Utility of urban morphology studies for the design process: some educational experiences

Alessandro Camiz
Faculty of Architecture, Design & Fine Arts, Girne American University, TRNC
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Abstract

Enhancing, within the educational teaching of architectural design, the strong continuity between the typological evolution of the built organism and the building to be designed (Petruccioli, 1998) can greatly improve the architectural design process. From the territorial scale, to the scale of the urban tissues, the understanding of the coherence of paths and settlement patterns within a given site morphology, is the prerequisite for the proper design of the built organism. The paper will illustrate some case studies, in Latium, Rome and Cyprus, focused on the knotting process (Strappa, 2013) and the Muratorian design method (Maretto, 2013), underlining the strong continuity (Whitehand, 2012) between the Conzenian approach and the Italian School of Urban Morphology (Marzot, 2002). From the form of the site and the diachronic evolution of settlement patterns, it is possible to infer the transformation to propose with the contemporary design. The territorial scale is therefore the specific methodological base for the full understanding of the scalar properties, verifiable within other scales, such as the urban organism scale, the urban tissue scale, and the built organism scale. (Cataldi, Maffei, Vaccaro, 2002).
Introduction

Greek mythology (Esiod, Theogony, 52) represented Mnemosyne, the goddess of memory, as mother of the nine muses; the archaic myth reorganized the genealogy between the arts (muses) and history (memory), showing history as the mother of the arts. It is not until the XX century that science could define scientifically the memory, at least the digital memory, with the introduction of the binary bit as a measuring unit. After the invention of informatics though, memory has gradually lost its role in society, following its substitution with digital memory. This process is following the reification of human memory, the translation of the German word Verdinglichung (Marx, 1894, p. 48). A famous historian, (Le Goff, 1988) outlined the history of memory through different societies, showing its role in the construction of political power. The memory does not survive orally, unless someone ritualises it through some form of art, such as music, dance, and we should say here also architecture. Therefore, only the organization of a society that transcends the familiar genealogy can keep the memories of the past and transmit them to the future generations. This operation is the base of the construction of the social aggregation of human beings and of political power. Giordano Bruno wrote an entire treatise on memory (Bruno, 1582) based essentially on the analogy of architectural spaces and information to be remembered, so we should recall today how important memory is within architectural education.

Enhancing, within the educational teaching of architectural design, the strong continuity between the typological evolution of the built organism (the memory), and the building to be designed (Petruccioli, 1998) can greatly improve the architectural design process. From the territorial scale, to the scale of the urban tissues, the understanding of the coherence of paths and settlement patterns within a given site morphology, is the prerequisite for the proper design of the built organism. The paper will illustrate some case studies, in Latium, Rome and Cyprus, focused on the knotting process (Strappa, 2013) and the Muratorian design method (Maretto, 2013), underlining the strong continuity (Whitehand, 2012) between the Conzenian approach and the Italian School of Urban Morphology (Marzot, 2002). From the form of the site and the diachronic evolution of settlement patterns, it is possible to infer the transformation to propose for the contemporary design. The territorial scale is therefore the specific methodological base for the full understanding of the scalar properties, verifiable within other scales, such as the urban organism scale, the urban tissue scale, and the built organism scale. (Cataldi, Maffei, Vaccaro, 2002).

Some of the graduating thesis developed within the PRIN 2009 illustrate herein the application of the above premises. The National Research (PRIN) was named “From urbanized countryside to “expanding city”: the norms of composition for the architecture of the territory of minor centres”, and directed by L. Ramazzotti, Università degli Studi di Roma “Tor Vergata”, Facoltà di Ingegneria, Dipartimento di Ingegneria. The research Unit B, under the file of “Intervention methods for development and design in urban tissues of small towns of Lazio”, operated under the direction of G. Strappa, “Sapienza” Università di Roma, Laboratorio lettura e progetto dell’architettura (LPA-DIAP). All the projects follow the assumption that the city is a living organism belonging to a larger scale territorial organism, the historical documentation and the safeguard are necessary for the correct future development, it is necessary to understand the origins for the contemporary design. All the cases shown belong to the category of small towns, considered as the nodal development of the intersection of a ridge and a cross ridge route, polarized by a market. These settlements developed through time in a hill top position to defend themselves from enemies, and to connect with allies. We considered the foundation
characters of defence and connection as the guidelines for the contemporary design. The defence from urban sprawl, and the connection with infrastructures.

