

**Urban Parks: from romanticizing to sanitation – from theory to reality**

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## **SUMMARY**

Urban parks have always accompanied the history of man. They represent the main areas for leisure, recreation and contact with nature in city environments. Identifying the formation and transition processes of these spaces reveals the influences that determined parks' profiles as they are today. This article sets out to trace the historical, conceptual and functional evolution of urban parks and identify tendencies in the typologies of new parks. The historical method is employed whereby investigations of processes in the past enable a verification of their influence on present day society. In the past, parks emerged to improve urban populations' quality of life in the post-industrialization period whereas, nowadays, parks seek to strike a balance between built up areas and natural ones. Against that background parks are a response to the needs and aspirations of the population in each historical period of its living experience. Currently the most frequently proposed park typology is that of 'linear parks' associated to water courses. Given the absence of spaces in cities that would enable the maintenance of ecological integrity in valley-bottoms, and the advanced state of degradation of those environments, new parks tend to be designed from a sanitation perspective as their functionalities can foster flood control by means of permeable areas, avoidance of irregular occupation by attributing new land use, and contributions to the quality of life by making leisure and recreation spaces available. This research contributes by systematizing the evolutive process and identifying tendencies in the configuration of new parks to address contemporary needs.

**KEYWORDS:** Environmental Planning; Green Areas; Linear Park.

## **1. INTRODUCTION**

Urban parks are public green areas destined for recreational and leisure activities. They represent a city's most emblematic spaces, and their evolution is intrinsic to urban development reflecting the needs and aspirations of the city's population.

The first parks were designed to satisfy the desires of royalty and their main function was to provide opportunities for landscape contemplation associated to the colors, rhythms and sequences of the landscape, an activity with cultural roots in romanticism. Today, urban parks are designed to address urban problems such as flooding and the occupation of risk areas (steep slopes and valley bottoms), and the need to recuperate degraded areas and to serve as a refuge for the human psyche. That trajectory from the romantic park to the remedial/curative park was made possible and molded in the course of centuries by planning and management of those spaces as well as by the urban population's needs and its appropriation of them.

Gaining an understanding of the formation and transition processes of these spaces enables us to bring to light the influences that determined parks' profiles as they are today, to identify society's current needs in regard to these areas and to set the guidelines for planning and administration measures.

## **2. OBJECTIVE**

This article sets out to trace the historical, conceptual and functional evolution of urban parks and identify tendencies in the typologies of new parks.

## **3. METHODOLOGY**

### **3.1 Method**

The research study adopted the historical method, as described by Marconi and Lakatos (2003), whereby investigations of processes in the past enable a verification of their influence on present day society insofar as the latter achieved its present form through

alterations to its component parts in the course of time, influenced by the cultural contexts of each period. In this case, an analysis based on the historical method leads to a better understanding of the genesis of park areas and of the role they perform in contemporary society.

### 3.2 Technical-operational procedures

The ‘bibliographic research’ technique was also used. According to Marconi and Lakatos (2021a), it consists of gathering secondary data from “[...] all the publicly available bibliographic material concerning the studied theme, embracing isolated publications, bulletins, journals, reviews, research reports, monographies, theses, and printed or digitalized scientific articles [...]” (MARCONI; LAKATOS, 2021a, p. 213).

In the view of those authors, there are 8 distinct stages in bibliographic research, namely: (i) choosing the theme (ii) elaborating the work plan; (iii) identification; (iv) localization; (v) compilation; (vi) annotation; (vii) analysis and interpretation; and (viii) writing up. These stages have been synthesized in Chart 1 below.

Chart 1: bibliographic research stages.

Stage	Characteristic
Theme	This is the subject matter to be addressed. It must be clearly delimited, that is, the subject and the object must be defined. <i>“The subject is the reality regarding which it is desired to know something [...]”</i> . The object <i>“[...] corresponds to that which it is desired to know or achieve in regard to the subject (MARCONI; LAKATOS, 2021b, p.48)”</i> .
Workplan	Elaboration of the workplan should consider the structure typical of all scientific work, namely: an introduction, development and conclusion as well as the formulation of the research question and hypotheses and the determination of the variables.
Identification and localization	This stage consists of recognition of subject matter relevant to the theme and the identification of the ‘catalogue’ of publications concerning it, that is, a search for books and specialized periodicals among others.
Compilation	This is the stage where all the material contained in the selected references is systematically gathered together.
Annotation	This stage consists of the transcription of the most important information obtained into a single physical or virtual document.
Analysis and interpretation	This consists primarily in making a critique of the bibliographic material, establishing a judgment of the value of a given text and, at a second moment, verifying the significance of the components of a set and their possible relationships. Later a generalization is made then an analysis and interpretation are constituted by the generalization, followed by a critical analysis by means of systematic and controllable processes and finally, the interpretation requires that the initial hypotheses or conjectures be either proved correct or refuted
Writing	This stage consists of the written expression of the results of the investigation.

