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se i "vuoti" non si riempiono /if "voids" do not fill

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Mario COLETTA

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Filling infrastructures and urban voids with nature: green areas typology

Paolo Camilletti

Abstract

The present paper aims to highlight the variety and the functions of green areas in urban contexts, focusing on those which are related to the infrastructures, as components of the environmental heritage.

The typology is preliminarily studied from the historical viewpoint. Tree avenues represented the oldest example to join vegetation and modern infrastructures. In the mid-19th century, whilst the continental European countries experienced the first planned



Planting design along roads and new developments in Nuremberg (Germany)

urban growth, the English and American public parks met further social and health needs, and developed innovative space-use relationships.

Several ecological benefits are offered by green areas in urban environments, including storm-water management, bioclimatic aspects, and biodiversity conservation. Both planting design and management are essential to achieve such results, to ensure that the transport system, the community needs and the plants could coexist in urban environments.

KEY WORDS

Environmental heritage, infrastructures, typology, landscaping

Riempire le infrastrutture e i vuoti urbani: tipologie di aree verdi

Questo articolo mira ad evidenziare la varietà e le funzioni delle aree verdi nei contesti urbani, concentrandosi su quelle interrelate con le infrastrutture, come componenti del patrimonio ambientale.

Lo studio tipologico è innanzitutto analizzato dal punto di vista storico. I viali alberati hanno rappresentato il più antico esempio di unione della vegetazione con le infrastrutture moderne. A metà del XIX secolo, mentre i paesi continentali europei sperimentavano la prima crescita urbana pianificata, i parchi pubblici inglesi e americani rispondevano ad esigenze sociali e igieniche, nonché sviluppavano relazioni innovative tra spazio e uso.

Numerosi vantaggi ecologici vengono garantiti dalle aree verdi negli ambienti urbani, compresi la gestione delle acque meteoriche, aspetti bioclimatici e la conservazione della biodiversità. Tanto la progettazione quanto la cura del verde sono essenziali per raggiungere tali obiettivi, per assicurare che il sistema della mobilità, le necessità della collettività e le piante possano coesistere armoniosamente negli ambienti urbani.

PAROLE CHIAVE

Patrimonio ambientale, infrastrutture, tipologia, sistemazione paesaggistica

Filling infrastructures and urban voids with nature: green areas typology.

Paolo Camilletti

Introduction

The European Landscape Convention (2000) highlights an evolution of the concept of landscape, read as a whole and acknowledged as a cultural heritage of a geographic region and its population. Such identity is generated by the complexity of its components and the relationships among them.

With regards to urban policies to enhance the sense of community and its territorial link, much of the current debate focuses not only on conventional open areas – i.e. public and recreational grounds, squares, and so on – but also on minor spaces and linear elements, which are essential to apply the concept of green infrastructure.

The roads and the residential fabrics model the landscape, by following anthropic rules. Streets and their accessories belong to the landscape. Travelling represents a way to experience the landscape in function of temporal and spatial variables, being the human perception of surrounding spaces strongly influenced by transit speed. Consequently, the roads system not only transforms a functional need into material shapes, but also exteriorises its landscape value. It has a cultural instance insomuch as the combination of its components reveals the local population's architectural language. This cultural heritage is the response to different environmental issues which are specific for each country.

An historical overview: from tree avenues to public parks.

A significant use of trees to create allées in parks and urban avenues emphasised the axes of connection between cities and countryside palaces, villas or castles. This practice has been documented since the 16th -17th century over almost all of Europe and in some cases it designed as a layer over the territorial structure, as visible in old cartography. For instance, the Piedmont radial system of royal castles and axes around Turin was made evident with plantations of single or double rows of trees along the roads. Naturally, it underlined the status and power of the sovereigns, who considered themselves to be absolute owners of those territories and sought to convey this idea forcefully to all the foreign visitors.

Actually, from the landscape viewpoint the most significant change of thought happened in the 19th century, when the codification of knowledge in urban sciences and the industrial development shifted the attention to some contemporary issues, especially in recently created housing areas. The deeper urban transformations, the effects of which contributed to the birth of contemporary city design, were often required for functional purposes, such as keeping social order but there were also other claims: hygienic and recreational demands were coming to light all over Europe and America. To meet these demands, in addition to new public parks it was necessary to plan a network of avenues and squares with social and environmental functions. Since the first half of the 19th century, the term "promenade" has implied both a leisure activity and a spatial element expressly created for socialization.

With reference to the transformations which occurred between 1850 and 1890, the models which mostly influenced European urban design were Vienna, Paris and Barcelona. The demolition of the Viennese defensive walls led to the realisation of the Ring as a circumvallation which gathered services and functions: an interruption between the old city centre and the expansion zones, a green ring suitable for promenades, and a new urban axis where financial and commercial activities would find their location. One of the first aspects evaluated by its planners was the introduction of rows of trees making a green ring around the historic centre. Therefore, citizens were offered a new urban space to spend their working-time as well as their free-time, by integrating all the levels of transports commonly used that time: trams, horse-drawn vehicles, cyclists, pedestrians.