Methodology

In accordance with a consolidated methodology (Caniggia, Maffei, 1979), (Strappa, Ieva, Dimatteo, 2003), by analysing small historical towns and their landscape it is possible to acknowledge the urban fabric’s formation phases before considering their transformation project. The province of Rome’s so-called “small” historical towns are an important cultural resource and, together with their tangible and intangible cultural heritage, form a unique social capital. We should optimise, protect, and above all documented these settlement, before an uncontrolled urban development will erase their historical memory forever. The case of San Vito Romano, analysed in accordance with the “close correlation between ancient documents and the settlements’ physical conformation” (Guidoni, 2006), is characterised by separate phases that can be interpreted with a certain clarity. The case studies presented herein focuses on the area between Tivoli, Subiaco and Palestrina: an area characterised by various ethnic ridges, the Aequan, the Hernic and the Latio ridges. We selected two small towns San Vito Romano and San Polo dei Cavallieri, considered as belonging to the two different sides of the same orographic ridge, the watershed between the hydrographic basins of the Rivers Aniene and Sacco, which marked the boundary between various cultural areas as from ancient times. The geological area is extremely fragile, set between the Apennine and the Prenestine mountains, two calcareous ranges that push on each other, compressing the interlying layers of sandstone, distorting them into waves. Therefore, the alternating grey and yellow layers of sandstone are extremely crumbly and subject to landslides along the frequent slippery slopes, which can easily fall one onto the other during heavy rainfall.

Formation process

The third case study, the Αχειροποίητος monastery in Cyprus, shows the superimposition of different constructions. The existing domed church, built with a central plan in late Byzantine times over the ruins of an early Christian basilica with three naves, and subsequently was enlarged by the addition of three successive narthexes, and therefore transformed into a Latin longitudinal basilica. The name Αχειροποίητος, literally made without hands, was referred most probably in the origins of this church to an icon “made without hands”, so probably one of the numerous images of Christ or of the Virgin that are referred in history. The name, through several wrong writings and therefore misunderstandings survives to this day, telling us in an immaterial way a part of the history of a building conceived, and therefore named, to host this sacred image. The monastery surrounds the church, with different phases and different additions, bearing a long and very complex ownership history. The formation process can be traced as beginning with the late antique basilica built in the V century in the suburbs of the ancient city of Lapithos, all the way down to the transformation of the site into military barracks in the 1970’. Recently the Department of Antiquities assigned the complex to the Girne American University, for urgent preservation interventions. Therefore the management of this site, hence the political situation of northern Cyprus, represents an interesting case study on the ownership issue. The reconstruction of the diachronic sequence of ownerships is therefore a prerequisite for the full understanding of the different past phases of the building and hence essential for its preservation and continuation into the future. The history of ownership follows very slow changes, and in some cases, can give us some information about the formation process of the architecture. The heritage management in Cyprus, for the complex political situation of the island, bears more difficulties than in other UE countries, but we should consider that every heritage site has someway a contested character.

The International Centre for Heritage Studies was been established at Girne American University in August 2012 to bring together scholars and practitioners, and support a comprehensive approach to the study of heritage. The affiliates are academics in the fields
related to heritage studies (such as architecture, restoration, history, and archaeology) working at local, national, and international levels. The research centre’s mission is to host researches and studies on heritage, in Cyprus and abroad, with particular focus on Architectural Heritage, including history, survey, documentation, restoration and design. During the international workshop “Reading and designing the area of Lambousa, Karavas”, held in Girne in 2014, we started different researches on the monastery. Specifically the activities accomplished include the laser scanner survey of the whole complex, the documentation of mosaics, spolia and wooden artefacts, the study of the different historical phases of the monastery, the design of a museum to host the Lambousa treasure, the design of a garden, and the design of an addition to the building. The international workshop was essential for the wider international cooperation framework and an essential prerequisite for the preservation and continuation into the future of the monument together with the UNDP and the Technical Committee for Cultural Heritage in Cyprus.

The reconstruction of the formation process of routes and settlements in the area of the monastery is one of the premises, following the Italian school of urban morphology, for the design of an addition to the monastery. On the northern coast of Cyprus, a main mountain ridge goes all the way from the East to the West; from this main ridge, secondary ridges descend towards the sea organizing the slope in a readable territorial organism. Only with the full multi-scalar understanding of the urban, territorial and built organism, it is possible to design an architecture conceived as the continuation of the ongoing process. We conceived the contemporary design not as opposed to history, but rather as a continuation of the past into the future.