Source: Adapted from Marconi and Lakatos (2021b).

In this research the stages of delimiting the theme and elaborating the workplan were joined into one. On delimiting the theme, the conjectures and questions the research would address were constructed. The delimitation of the heme was based on certain questionings: in what way have urban parks evolved up to the present day? What external agents have influenced their design and their functioning? Accordingly, the delimitation of the theme sought to present the history of urban parks and their different significances.

To address the research questions, it was decided to use the bibliographic survey

technique and, based on secondary data, present the urban park at each moment of its history. Later the study proceeded to the 'identification', 'localization' and 'compilation' of works that presented urban parks and their histories. The main databases used for that research were: Science direct (<https://www.sciencedirect.com/>); Scientific Eletronic Library Online (<https://www.scielo.org/>); Biblioteca Virtual Brasileira de Teses e Dissertações (<https://bdtd.ibict.br/vufind/>); Google acadêmico (<https://scholar.google.com.br/>); Portal de Periódicos da Capes (<https://www-periodicos-capes-gov-br.ezl.periodicos.capes.gov.br/>); printed and digital books and others.

A pre-reading of the material led to the selection of those that actually addressed the theme which were then read in detail and annotated to enable the most relevant and important passages associated to the theme to be cited. The systematic 'Analysis' and 'Interpretation' were achieved by means of the writing procedure which observed the chronological sequence of the parks' evolution while aggregating to it, the environmental (social, ecological and political) factors present in the living experience of each period.

## **4. RESULTS AND DISCUSSION**

### **4.1 The trajectory of the first parks**

The opening of the gardens of the English aristocracy to the public was what marked the creation of the first urban parks (MAYMONE, 2009). In some European cities, after the end of the 16<sup>th</sup> century, inhabitants were offered the opportunity to visit aristocrats' gardens. In that opening to the urban public, a new cultural model became consolidated, one of meeting and circulating in them in accordance with a codified ritual and it was those new habits that configured the transition from 'gardens' to the first public parks (PANZINI, 2013).

However, the first urban parks for leisure and recreation were only proposed in 1789 in Munich, utilizing abandoned areas and, actually, as a strategy for occupying vacant urban spaces. The idea of areas specifically dedicated for the use of the population was only conceived in the 19<sup>th</sup> century and involved projects in areas belonging to the British Crown (St. James Park and Regent's Park/1828) (MAGNOLI, 2006).

With the advent of industrialization and urbanization processes, the question of empty spaces lost its meaning. The height of the industrial era left deep marks on the European cities: increased populations, environmental pollution, housing and hygiene problems, long working hours, all of which constituted a deterioration of urban quality (OTTONI, 1966). In England, that scenario consolidated a new posture in regard to urban green spaces leading to the formation of urban parks with the primordial function of meeting the demand for leisure and recreation activities and it reached its peak in the decade from 1850 to 1860 with repercussions throughout Europe (ARAÚJO, 2007).

The source of inspiration for the English parks was the romantic idea of getting 'back to Nature' coupled with the influence of oriental Art and culture. In its evolution, the park began to incorporate picturesque elements and in English-speaking countries that new concept can be classified as the 'gardenesque' style and in France as the *paysager* style (ARAÚJO, 2007).

To this day London has extensive green areas formed by Saint James Park, Hyde Park, Green Park and Kensington Gardens. The last of these served as the inspiration for New York's

Central park created by Frederic Law Olmsted and Calver Vaux (1858), which came to address the then extant need for spaces to alleviate the overbearing presence of urban structures (ARAÚJO, 2007). It was a model that influenced all the parks of that period. In Brazil it influenced the Ibirapuera Park (São Paulo), the Pampulha Park (Belo Horizonte) and the Aterro Park (Rio de Janeiro); to this day it continues to serve as a model (ARAÚJO, 2007).

In the United States, antagonism to the poor quality of life in the cities stemming from urbanization and the exploitation of Nature gave rise to the conservationist 'Park Movement' inspired by the works of George Perkins Marsh and Henry David Thoreau (ARAÚJO, 2007) who exposed the degradation of Nature that accompanied anthropic activities and reinforced the idea of man's returning to a simpler way of life.

