Landscape-Infrastructure:
shifts of meaning for changing cities

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Abstract

Given the current global situation and the problems we need to face, landscape architects are more than ever before confronted with the task of planning and transforming complex cultural landscapes. In the light of this awareness, many professional figures, have once again turned their attention to the large systems of infrastructural networks, that are key to the expansion and functioning of our cities, looking for effective solutions to find a balance between the demand for use and the sustainability and quality of urban environments. The operative landscape design category going by the name of Landscape Infrastructure*, marks a major change in the role that Landscape Architecture has played in relation to the production of urban and public spaces over the last century, by actively engaging the political agency, with new kinds of private/public partnerships, capable of creating new landscape super-organisms representing a genuine cultural shift.*

Keywords

Landscape Infrastructure, Landscape Architecture, Urban Space Systems.

Intro

The subject of the study conducted at the Department of Architecture of the University of Florence, during the years 2016/2018, going by the name of *Landscape Infrastructure for the XXIst century: New Identities for New Landscapes*, is the emerging practice of landscape design, which aims to provide operational solutions using an interdisciplinary approach and a systemic vision of the functioning of the urban environment, going by the name of *Landscape Infrastructure*. It is an operative category of the Landscape Architecture discipline, which bases its theoretical roots in the re-contextualization of the notion of landscape, focusing on the reciprocity of the relationship between landscape and infrastructure and the production and configuration of the urban environment (Bélanger, 2008, 2016). Indeed, the progressive interpenetration of urban areas with the landscape, and of environmental and landscape issues, have prompted new projects to work on the margins of specific design skills (Marinoni, 2006; Waldheim 2016, et al.), constituting important new challenges for the landscape architecture profession and for the disciplines that contribute to the production of urban environments. The first use of the term *Landscape Infrastructure* dates back to 2008, for such was the title of a public symposium focusing on the relationship of reciprocity between landscape and infrastructure, organized in response to the

> unchallenged predominance of civil engineering and the growing inertia of urban planning. (ASLA Honour Award, 2010)

The 2008 symposium, through its re-examination of the historically divided, technocratic nature of engineered infrastructure, formulated a more synthetic vision of 'Urban Infrastructure' as a landscape of artificial and natural elements which, along with global economic forces, unequivocally support the human habitat and are capable of evolution and change. The research therefore stems from the need to understand what this new design typology consists of and what the role of *Landscape Infrastructure* projects, in the processes of transformation and creation of cities, is today, striving to identify processes and operational tools by which interventions of urban transformation attributable to this design typology, can generate new landscape identities through the interaction of the various infrastructural (urban), cultural and environmental components.

Materials and Methods

The multiplicity of interpretations that the binomial infrastructure and landscape can take on constitute the starting point of the research. As emerges from

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the most recent debates on the contemporary role of the landscape project,

> what shows the lack of clarity, which is almost ever-present, in the substance of landscape projects and the ability to build relationships, is the fact that this is often confused with the tangled theme of sustainability in an out and out deceptive process of greenwashing. (Cortesi, 2017)

This distortion of meaning and significance can be defined as interscalar and multilevel, since it expands to different categories of design and can be identified at an even more specific level, for example, when dealing with issues related to the relationship between landscape and infrastructure. It can be clearly noticed when dealing with planning strategies adopted to contrast the effects of climate change in urban environments, that assumed multiple names over time: "Green Infrastructure", "Green Urban Infrastructure", "Green & Blue Grids", being the main ones. Although these strategies have been put into practice in different ways and in many cities around the world, research showed that to date there is no shared definition of the terms. Nevertheless, in all of these strategies linked to the sustainability of urban environments, it is noticeable a marked prevalence of attention

> for the protectionist and safeguarding apparatus to the detriment of the transformative and innovative intrinsic power of the landscape project. (Cortesi, 2017)

they all focus on the optimization of ecosystem services, an approach which is based on the functional value of nature, measuring it by calculating the components of our world and habitats as separate entities, attributing to them a price to better value them in the future (Weilacher, 2017). The use of the add-on 'Green', refers to a traditional and stereotyped reading of the landscape, which is definitely outdated. Landscape has been 'removed' from the discussion and replaced with 'green' and 'blue' as the only possible colours representing 'nature' in urban areas, thus leading to the risk of huge steps backwards form the 'colour-neutral' understanding promoted for many years by urban ecologists and landscape architects, which have been stressing the fact that it is impossible to secure the 'natural life support system' of a city with just green or blue areas alone, but, on the contrary, the complex variety of all urban biotopes (be they green, grey, blue or of any other colour) have to be respected and developed (Corajoud, 2011; Weilacher, 2017). This does not mean that a landscape architecture project cannot be a part of 'Green Infrastructure'; quite the opposite, as they are certainly a necessary asset with which to achieve the sustainability of a city, enhance