In Paris, the civic planner Georges-Eugène Haussmann demolished entire blocks of residential buildings to create a system of boulevards and squares, mainly to enable armed interventions in times of social disorder and to remove slums. Two aspects can be interestingly pointed out about the boulevard urban net of Paris: it always resulted in a massive presence of vegetation (multiple rows of trees, garden-squares), and its planning was so far-sighted as to allow transport engineers to locate underground lines without affecting views.

Unlike Paris's focus on the urban growth, the layout of Ildefonso Cerdà's plan for Barcelona systematically included landscaping works, sustaining the development of both private and public green heritage. In fact, looking at his orthogonal grid of streets and buildings it is possible to note community gardens at different scales as well as a wide and undifferentiated texture of courtyards within building blocks, even though, in practice, speculative pressures caused a general loss of these private green areas.

Analysing Frederick Olmsted's masterpiece, Central Park in New York, it is easy to realise that he classified different typologies of traffic according to their uses. Footpaths, cycle ways and horse-drawn vehicle lanes were separated. Central Park does represent a clear example of how the transport system might play a primary role in landscape projects. Furthermore, Olmsted had to plan several infrastructures to avoid coplanar crossings of users, and it enabled him to make the park embellished with stone, brick or wooden foot bridges and underpasses. The same scheme rules his designs of campus and residential districts, where the transition from street to house crosses a series of layers (bicycles and pedestrian paths), faces mitigation barriers (trees and borders), expands the space with lawns and eventually reaches the house.

During the last three centuries, the idea of parks for wealthy people travelling by carriages gradually changed to projects where the users, belonging to the middle and wor-

king classes, enjoyed walking or cycling there. That is why, in some urban parks which date back to the 19th century and have not experienced any restyling since then, it is possible to see an apparent disproportion of path widths. The evolution of transport systems inexorably leads to new spatial relationships.

Ecological implication of greening the infrastructural landscape.

Green areas have a remarkable ecological value, and generate a variety of benefits known as ecosystem services, which are much wider than the well-known ones - i.e. oxygen production.

A first aspect is that being permeable surfaces they contribute to limit an endless building construction, which is characterised by an increasing ratio between covered and open areas. The reduced ability of the soil to absorb precipitation is mainly due to the sprawl of city outskirts and new infrastructures (motorways, urban ring ways, intermodal centres), and at a large scale it can cause serious storm-water management troubles. However, some technological design solutions such as the use of permeable materials (alveolar cells, pre-compressed blocks or gravel) instead of continuous pavements in parking lots, might effectively lower the ratio of run-off to infiltration, helping to create sustainable urban drainage systems.

A second aspect is the function of vegetation masses, to be carefully considered given the ongoing climate changes. These volumes filter the solar radiation and limit the reflection of heat from horizontal surfaces (especially road asphalt) and vertical ones (façades), helping to reduce the heat island effect and energy for summer cooling. Further advantages are against polluted dusts and the impact of winds.

Eventually, green areas help to preserve biodiversity even in anthropic urban environments. They provide habitats for some species of flora and fauna, as widely observed in dense conurbations – specifically in marginal areas, defined "the third landscape" by Gilles Clément, where the lack of man pressure fosters the conservation of wild species. With reference to the wider construction of the ecological network, green avenues play a particularly important role by working as connective corridors between nodal elements.

Horticultural aspects in planting design.

One of the most evident peculiarities of landscape architecture arises from the essence of its components, among which plants play a primary role. Being living creatures, plants have a biological cycle, a set of needs influenced by several factors and a dynamic facies that remind us of the temporal dimension. It implies that there the spatial quality of the landscape can be affected by seasonal changes not only in terms of colours, but also surfaces and volumes generated by plantation patterns. Thus, plants are not only those living beings which hide unpleasant views and guarantee the visual quality of the landscape. There is still some hesitation about the acknowledgement of plants as elements of a "green heritage". This may be due to a common perception that artistic works are expected to last almost unaltered for centuries — with the exception of processes of degradation - whereas plants keep a natural course of life. Nevertheless, the green heritage offers its beneficial services to the local community; it requires analysis, care and valorisation.

Specific expertise in landscape design is essential: it is not uncommon to see the consequences of a superficial approach to ornamental horticulture in public green areas, causing damage or injury to the essential character of the landscape. It is therefore essential to find a synergy between all those people whose professions are related to this field (landscape architects, urban planners, horticulturalists, architects, engineers). Actually, planning these areas is not only a matter of architectural design: it must be accompanied by decisions about the species, distances, composition of planting schemes and sensitive long-term management by the gardeners. Then, as well as any other garden, they need maintenance since the opening. It is even more challenging in public areas, often monitored by GIS software.