The 'Pleasure Garden' which typified Olmsted's projects is formed by vast expanses of open spaces alternating with placid meadows, waters interspersed among hills, and trees of a limited number of species, creating different sequences of winding spaces with bucolic pathways (MAGNOLI, 2006). It is the idealized countryside scenario; flowers are avoided insofar as they are reminders of man's presence, built areas are limited to pergolas and rustic stone 'vedos' dividing the terrain. Separate winding pathways for vehicles and pedestrians are another notable park feature of that period (MAGNOLI, 2006). There are no outstanding dynamic movements of the quiet waters, no startling contrasts in the stands of vegetation or details that might attract closer observation; the feeling of amplitude is always prioritized (MAGNOLI, 2006). They are parks where families can go to for walks, for boat or carriage rides, to listen to concerts or have picnics; they offer themselves as an antidote to the city (MAGNOLI, 2006).

Olmsted's works were not only the inspiration for innumerable parks around the world but the creation of those various parks also changed the concept of urban environmental quality (FRANCO, 2008).

In Brazil the creation of 'Parks Movement-type parks was tardy. The first national park with those characteristics was the Itatiaia National Park created in 1937 (FRANCO, 2008). It must be pointed out that the '*passeios públicos*', synonymous with 'public parks', created in Brazil between the end of the 19<sup>th</sup> century and the mid-20<sup>th</sup> century, such as the *Passeio Público do Rio de Janeiro* (1783) were marked by abandonment and the absence of users and only actually came to be accepted and frequented by the population at large around 1903 (BAHLS, 1998).

Great changes in the 'Parks' concept took place in the period 1900 to 1930 and it is known as the 'reform' or 'playground period'. Playgrounds and other local spaces for the local population are small spaces near residential areas and occupied by sandpits and spaces for play and physical exercise and they may also offer courses on hygiene or health or professionalization courses and, in the USA, guidance on naturalization for immigrants (MAGNOLI, 2006).

Between 1930 and 1965, the United States experienced a period marked by the 'recreation facility', when recreation became the focus of policy, and the intention was to provide it to all population segments. Innumerable leisure areas were implanted during that period and parks were the main attractions in that scenario (MAGNOLI, 2006).

It is therefore apparent that, in the course of decades, the parks were modelled and designed according to society's needs and aspirations.

## 4.2 The sanitizing park

Before thinking about the park as an element of the sanitation process it is necessary to define what is meant by sanitation.

Sanitation is derived from the Latin verb *sanare* meaning to make sanitary or healthy (Cunha, 2010), thus sanitizing means making it possible for something to become sanitary or healthy. In that light, urban parks need to be planned and managed as sanitation infrastructure, given that the benefits associated to them are intrinsic to public health and, as infrastructure, they are just as important as water supply and sewage treatment and solid waste collection and disposal.

The concept of planning a city with green areas for sanitation purposes stems, in essence, from post-industrialization England at the end of the 19<sup>th</sup> century due to the population's demand for a healthier city.

According to Ebenezer Howard (1996) the driving force behind urban problems was migration, as the cities grew so rapidly they could not support the new populations. It was necessary to integrate countryside and city and based on that principle and with a bias towards urban environmental sustainability, Howard put forward his 'garden city' concept and project published in 1898. His proposal offered an alternative for addressing the problems being faced in post-industrialization England. The idea of countryside and gardens permeating the built areas was always present in the projects of Ebenezer Howard (1859-1928).

Howard (1996) conceived sanitizing ideas such as: green belts around the perimeters of industrial areas to assuage noise and pollution levels, the proper destination of organic waste as compost for agriculture and gardening, and the establishment of new cities in nearby regions interconnected by roads and railways when a city reaches the maximum population level it can support.

The first garden city in England, Letchworth, was planned in 1903 and the second, Welwyn, was installed in 1919. Although the garden city was to have repercussions on other urban spaces in the world, the totality of a garden city concept in regard to the cooperative, economic and social principles was not always adhered to.

In Brazil that influence was manifested in various ways. In São Paulo, starting in 1913, the City of São Paulo Improvements and Freehold Company Ltd. was set up and began to plan central regions and neighborhoods on 'garden city' lines; in Rio de Janeiro, French urbanist Alfred Agache put forward a proposal for two garden cities, one on the Ilha do Governador and one in Paquetá, in addition to innumerable urban land developments that followed those principles, and in Atilio Correa Lima's plan for the city of Goiania (1933), the residential zone of the southern part of the city is constituted by curved roads interspersed with extensive vegetation (OTTONI, 1996).

In the state of Paraná, the North Paraná Lands Company (*Companhia de Terras do Norte do Paraná* - CTNP) and the São Paulo-Paraná Railway Company (*Companhia Ferroviária São Paulo-Paraná*), subsidiaries of the English Paraná Plantation Ltd. company (founded in London in 1925 and liquidated in 1944), in the area between present-day Londrina (little London) and Maringá, 'planted' those two cities and another ten influenced by the Garden Cities idea (Rego, 2009). In Curitiba, in 1943, there was an observably strong influence of the Garden City concept in the form of the Agache Plan carried out by urbanist Alfred Agache (IPPUC, 2011).