the quality of life of its inhabitants and improve and restore the ecological systems and processes in urban areas, but, a landscape project that deals with infrastructure cannot be, by itself, considered or named (Urban) Green (and Blue) Infrastructure. The association of the two terms landscape and infrastructure, constitutes an interesting structural coupling between material and symbolic, between implicit uses and meanings, between forms of appropriation and signification processes, which goes beyond the most frequently used terminological slogan; it fits into the spectrum of new urban practices which, by overcoming the reductionism of traditional functional categories of urbanism, can connect the physical, material, cultural and symbolic dimensions, inherent in the urban environment. The multiplicity of interpretations that the binomial infrastructure and landscape can take on, thus constitute the starting point of the research. This paper sets out to demonstrate that the concepts of landscape and infrastructure, though generally associated with two different cultures which are almost antithetical, can rather constitute a tautology in the context of the contemporary discussion on the re-configuration of the city. The method of investigation is of inductive type, focusing on the semantic dimension of the terms 'landscape' and 'infrastructure', identifying and describing different ways of reading each of the terms through a critical literature review, striving for the establishment of patterns of association between the two concepts, that constitute the theoretical foundations underpinning *Landscape Infrastructure* design.

Findings

The investigation has shown that, especially during the 80's and 90's, many prominent researchers re-examined, the substantive meaning of landscape, moving away from the 'modernist' vision and shedding the inherently territorializing concept of landscape, which for many years had laboured under a distorted meaning, with the aim of expanding its meanings for a broader interdisciplinary discourse. One of the first ground-breaking declarations, which perfectly captures this shift in attention towards landscape and its meanings, is contained in 'Townscape', written by Gordon Cullen in 1961, who defined the "city as a particular form of landscape". This postulate marks a clean break with the context and tradition demonstrated by the reductive interpretations of functionalism. According to Cullen, the urban project had to guarantee the city the same values of visual recognizability as the Renaissance city, achievable through the correct configuration of the spaces where the daily life of a given community takes place[1]. The consideration

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of the city as a particular form of landscape implies the adoption of a different conception of what the term landscape means, clearly in contrast both with the 'traditional' concept focused mainly on natural beauty and aesthetics as per the definitions of Benedetto Croce or Joachim Ritter,and as geographical conception of part of the Earth's surface. In order to clarify the confusion generated by these diverging approaches, many scholars re-examined, in the historical and geographical context, the substantive meaning of landscape,

> as a place of human habitation and environmental interactions. (Olwig, 1996, p. 630)

in an exploration of the evolution of the notion of landscape, focusing on the unnaturalness of landscape (fig. 1).

The German term *Landschaft,* and the Dutch *Landschap,* are considered the terms from which the english word *Landscape* derived, at the turn of sixteenth century, evolving from *Landsceap* and *Landscipe.* At that time the two words were used to mean a district, a tract of land, a region or a country, more in general a 'restricted piece of land', rather as the Romance-language versions of the word, *Paesaggio* in Italian, *Paisagem* in Portuguese, *Paisaje* in Spanish, all derive from the latin *Pagus* meaning "a defined rural district".

The French, in fact, have several words for 'landscape', each with shades of meaning: 'terroir', 'pays', 'paysage', 'campagne'. In England the distinction was once made between two kinds of landscape: woodland and champion – the latter deriving from French 'champagne', meaning a countryside of fields. (Jackson, 1984, pp. 5-6)
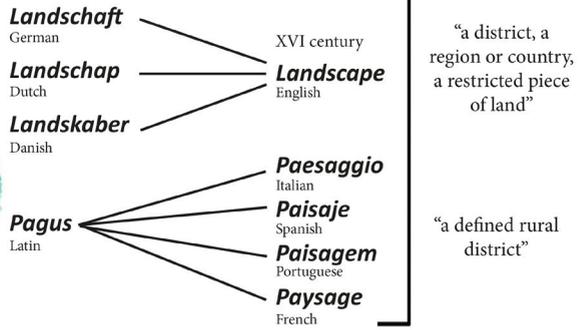
The etymological studies conducted first by Stilgoe (1982), then by Jackson (1984) and Olwig (1993), have amply demonstrated how, in reality, these terms did not indicate only a certain territorial unity, but contained, in their North-European root,