A typology of green areas in the cityscape

Adopting a systematic approach, there are several types of elements which constitute the urban green heritage: rows of trees; squares; roundabouts, roads and rail accessory elements; parking areas; border spaces; derelict building or infrastructure sites.

There are trees plantations in avenues, with a primary (or urban) impact, and rows of trees in local streets. This hierarchy is determined by the horizontal dimension of the road section, the height and crown of the species, and the number of lines (only one in streets, often more than one in avenues). They can be planted on only side or two sides or in an axial position. Considering the species, there is a distinction between mono-specific and multi-specific lines (fig. 1). Although the traditional mono-specific line of trees is more effective in terms of visual homogeneity, ecological reasons support the introduction of multi-specific rows: a range of plants ensures that if a pest or a disease attacks only one of them, the major part of the line will survive. There might be also a cultural reason: mono-specific rows reflect architectural uniformity of language, but contemporary cities are characterized by a variety of styles even along the same road.

Roads and paths suitable for slow mobility are usually called greenways. The term comes from the fusion of greenbelt and parkway and it represents the attempt to connect green areas in an overall system which is complementary to the transport one. Amenity and low ecological impact connote greenways, whose precursors were Frederick Olmsted (Parkways, 1865) and Patrick Abercrombie (London's open areas Plan, 1943). Disused railways can be successfully converted into greenways (fig. 2).

Squares are typically places for social aggregation. Apart from different scales and shapes, there is a cultural difference between southern and northern European traditions.



Fig. 1 – Rows of trees in Corso Mediterraneo, Torino (Italy)



Fig. 2- Greenway in Andalusia (Spain)



Fig. 3 – Reichstag Square, Berlin (Germany)



Fig. 4– Roundabout in Reggio Emilia (Italy), designed by Silvia Ghirelli, 2001 (source: Isnenghi, Palminteri, Romitti, Donne di fiori, 2005)

The massive use of stone in the south is replaced by green surfaces in the north, as the recent project of the Reichstag square in Berlin highlights (fig. 3). The transitional gradient from building to landscape is wisely rendered by the increasing percentage of grass replacing stones and porphyry.

Some technical elements of roads now offer further opportunities to design the landscape. Roundabouts can vary from basic solutions (turf) to ornamental patterns (grasses, perennials, shrubs) or reference to the surrounding landscape especially if close to the countryside, including diffused productive plants (fig. 4). Lane dividers are often landscaped with positive consequences for drivers, cutting down the journey's monotony and reducing headlight glare. Trams that follow grassy lanes (fig. 5) are reality in several countries where asphalt is being removed. As the total surface occupied by their lanes is considerable, significant improvements of drainage during wet seasons and re-



Fig. 5 – Grassy tram lanes in Barcelona (Spain)



Fig. 6 – Parking area at the Alhambra Garden, Granada (Spain)



Fig. 7 – Wildflowers in a urban border space, Viterbo (Italy)



Fig. 8 – Natur-Park Schöneberger Südgelänge, Berlin (Germany)

duced reflection of radiation in summer can be registered.

Parking areas have been studied since the 1960s. Although improving drainage was the first consideration for years, landscape architects are realising how beneficial the analysis of the genius loci is in contexts of remarkable historic or natural value. Traditional materials and techniques can be a source of inspiration. The arabian-hispanic irrigation channels are re-interpreted at the Alhambra Gardens' car park in Granada (Spain, fig. 6). In this case citrus trees are not chosen as they are not suitable for the purpose, but are replaced by Cercis siliquastrum.

Border spaces are generated by the construction of new transport infrastructures (slopes, rising banks). It often happens that indecision or lack of funding do not allow a

transformation of these surfaces, which are rapidly colonised by the local flora, offering spectacular displays of native flowers (fig. 7).

Disused building and infrastructure sites represent another resource to improve the urban environment. Disused railway lines are frequently re-used as parks. Several of these ideas have been used in Germany: the restoration of Ruhr and urban parks in Berlin (fig. 8). The idea of movement can be expressed with a choice of both wild and exotic plants, competing to emerge and colonise wider and wider areas, and delivering never-settled landscapes to the community.

In conclusion, it can be stated that the process of integration between the systems of green areas and roads or rail transport can effectively contribute to enhance the quality of urban landscapes. In doing so, the conventional idea of the urban void may be reversed into an active part of the environmental heritage, as a source of ecosystem services. The level of complexity reached by wide contemporary conurbations requires a deep collaboration among all the disciplines involved in any urban or regional transformation. Therefore, a more effective sustainable development of urban areas should be supported by three operative phases: an accurate prevision of green elements in zoning plans, the research for innovative solutions, and the wise management of landscaped areas.

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