Teaching architectural design focused on archaeology is essential in Cyprus where ruins bear a relevant symbolic value: for the students the ruins become the living testimonies of a forgotten past. Several educational experiences have shown that architecture students, in the face of a ruin, assume a reflective attitude that forces them to consider
the context, in this case the archaeologica l context, as an integral part of the architectural design process. Often architecture students cannot understand ancient architectures, and therefore they are pushed to question their real subject expertise. They are indeed concerned about the ruins, since they belong to architecture, although old and abandoned, but cannot really deal with them. In other words, the relationship with the archaeological context triggers students’ particular attention and leads them to consider the place and the artefacts that were there in the past as a single organism. The mental process of understanding the relationships between different parts of an ancient building facilitates the transposition of these relationships to the contemporary design of a living organism. Most difficult for an educational project within an archaeological area, is to transmit the choice of a quiet poetic: a compositional process based on the dialectics between foreground and background. If the main subject of the composition are the ruins, the proposed new architecture should assume a background role, cautiously avoiding any desire to emerge as an independent form. This composition exercise becomes crucial in contemporary architecture, where the research seems dominated by striking figures rather than by the silent construction of architectures in continuity with a still ongoing process (Strappa 2014). Designing within an archaeological area, we should also consider also the absence of a given frame or limit. In the ordinary design process, the frame is determined by the property limits, and inside this frame, the architect usually displays his compositional figures. An archaeological project instead overlaps different frames, one given by the excavation perimeter, the other by the limits of existing public and private properties, another one comes from the limit of urban areas, the perimeter of archaeological restraints is very important, and finally the perimeter of the ancient architecture and its pertinence. In these cases, architects should design their composition within a complex framework, and not as a single meaningful subject. If the project normally consists in the elaboration of an architectural figure within a given frame, in this case the design exercise consists rather in the development of a complex system of frames inside an existing framework, the archaeological site. Usually ruins look like an incomplete figure, a partially obliterated picture, and herein the project should develop an independent relationship with the past avoiding any historicist mimicry.

The correct way for an architect to walk on a classical soil is to design the limit of the ancient site as a contemporary place. In addition, the design of an architecture within the ruins highlights the sustainability of pre-capitalist architecture, which can be opposed to most contemporary architecture. From Vitruvius to Alberti, from Michelangelo to Bernini, the envous of the Prix de Rome, Schinkel, Louis Kahn, Le Corbusier, Libera and Quaroni, most important architects have dealt with archaeology within their work: archaeology offers a catharsis for contemporary architecture; it is not a place where to bury ancient or modern repeatable styles. Designing the space between the city and an archaeological site therefore provides some educational tools to guide future designers even in small historical centres (Strappa, Carlotti, and Camiz 2016). Herein the same silent poetic and balanced relationship between foreground (historical context) and background (contemporary project), can reasonably be replicated and experienced with the specific purpose of reconstituting a formal relationship between the context and the contemporary design process.

Different design groups, coordinated by the writer, have adopted a general strategy specification to design some small projects; all the proposed interventions follow the sustainability, and the design principles defined by Cesare Brandi, i.e. reversibility, recognizability, compatibility, minimal intervention and the partial image reintegration. (Brandi 1963). The project completes the formation process of the anti-nodal Eastern special building as the monastery complex is. We considered the ancient monastery as a living organism to be continued by a new addition, the project therefore, using contemporary materials such as steel, stone and wood, replicates the same measure of the bays of the monastery so to develop the addition. We designed the elevation of the new composition to extend the fundamental lines of the ancient monastery: ground line, base, elevation, connection and conclusion lines were continued in the new composition, strictly avoiding any mimesis of the ancient buildings, and continuing the same
organism started with the construction of the ancient church. The nodes where the new architecture encounters the old buildings are the crucial part of the design operation. The addition completes the living organism of the monastery, avoiding strictly any kind of aesthetical contraposition. Neither touching the old building, or bearing loads on the old walls. The new building is thus recognizable as another part and a different piece of a composition that shows even today and unique character. The distributive system of the complex, expresses the continuity with the past by granting full accessibility to all the parts, even for people with disabilities.