Various governments followed the example of the English model as a means to solving the situations of their industrial cities. Thus, sanitation principles began to stand out in the planning processes, constituting one of the first mechanisms of an urbanistic policy (CASTELNOU NETO, 2005).

Inserted in that scenario of places for contemplation and closer contact with the natural world, urban parks started to acquire functionalistic qualities, ranging from scientific interests and bourgeois collection-forming to the hygienist justifications that began to become increasingly frequent in urbanistic planning (CASTELNOU NETO, 2005). Many cities were restructured adopting measures that sought to expand and embellish spaces by widening thoroughfares and creating parks and squares (BAHLS, 1998).

In the population at large, that taste for 'verdure' developed the habit of cultivating flowers and trees. Gardens came to represent beautiful, quiet, harmonious environments; they were the antithesis of the city where the noise of the factories and the pollution barred the existence of a smooth and tranquil life for a population that had been accustomed to countryside scenery (BAHLS, 1998).

Vegetation, formerly banished from the urban areas, began to reintegrate with them. In the 19<sup>th</sup> century, gardens and parks were considered to be effective instruments for combatting the congestion and disorder of the big cities, embellishing the environment and serving as recreation areas, in addition to their sanitation aspects. Those new ways of thinking urban space diffused to the world at large (BAHLS, 1998).

In Brazil, on taking office as president in 1902, Rodrigues Alves put his campaign promise of sanitizing the then capital of Brazil, Rio de Janeiro, into practice. He nominated engineer Francisco Pereira Passos as mayor of the city (1903-1906) with the responsibility of effectuating the capital's urbanistic transformation. To that end, he contracted the doctor Oswaldo Cruz to carry out a complete sanitary reform (BAHLS, 1998).

Oswaldo Cruz elaborated a detailed Sanitation Campaign. His sanitation precepts included the designation, in the individual domestic environments, of separate areas for washing clothes and preparing food and the protection of domestic stored water from insects. He also determined the compulsory vaccination of the population and the preservation of green areas. The project also provided for populating parks and gardens with trees to make such spaces more attractive (BAHLS, 1998).

A good example of an urban park designed for sanitation purposes is the 'Passeio Pública' in the city of Curitiba. Prior to becoming a park, the area was an urban 'empty space' in the form of a soggy heath. That space was revitalized and came to be Curitiba's first park, inaugurated in 1886. It was the city's first large-scale public sanitation work and transformed an area with the aspect of a bog which, according to reports of the day "gave off smells and attracted disease carriers", into a space for leisure and contemplation (CUSTÓDIO, 2006).

A century later, in 1971, with the aim of introducing the idea of making better use of the green areas in the city of Curitiba, the then mayor, Jaime Lerner, inaugurated three large parks, Birigui, São Lourenço and Barreirinha, combining environmental conservation, sanitation and leisure space provision (CUSTÓDIO, 2006). The artificial lakes of Barigui and São Lourenço have the function of regularizing water flows and consequently help to control flooding (CUSTÓDIO, 2006).

The expressions of urban parks' sanitation functions include flood control, improved landscape aesthetics, microclimatic improvements, noise abatement and better air quality, among others. Many of the sanitation benefits accruing from urban parks stem from the extent of their permeable surfaces and from the presence of arboreal vegetation. The arboreal vegetation has various effects on the microclimate. It mitigates solar radiation in the hot season, alters the air temperature and relative humidity by providing shade, reduces wind speed and direction and serves as an acoustic barrier.

Cheung *et al.* (2021) made a study of urban parks in Hong Kong and found that a 10% increase in vegetation cover made up of trees and bushes led to a drop in the average temperature of from 0.04°C to 0.07°C; the transpiration of the trees is responsible for 30% of air temperature reduction and shade for the other 70%. The permeable areas of urban parks intercept and retain rainwater in the soil; plants attenuate the drying of the air caused by excessive paving of the soil given that the evaporation of the water intercepted by plants helps to humidify the air (BARBOSA, 2005).

The vegetation acts as a biological filter in the conversion of carbon dioxide to oxygen during photosynthesis. The fixation of particulate matter present in the air is achieved by mechanical means: the particles are sedimented on the plant surfaces and fixation takes place through contact of the particles with water droplets present in the plant (Barbosa, 2005). Spaces with vegetation in the city can absorb from 60 to 70% of dust in suspension in the air, varying according to the species of vegetation and the season (BERNATZKY, 1978).

In addition to the abovementioned environmental services, those spaces provide social and psychological services insofar as they stimulate physical activities and social integration, factors that are crucially important for the inhabitability of the cities and the wellbeing of their residents (CHIESURA, 2004; JEON; HONG, 2015).