> meanings of great importance to the construction of personal, political and place identity. (Olwig, 1996, p. 631)

Even though it is true that, in Danish, the word *Landskaber* indicated a determined administrative territory, the Danish term shares, with *Landschaft, Landschap* and *Landscipe,* the combination of two roots:

- *Land* indicates "A space defined by clear boundaries, even if not physical" (Jackson, 1984, p. 6), therefore signifies both place and the people living in that place (Jackson,1984; Olwig, 1996; Whiston Spirn, 1998; Leatherbarrow, 2017);
- *Skabe* and *Schaffen* mean "to shape"[2] and the dutch *Schappen,* although the term is no longer in use, meant "to shape" referring to the Biblical sense of 'creation' (Jackson, 1984; Olwig, 1996; Whiston Spirn, 1998);

LAND - SCAPE

	XVI century	"a district, a region or country, a restricted piece of land"
Landschaft German		
Landschap Dutch	**Landscape** English	
Landskaber Danish		
	Paesaggio Italian	
Pagus Latin	**Paisaje** Spanish	"a defined rural district"
	Paisagem Portuguese	
	Paysage French	

Land	**Skabe / Schaffen /Schappen**	**-skab, - schaft, -ship**
«A space defined by clear boundaries, even if not physical», meaning: both **place** and **the people** living in that place	mean: "**to shape**" X century: Waterscape, Housescape	mean "**association**", "**partnership**" composition of similar objects, but also **an organization** or **a system**

- The suffixes -*skab* and -*schaft,* as in English -*ship,* also mean association, partnership (Arther, Borden, 1982; Whiston Spirn, 1998).

The varied understandings of the word landscape (scenic, territorial and constructed domain for social community), have in common the fact that planning is the basic task needed to create them. The fact that the word *Land* (also a component of *landscape*), due to its etymological roots, couples territory with created structures of coexistence, confirms that a landscape is a performative product of its environmental and social operations, a result of constructive intentions, which possess strong power of configuration of the space. Through the recognition that landscapes exist through the labour of construction, the landscape historian John Brinckerhoff Jackson, re-defined its significance:

> A landscape is not a natural feature of the environment but a synthetic space, a composition of man-made or modified spaces to serve as infrastructure or background for our collective existence. (Jackson, 1984, p. 8)
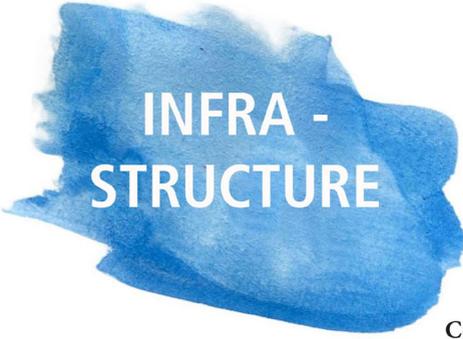
This definition is still considered by many distinguished scholars as the most suitable for reading contemporary landscapes because it offers a very useful tool for analysing all types of contemporary landscapes simultaneously, taking into account the value of time, memory, experience, sequence and structure, gathering both the material and symbolic meaning of landscape. Indeed, it constitutes a "spatial and cultural turn" (Cosgrove, 2004) that moves from a functionalistic, predetermined and fragmented approach to one that is holistic and interdisciplinary, in which landscape is conceived of as a "fluid continuum of interweaving systems" (Angélil, Klingmann, 1999); in other words as the complex sum of the products of those who design it, thereby opening out the field of infrastructure design to landscape architects and architects. In brief, it can be argued that a city is a landscape that
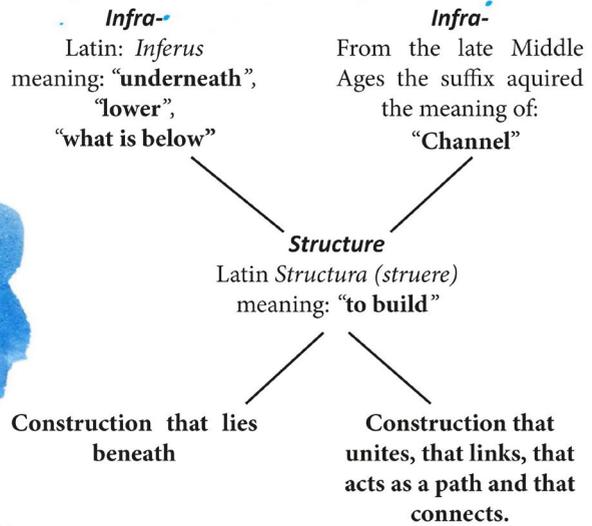
> is shaped by technological shifts and changes in patterns of social interactions. (Sudjic, 2016, p. 27)