**Conclusion**

Within the workshop, we compared different definitions of landscape: the one given by the European Convention of Landscape, “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors” (EU, 2000), and that provided by Emilio Sereni, “the form that man, in the course and for the purpose of its agricultural production, consciously and systematically gives to the natural landscape” (Sereni, 1961). (Camiz, 2011). The discussion questioned if the landscape design should be a conscious material transformation of a living organism, or an aesthetically oriented manipulation of an in-animate object, and then proposed strategies for the education of conscious communities that can guide the transformations so not to follow only speculative interests. Following these premises, we conceived a garden within the monastery of Acheiropoietos, inspired to Walafrid Strabo’s poem. The *Hartulus* was composed in Latin in the IX century using hexameters to describe the monastic garden...
of Reichenau. In the poem, 23 different plants are described. These same plants were chosen as a living model for the project. The project uses wooden floor and flowers beds with a self-sufficient irrigation system and green hedges, demonstrating how it is possible to design a contemporary garden, following a medieval model, in an archaeological site, according to the analysis of Urban Morphology, and the principles of restoration described by Cesare Brandi: i.e. recognisability, compatibility, reversibility, minimum intervention. (Brandi 1963). This enclosed medieval garden was designed to host, in one part the twenty-three plants described in Walther Strabo’s Hortulus, and in the other part, a garden dedicated to mint plants. Both of the two parts of the garden were designed, using sustainable materials and very simple technologies, so to propose a possible solution for a compatible, reversible and recognizable design within the site of the ancient Monastery. The continuation of the existing path of the portico was outlined as a system of matrix, implantation and connection routes, so to dispose the flowerbeds containing the plants in a way that simulates the formation process of an urban tissue within the monastery. The result is a continuation of the formation process of the monastery that enhances the site and its history, without imitating the past.

None of the proposed projects will be built in reality, but they conceived as the experimental application of a theoretical method. The proposed method, based on the careful examination of each context and its history, recovers the rules of the transformation from the analytical reading of the formation process of the artefact. Through a project, not intended as an impromptu academic exercise, but rather as a design experiment, we intend to suggest to the local authorities some possible interventions in the area of the Monastery. The projects represent diverse topics, such as the reintegration of the image,
or that of the construction of the margin, but they are all, in different ways, set on the transposition of the Brandi’s principles of restoration to the architectural composition. All proposed projects are reversible, recognizable, consistent, and based on the minimum intervention, but finally the resulting picture certainly does not belong to the domain of the restoration itself, but rather to that of architectural composition in archaeological area. In the analysis of the formation process of the monastery, the contribution of urban morphology and architectural typology was essential, so to develop analytically the proposal of an addition to the monastery as the continuation of an ongoing process.

In TRNC the faculties of Architecture offer undergraduate curricula in architecture which usually include only two exams in history of architecture, one theoretical exam in restoration and no elective courses in history, archaeology, restoration and survey. In addition, the different curricula available in the bachelor, master and PhD, do not include any specific option regarding heritage, so no curriculum is available for the future architects, in restoration, history or heritage management. By comparison in Italy most of the faculties of architecture include three exams in history, two studio exams in restoration, one exam in survey and one in heritage in their curriculum, in addition to this there are specific master curricula dedicated to heritage (such as the master in Architecture (restoration) at “Sapienza” University of Rome). Also in Italy, there are a specialization course (post master courses) in restoration, and several PhD programs in restoration, history and survey within the faculties of architecture. Many Faculties of architecture do have a Department of History and Restoration: and before the last university reform, which forced all Universities to aggregate their departments (so to have over 50 members) every faculty had one Department dedicated to history and restoration. In addition to this, following the compulsory professional continuing education that every practicing architect have

**Figure 4.** The formation process of the project, D. Michele Daniele, F. Lotiego, V.D. Matteis, Architectural reading and design of the continuation of the Acheiropoietos Monastery, tutors: A. Camiz, L. Ferroglio, International design workshop/Graduation laboratory (Architecture and Restoration) Reading and designing the area of Lambousa-Karavas, Cyprus, 2014, Girne American University, “Sapienza” University of Rome, 2014
to follow, 20 credits per year, some Chapters of Architects (such as the Rome Chapter of Architects) developed specific professional training programs dedicated to heritage. There is a Department of Heritage in the Roman Chapter of Architects, founded in 2008 and directed by Virginia Rossini. In these last seven years the policy that the largest chapter of architects in Europe has adopted (Rome has 18224 registered members. Source: Chapter of Architects President, September 2015) for professional training includes heritage as an important topic.

In the last years seminars, conferences, and workshops contributed in increasing the level of understanding of heritage within registered professionals. In countries with a history of several millenniums of civilization such as Italy and Cyprus, adopting a specific teaching policy dedicated to heritage can increase the jobs available for the new generations, and help the registered professionals to catch up with the many activities the often are offered through tender calls by UNPD and EU.

Today with this situation in education in TRNC there is no option for architects trained in this country to work in the Heritage sector. The professional activities that architects can follow in Heritage, include the survey of monuments, archaeological sites and urban tissues, the documentation of heritage, the restoration, the management of Museums, archaeological sites and archaeological parks, the design of all the above, and also the design of new architectures in historical and archaeological contexts and finally, of course, the historical research. We are proposing here a new direction in architectural education in Cyprus which would affect seriously the job offer in the future, but also help Cypriot architects to participate to heritage design and management outside the island, and with a serious outcome in the perception of heritage in the people, and therefore in the inherited collective memory of the Country.

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