#### **4.3 The park today**

Urban parks perform multiple functions in present-day society. They have aesthetic, ecological and social functions and are considered to be the main leisure and recreation areas for the urban population (KLIASS, 1993; SOLECKI; WECH, 1995; SORENSEN *et al.*, 1998). In the contemporary city, the park plays the role of ameliorating potential environmental problems and that is especially evident in urban parks designed to protect fragile areas (steep slopes and valley bottoms), recuperate degraded areas and conserve forest fragments. Such 'new' parks are usually referred to as 'Ecological Parks' (MARTINS, 2014). Ecological parks take on a special role in the city environment insofar as they propitiate microclimate improvement, air quality improvement, reduction of surface water runoff and rainwater infiltration, and, when they are well planned and distributed, regularization of water flows.

It is important to underscore the primordial function of urban parks in the recuperation of degraded areas. Examples are the Villa Lobos Park (a former open cast mine and waste dump), the Cidade de Toronto Park, the Ibirapuera Park, and the Tietê Ecological Park (BITAR, 1997), all of which are former mining areas and located in the Municipality of São Paulo. Their example is repeated all over Brazil.

According to Costa (2011), urban parks are synonymous with good quality of life and even with status; they can be considered as being the locus of interaction between urbanization



and the natural resources within a big city. Accordingly, the parks need to perform leisure, ecological and aesthetic functions. To do so, they are made up of aspects of a material nature (numbers of benches, courts, picnic areas, toilets), natural elements (wooded areas, lakes, climatic conditions, presence of animals) and furthermore by parameters of an immaterial nature (controls, feelings, emotions, conflicts, collective imagery and group identities) (NUNES JÚNIOR, 2011).

Thus we can classify present-day urban parks according to their main function. The literature reports, however, that parks classification and typology are still merely incipient and ambiguous; different authors propose different concepts for parks that perform identical functions and have the same design.

Mantovani (2005) suggests that three types of urban parks can be distinguished: (i) technological parks; (ii) garden parks; and (iii) ecological parks. Bonduki and Ferreira (2006) classify parks according to their location in the urban fabric: (i) intraurban nuclear parks; (ii) city parks; and (iii) linear parks. Whately *et al.* (2008) classify them according to their preponderant functions: (i) natural; (ii) historical; (iii) leisure; and (iv) linear. Kliass and Magnoli (2006) propose a classification based on the park size: (i) neighborhood park; (ii) district park; (iii) 'sectorial' park; and (iv) metropolitan parks (equivalent to the regional parks that Bonduki and Ferreira (2006) refer to) (Chart 2).

**Chart 2: Classification of urban parks according to typology, characteristics and authors.**

Typology	Characteristics	Author
Technological Parks	They have small areas, furnishings for public use, but no notable natural elements; some have no biological elements present at all.	Mantovani (2005)
Garden Parks	The biological elements have important functions and are continuously managed and maintained	Mantovani (2005)
Ecological Parks	Natural ecosystems are conserved in their entirety, performing their natural functions.	Mantovani (2005)
Intraurban Nucleus Parks	They propitiate leisure activities in environments with vegetation and can be classified as neighborhood parks, district parks or regional parks.	Bonduki and Ferreira (2006); Kliass and Magnoli (2006)
City Parks	Furnished with socio-cultural-sports equipment, they have areas suitable for big events, areas for picnics, gymnastic equipment, recreation equipment, greenhouses, nursery gardens, benches tables, walkways for pedestrians, cycleways, games areas, poly-sports courts, administration area, toilets and other installations.	Bonduki and Ferreira (2006)
Linear Parks	These are green areas associated to water networks. They have an extensive elongate configuration accompanying the water courses	Bonduki and Ferreira (2006) Whately <i>et al.</i> (2008)
Natural Parks	They permit the integration of natural systems such as water resources and vegetation and present potential for recuperation and maintenance of areas.	Whately <i>et al.</i> (2008)
Historical Parks	These parks present historical elements such as museums and officially recognized historical heritage entities	Whately <i>et al.</i> (2008)
Leisure Parks	Their main attractions are recreation and leisure equipment. They have areas with implanted vegetation and little or no integrity of natural resources.	Whately <i>et al.</i> (2008)

Source: Elaborated by the author, 2021.

It must be pointed out that what Whately *et al.* (2008) refer to as natural parks have similar characteristics to those that Mantovani (2005) calls ecological parks

The linear park consists of a zone of environmental protection and its object is to protect or recuperate the systems that line water courses on either side, conserve the gallery forest vegetation, connect existing green areas, control flooding and provide areas for leisure opportunities (BONDUKI; FERREIRA, 2006). Because of their multiple functions there is an observable tendency to implement such spaces in Brazilian cities.