Cities possess dynamic qualities as much as every type of landscape, they have the ability to change and evolve over time, which is why to ensure their existence

> we are faced with the necessity of evolving structures and forms which can develop in time, which can remain a unity and maintain the coherence on the components at all stages of their growth. (Bodegraven, 1952)

INFRA - STRUCTURE

Infra-
Latin: *Inferus*
meaning: "**underneath**",
"**lower**",
"**what is below**"

Infra-
From the late Middle
Ages the suffix aquired
the meaning of:
"**Channel**"

Structure
Latin *Structura (struere)*
meaning: "**to build**"

Construction that lies beneath

Construction that unites, that links, that acts as a path and that connects.

CONTEMPORARY INFRASTRUCTURE:

"the underlying foundation or basic framework (as of a system or organization)"
(Merriam Webster Dictionary)

Through this vision cities can be interpreted as 'synthetic' landscapes formed by an intertwined set of structures resulting from diverse and competing forces, cultural and natural, whose patterns vary in response to the specific context. This awareness leads to new design strategies that are based on the acceptance of the hybrid nature of these landscapes and the idea that landscape (and the discipline of landscape architecture) can be the opportune 'tool' to work with natural processes, structuring new hybrid relationships and interactions among the things it supports (Corner, 1999; Wall, 1999; Mossop, 2006; Bélanger, 2008; Guldi, 2012; Jakob, 2012; Weilacher, 2017; et al.), prefiguring ideal concepts of landscape as meaningful infrastructure. Etymologically, the term infrastructure derives from the Latin *infrastructura* (fig. 2).
It is made up of the suffix *infra-* meaning *underneath*, *lower*, more in general *what is below*, and *structura* meaning

> the constitution and the distribution of the elements which, in a relationship of association and functional interdependence, form an organic complex system or a part of it (*Treccani*, 2018)

which derives from Latin *struere* meaning to build. The literal meaning of the word infrastructure is therefore "construction that is below, that cannot be seen". From the late Middle Ages, however, the suffix *infra-* acquired a different meaning in Latin: that of 'channel'. For this reason, infrastructure means not only "what lies beneath" but also a construction that unites, that links, that acts as a path and that connects. The image that best translates this concept is the architectural archetype of the *bridge*, which is able to join construction to nature by connecting two banks, two shores or two sides (Ugo, 1991). The word *bridge* derives from the Latin *pontem* (accusative of *pons-pontis*). Nevertheless, the Greek *pontos* and *patos* with which it means *passage*, *crossing*, deriving from the root *path* meaning *to go*. The Greek word *pontos* and the late medieval Italian word 'ponto' also means 'sea'; therefore it is arguable that the Indo-European root of the term is imbued with the concept of 'vastness' and 'passing', ie the 'sea' is also a path between the Earth and people (*ponto*), just as the 'bridge' (*pontem*) is a union of lands and people and the overcoming of an apparently impassable vastness. For

these reasons the German philosopher George Simmel considered the act of connection by the creation of paths, which visibly connect two places, as "one of the greatest human achievements" (Simmel, 1909, p. 6), while the 'miracle of the road' is the medium through which it is possible to accomplish the "freezing of movement into a solid structure" (Simmel, 1909, p. 6). Simmel's statement gives rise to the idea of the bridge as one of the most powerful pieces of infrastructure, making mankind feel connected, both aesthetically and practically, because

> the bridge gives to the eye the same support for connecting the sides of the landscape as it does to the body. (Simmel, 1909, p. 6)

Heidegger was similarly drawn to the archetype of the bridge:

