</td>
<td>92</td>
<td>&lt; 0,32</td>
</tr>
<tr>
<td>Via Pisoniano, Rome</td>
<td>138</td>
<td>89</td>
<td>&lt; 0,32</td>
</tr>
<tr>
<td>Casale Garibaldi, Rome</td>
<td>223</td>
<td>249</td>
<td>0,62</td>
</tr>
<tr>
<td>Quantity Allowed</td>
<td>100</td>
<td>150</td>
<td>0,32</td>
</tr>
</tbody>
</table>

Soil pollution by heavy metals, three sites in the sixth municipality of Rome, soil analysis by Centro ricerche chimiche Montichiari, Brescia, 2012.

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5 Lavangaquadra (nova Arcadia), founded in Rome on April 21st (dies natalis urbis Romae) 2012.
6 http://www.lavangaquadra.com
7 Decreto legislativo 3 aprile 2006, n. 152, Norme in materia ambientale, allegato 5, tab. 1, Concentrazioni soglia nel suolo e nel sottosuolo per siti ad uso Verde pubblico, privato e residenziale.
Within the most polluted site, in the park of Casal Garibaldi, the group is currently experimenting a technology for the fitoextraction of lead from the soil using a Brassica Hirta plantation. The Brassica Hirta (Sinapis alba L.) absorbs a percentage of lead in the soil after two years. At the Casale Garibaldi, a public garden of the City of Rome entrusted to the Association "Casale Garibaldi", as envisaged in the project, the group started a small teaching garden, where experiments are being implemented in the form of a municipal laboratory, for the purpose to cultivate edible vegetable in the metropolitan area. Aggregating other citizens through the schools of the district three small areas of cultivation in lead contaminated soil were started with the aim to analyze the vegetables for the presence of lead, and a composting station was placed in the area for humid waste disposal of the comprensory. Last experiment underway is the construction of raised beds allotments built recycling wooden europallets, filled with guaranteed soil to grow edible vegetables. All these elements were designed according to the iugeral net and using the roman allotments found nearby as a model. This case shows thus the developing of a very small teaching garden in the neighborhood as a result of the application of archaeological evidence of roman horticultural techniques, along the transect, with an inversion due to urban new polarities and with design of allotments within the same grid and mensural system. The urban park, a collective place where nature is protected by the industrial development, holds in today's society a noteworthy symbolical and material value (Ippolito 2006). The planet's resources are limited, and day after day entire ecosystems are slowly disappearing. The realization of a network of urban allotment gardens, one of the most interesting experiences of socialization of the land, which consist of the assignment by a local authority, is useful fight against global warming increasing of biomass in metropolitan areas.
5. Comparative analysis: common characters, inheritance and displacement

All the case studies, at very different scales, implement an experimental version of the transect theory based on the assumption that to design what will be, we need to know well what is there and also what was there before: introducing the fourth temporal dimension in transect theory takes us to acknowledge the processual evolution of types and fabrics in urban, metropolitan and rural areas finding what elsewhere - in the same sense finalized to design - was called diachronical variant of types (Caniggia Maffei 1979). So the processual transect enables the study of a given territory with attention to its past history but finalized to its future transformation: only if the transformation is compatible with the ongoing process the project can accomplish it with success without altering the equilibrium of the site.

Two recycled euro-pallets used to build a “raised bed” with biological soil and grow vegetables in metropolitan areas where contamination by heavy metals makes agriculture inadvisable.

6. References