An example is the city of São Paulo where the The [Municipal] Department of Verdure and the Environment (*Secretaria do Verde e Meio Ambiente*) (SÃO PAULO, 2020) and the Department of Infrastructure and Environment of the State of São Paulo (*Secretaria de Infraestrutura e Meio Ambiente do estado de São Paulo*) (SÃO PAULO, 2021) have listed 113 municipal and state-administrated urban parks. 23 of them are described as linear parks and were inaugurated after 2007. However, an analysis of all the listed parks located along water courses or in valley bottoms inaugurated in different periods shows that 83 of them are situated either near to or along the banks of water courses, springs or the main thalwegs of valleys even though they are not referred to as linear parks on the sites of the state and municipal governments.

#### **4.4 Linear Park; the park of the future?**

It is important to point out that the ascension of linear parks in Brazil only began at the beginning of the 21<sup>st</sup> century, unlike Europe and North America, where it took place in the mid-20<sup>th</sup> century. Frischenbruder and Pellegrino (2006) report how the planned cities of the 20<sup>th</sup> century like Londrina and Maringá (Paraná), Goiânia (Goiás), São José do Rio Preto (São Paulo) and even Brasília introduced the concept of linear parks in the urban fabric and left them for the protection of the edges of water courses but most of those environments were not effectively occupied by parks or gardens and ended up being occupied for residential and institutional purposes in the decades that ensued.

The linear park is an excellent tool for addressing the problems of contemporary cities because it attributes a new use to areas that have previously been areas of conflict in the city, namely, the valley bottoms. Their implementation makes it possible: to mitigate potential problems such as the irregular occupation of fragile areas, to include marginalized and degraded areas, to control flooding, to increment biodiversity and enable their potential use as ecological corridors by the local fauna species, to offer areas for leisure and recreation and to achieve microclimate improvements, among other possibilities.

The linear parks reflect the needs of the contemporary city but their origin goes back many years beginning with the 'greenways' concept. Searns (1995) states that the greenways first appeared centuries ago and the form they have today is the result of their adaptation to the evolution of the urban landscape, representing responses to physical and psychological pressures stemming from urbanization. They help to attenuate the loss of 'natural space' and provide a counterweight to the built-up landscape.

Prior to examining the concept, however, it is necessary to demonstrate the evolutionary process. To arrive at their present-day form, the greenways passed through a series of different formational stages. In his delineation of the evolution of greenways, Searns (1995) identifies three distinct stages as shown in Chart 3 below.

**Chart 3: Evolution of the Greenways, according to characteristics and generation.**

Generation	Characteristics
First 1700 – 1960	The ancestors of the greenways were the axes, avenues and thoroughfares that linked the first urban spaces. The denomination 'greenway' was not given to the first generation but they were the archetype for the attractive corridors that opened the ways within the city. An example are the landscaped axes and avenues of the European cities and later the roads built at the end of the 19 <sup>th</sup> century in the USA.
Second 1960 – 1985	These were parks based on trails for recreational purposes with a predominance of vegetation. They were linear and gave access to rivers, streams, hilltops, watersheds, former railroad beds and other corridors. The most important emphasis, in the case of those greenways, was on the greenery and non-motorized mobility.
Third from 1985 on	These are green areas with multiple functions that must address the needs of wildlife the necessity of reducing the harm stemming from floods, improving the quality of water, and education, as well as the need for recreation and the embellishment of the urban environment.

Source: Searns, 1995. Org. by the Author, 2021.

It can be seen that the main difference between the second and third stages is that in the second the attention is mainly on man and the greenery is expected to satisfy the needs of the human psyche, whereas the third includes concern for the biota as a whole and environmental and sanitary quality.

The trajectory of the greenways enables us to classify them as urban parks of the present day insofar as they perform social, ecological and physical functions.

Thus greenways are territorial units that are planned, protected and managed for multiple uses including: nature protection, biodiversity and water resource management, recreation and the protection of cultural and historical resources (AHERN, 1995, AHERN, 2002).

Ahern (1995) considers that there five key-ideas contained in the definition of greenways that call for a more in-depth discussion (Chart 4). The definition of those five principal ideas enables us to view the greenways as a complex, variable, strategic approach to landscape planning (AHERN, 1995).