> It is not limited to connecting two shores, but it is precisely the passage of the bridge that reveals them as such [...] It unites the river, the banks and the territory in mutual proximity. The bridge gathers the earth around the river as a region [...] it is a place. (Heidegger, 1951)

It follows that, since the word *landscape* is formed by *land* (a space defined by clear boundaries, even if not physical) and *-scape* (a composition of similar objects, an organization or a system), by the juxtaposition of the two terms it is possible to understand *landscape* itself as the *infrastructure* which

testifies the presence of human beings on the planet, or in the words of Jackson as:

> a man-made system of spaces superimposed on the face of the land, functioning and evolving not according to natural laws but to serve a community. (Jackson, 1984, p. 8)

Thus *Landscape* and *Infrastructure* can be considered as a tautology, because the two terms share the same task: they both constitute the means that allow us to enter in relation to the space that surrounds us and in which we carry out activities. Just as landscape does, so infrastructure establishes a connection between culture and nature. This is especially the case in the interpretations of many scholars[3], who have preferred the use of linguistics to formulate new theoretical fields to improve their understanding of the structure of urban landscapes, simultaneously acknowledging the potential for appropriating infrastructure as landscape and vice-versa. One of the most important contributions of linguistics to the field of architecture was made by the Swiss linguist and semiologist Ferdinand de Saussure (1857, 1913), considered one of the founders of modern linguistics, in particular of that branch known as structuralism. Language, for de Saussure, is a system of signs where "the value of one is not that of the simultaneous presence of others" (de Saussure, 1916). Each sign must be consid-

ered only in the whole system of which it is a part because "the word depends on the system, there are no isolated signs" (Ibidem). A structure is a system of pure values organized according to principles of regulation that constitute the schemes or internal laws of its operation. In fact, echoing de Saussure, the Structuralist Architects adopted the following definition of *structure*:

> A structure is a complete set of relationships in which the elements can change, but in such a way that they remain independent of the whole and retain their meaning. The whole is independent of its relationship to the elements. The relationships between the elements are more important than the elements themselves. The elements are interchangeable, but not the relationships. (Luchinger, 1981)

It is evident that this theoretical approach has nothing, or very little, to do with the rigid architectonic framework which configured the practical applications of Structuralist and Metabolist architects in the second half of the twentieth century; the definition of *structure* given above actually describes a mutable system, one in which the relationships of the elements change over time, very similar to the complex ecological systems described in the works of Howard T. Odum in the 70s and, as empirical evidence, to landscape (Lister, 2007). Among the cluster of authors, belonging to diverse disciplines, which tackled this issue, the French philosopher
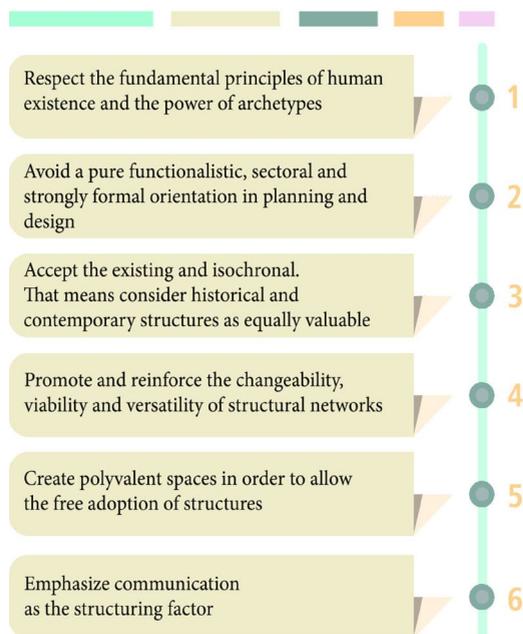
Gilles Deleuze recognized structuralism as an actual non-verbal language of signs. With this in mind, landscape becomes the mediatic discipline capable to create a new syntax for reading the city as a product of interweaving and interdependent systems: the one of nature, which speaks the language of ecology, and the one of culture, or in this case infrastructure, which speaks the language of technology.