**Chart 4: The key ideas underlying the construction of the greenways concept.**

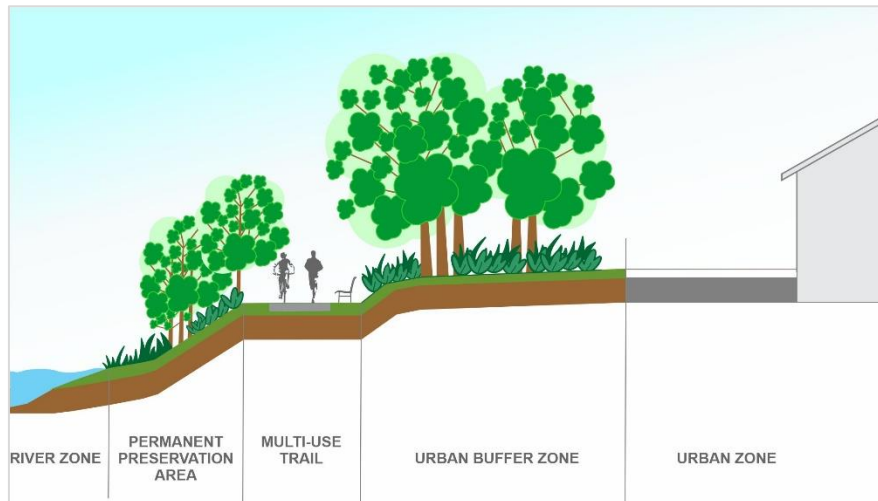
Key Idea	Characteristics
First	The spatial configuration is linear. They are planned according to the particular characteristics and opportunities of each environment; those which offer advantages in terms of movement and transportation of materials, species or nutrients. This is perhaps the single most important spatial characteristic of the greenways.
Second	Connection to other green areas is an essential characteristic and related to the greater landscape context. When a system is linked to others it may acquire the synergic properties of a network.
Third	They are multifunctional. That makes it necessary to establish planning goals and commitments that must reflect ecological, cultural, social and aesthetic aspects
Fourth	The greenways strategy is compatible with sustainable development insofar as there is complementarity between the protection of nature and economic development.
Fifth	The greenways represent a territorial planning strategy and should be considered as being complementary to the landscape and to the planning process.

Source: Ahern, 1995. Org. by the author, 2021.

The greenways are attractive to urban planning and to the public at large because of their simplicity; they do not seek to transform or control the entire landscape but concentrate on the riverside corridors and other fragile environments, strategically and synergically exploiting linear elements (AHERN, 1995). They are efficient, embodying multiple functions such as environmental conservation, recreation and leisure opportunities and sanitation aspects.

Figure 1 below represents the ideal greenway/linear park concept where the integration of multiple functions like conservation of the water channel and its marginal vegetation and the offer of recreational space is readily apparent.

**Figure 1: Cross-section of a linear park integrating conservation and public use.**



Source: modified from Ahern, 1995.

In the current Brazilian scenario, it is possible to observe linear parks with different characteristics. Bonduki and Ferreira (2006) propose three typologies for them associated to the peculiarities of each area. Each typology presents distinct attributes in the planning, dimensioning and implementation processes that are inherent to their initial physical and ecological integrity (Chart 5).

**Chart 5: Linear parks according to typology, characteristics and dimensioning parameters.**

Type	Characteristics	Dimensioning
Type 1 High degree of integrity	There is integrity of the riparian system with the presence of gallery vegetation or the possibility of its recuperation. It consists of a core Area and a Buffer Zone but may also include an Equipped Zone.	<u>Permanent Preservation Area</u> : minimum width established in accordance with the respective legislation. <u>Buffer Zone</u> : the dimensions are defined according to the specific biophysical demands of each case. <u>Equipped Zone</u> : the dimensions may vary according to the supporting capacity of the terrain.
Type 2 Moderate degree of integrity	There is a high degree of damage making recuperation of the original riparian ecosystem unfeasible with strips remaining sufficiently wide to receive pro-leisure landscaping treatment to attenuate the environmental impacts.	<u>Permanent Preservation Area</u> : non-existent or smaller than the legally required minimum. <u>Buffer Zone</u> : non-existent or dimensioned according to space availability. <u>Equipped Zone</u> : dimensions vary according to space availability.
Type 3 No integrity	The degree of damage along the banks limits the applicability of conventional landscaping; nevertheless, the original objective of ensuring water body connectivity must not be lost sight of.	Dimensioned according to space availability.

Source: Bonduki and Ferreira, 2006. Org. the Author, 2021.

It can be seen that the type 1 Linear Park seeks to preserve the characteristics of the riparian vegetation, so its overriding objective is the conservation and maintenance of the

ecosystem services.

The planning and dimensioning of the Type 3 Linear Park are directed at extremely anthropized and degraded areas where the space has lost its physical and ecological functions. That is the scenario for most of the water courses in urban networks where the morphology of the channel has been altered. Usually those channels have been rectified and canalized and their margins have been paved, or occupied by marginal thoroughfares and irregular housing. In that scenario, the main objective of the linear park is sanitation as it solves problems associated to irregular land use and periodic flood control.