> If architecture is declared landscape, infrastructure is declared architecture, and landscape is declared infrastructure, the precondition is created to understand the phenomenon of the city otherwise. (Angélil, Klingmann, 1999, p. 20)

From this point of view landscape acquires the role of a massive, muscular and strong 'superorganism' which shapes the world. The redefinition of the landscape as a complex living organism and no longer as a "green work of art" (Weilacher, 2017), logically implies that one of the most important features of the landscape is the existence of complex networks. These structural networks, such as water systems, traffic systems, as well as green space networks and ecological living systems, are the components that ensure the liveability of today's landscape and are

> complementary and reinforce each other through a relationship of interdependence and mutual permeation. (Weilacher, 2016, p. 252)

SIX RECOMMENDATIONS BY STRUCTURALISTS

1. Respect the fundamental principles of human existence and the power of archetypes

2. Avoid a pure functionalistic, sectoral and strongly formal orientation in planning and design

3. Accept the existing and isochronal. That means consider historical and contemporary structures as equally valuable

4. Promote and reinforce the changeability, viability and versatility of structural networks

5. Create polyvalent spaces in order to allow the free adoption of structures

6. Emphasize communication as the structuring factor

As a result, it is even clearer that it is no longer necessary to discuss whether infrastructure can actually generate landscapes, as happened in the past, because, in this light, the infrastructure is, in itself, a constituent part of the landscape. In this regard, Professor Udo Weilacher, in more than one occasion, has suggested to Landscape Architects to reconsider some of the theories of structuralism and adapt them to the contemporary expanded field of Landscape Architecture and has set out a set of 6 principles (fig. 3).

The principles suggest to adopt a strategy consisting of a

> highly organized plan (spatial, programmatic or logistical) that is at the same time flexible and structurally capable of significant adaptation in response to changing circumstances [...] a robust and evolving open system (Corner, 2014, p. 285)

that, in order to grow and develop, must both persist and change, so that the design of its organizational structures must be sufficiently strong to withstand challenges while also flexible enough to morph and reorganize. This line of thought confirms both the hypothesis advanced by Alex Wall in the 1990s that an urban surface, "through the grafting of new tools and structures, can be transformed into a living connective tissue between fragments", bringing to the infrastructure the character of collective space,

> relevant for the vitality and experience of the contemporary metropolis (Wall, 1994, p. 246)

and the one advanced by the Spanish Landscape Architect Diana Balmori in her *Landscape Manifesto*:

> Landscape – through new landscape elements – enters the city and modifies our way of being in it. (Balmori, 2010)

This involves a broader systemic thinking concerned with ecologies of dynamic change, adaptability, resilience and flexibility, through a method based on the antithetical conception of the baseline principles of urban planning and civil engineering that forms the functional architecture and regulatory framework that underlie the legislative governance and physical construction of cities today. Through the interweaving of processes and flows, existing systems and in situ spaces (often in conflict with each other), the design practice of *Landscape Infrastructure* aims to create active and functional landscapes, making a niche for species forced out of their original environment, guaranteeing security and allowing for a greater level of interaction (Bélanger, 2013; Hung, 2013). From this perspective landscape and infrastructure merge and are the vessels of collective life, aiming, this time, to enhance the quality of the landscape (Shannon, Smets, 2010; Nihijus, Jauslin, 2015). The ten-year debate underway on *Landscape Infrastructure* forces Landscape Architecture to re-consider systems and processes previously not associated with the discipline. This is because in this design field infrastructural systems and processes become the means to support new types of landscapes and new

understandings of how man structures his habitat in the Anthropocene Era, thus creating greater connectivity "for people in places, community in community, nature in the city" (Hung, 2013, p. 19) and contributing to the improvement of the quality of urban life. Nevertheless, the theoretical concepts underlying *Landscape Infrastructure* design contributes to the ongoing development of Landscape Architecture by generating continued discourse and new practices that reimagine infrastructure for the advancement of our culture.

Note

[1] An interpretation of the urban space that will be officially shared only 40 years later by the European Convention on Landscape.
[2] In *Discovering the Vernacular Landscape*, the American historian J.B. Jackson, gives several examples of this change of meaning: 'waterscape' was a word already used in the tenth century to describe the system of aqueducts, pipes and drains necessary for operation of a mill; 'Housescape' instead meant all the housework. This comparison highlights how *-scape* indicates not only a composition of similar objects, but also something like an organization or a system, demonstrating how, originally, the term landscape, does not indicate a scenario or a panorama, but rather the organization and composition of the spaces created by mankind on Earth.
[3] See C. Alexander (1977), P. Latz (1987), R. Williams (1993), G. Strang (1996), U. Weilacher (2017).

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