There is a notorious difference between the Brazilian reality and the original concepts of linear parks and greenways. Pizarro and Lino (2012) consider that linear parks end up following the same logic as any other public square or even of any piece of land dedicated to a residential condominium. These parks have a ground plan that mixes semipermeable parts with others covered by grass where equipment for appreciation, sports and recreation are installed. They run the risk of being reduced to being mere statistics, leaving out of consideration altogether the importance of the quality of the environment and its importance for the various scales of the landscape (PIZARRO; LINO, 2012).

As regards the Brazilian scenario, there are very few studies of the efficiency of the design of those linear parks that have already been implanted. Most of the available literature consists of project proposals for the recuperation of rivers and streams by means of linear parks. Suzumura (2012) conducted a study of the Canivete linear park in the city of São Paulo and found that the project implanted along the areas adjacent to the riverbanks did not adhere to the principles of a linear park insofar as it paved over the land to make areas available for walks, leisure activities and sports. Nevertheless, even though the proposal failed to comply with the physical and ecological functions of a linear park, Suzumura (2012) concluded that it was a success because it achieved the removal of residential occupations of risk areas and improved the region as a whole by providing areas for walking, and sports and leisure activities in addition to acting as a barrier against any encroachment of urbanization in the direction of the protected areas.

It must be underscored that linear parks do not, in themselves, solve the environmental problems of the city. There has to be environmental planning of the entire basin involving the increase of permeable areas and green infrastructure. Furthermore, the linear park is not synonymous with an Area of Permanent Protection which, in the terms of the Brazilian legislation corresponds to *“an area, covered by native vegetation or not, with the environmental function of preserving the water resources, the landscape, the geological stability, and the biodiversity, and of facilitating the genetic flows of the fauna and flora, protecting the soil and ensuring the wellbeing of the human populations”*.

The ecological integrity of such areas enables the achievement of: an equilibrium in the depositing of sediments and nutrients and other materials stemming from steeper areas, the infiltration of water in the soil, and the minimization of surface runoff and erosive processes, among other aspects (BINFORD; BUCHENAU, 1993). The vegetation cover enhances surface stability, creating and maintaining the structure of the superficial layer of the soil. It regulates the physical-climatic system, the bio-geochemical cycles, and the (surface and subsurface) hydrodynamic processes. Its main role is to foster a reduction in the impact of raindrops on the

soil surface by providing an arboreal stratum and a layer of natural litter on the ground; the associated friction reduces the flow energy of surface runoff (CANIL, 2006).

Thus, the riparian vegetation functions as a buffer system that minimizes potential impacts associated to the transition from the terrestrial system to the aquatic one such as the transportation of sediments and nutrients from the soil of adjacent areas which could lead to excesses of organic material in the water bodies and consequent eutrophication and/or silting up, causing the death of the aquatic community (LOWRENCE et al., 1997; PADILHA, 2009).

Currently Federal Law 12.651/2012 (BRASIL, 2012) provides for the protection of those areas ensuring the presence of vegetation along the banks of rivers according to the width of the riverbed and the minimum permissible width of the vegetation strip is 30 meters. It should be noted that the protection of such areas has been foreseen in the legislation ever since the 1960s under the aegis of the Brazilian Forest Law – Federal Law 4.771 of 1964.

However, in the urban milieu those areas have become highly densified as can be seen in the city of São Paulo, where, according to Gouveia (2016) between 1926 and 1930 the implantation of the 'Avenues Plan' proposed by engineer Prestes Maia took place to serve the interests of the real estate and automobile sectors. The valley bottoms were occupied by long avenues inserted either in the wider part of the river bed or over the river after it had been straightened and canalized and the peripheral areas were the site of irregular occupations where *"clandestineness became transformed into 'extra-legality' [...] in order to be recognized and thus acquire the necessary legal status to be considered by the public services (GOUVEIA, 2016, s/p)"* and so it has remained up until today. ,

In the face of that scenario, the linear parks emerge as the most efficient alternative for administering the valley bottom areas in that they perform a sanitizing function, increase the permeability of the basin and propitiate spaces for leisure and recreation.

## **5. FINAL CONSIDERATIONS**

Urban parks are responses to human necessities and they reflect the historical moment being experienced. They constitute the most efficient appropriation of urban space in areas with fragile relief, configuring a fundamental and indispensable instrument of urban administration.

As has been shown, the very first parks appropriated areas in disuse, vacant spaces in the urban fabric. Nowadays the parks appropriate stagnant areas of the urban landscape such as areas with fragile relief (steep slopes and valley bottoms) and degraded areas. In the past the parks emerged to improve the population's quality of life in the post-industrialization period; today the park endeavors to strike a balance between built space and natural space.

By tracing the historical evolution and construction of the present-day scenario, it is possible to infer that future generations of urban parks will tend to be constituted of elements that represent the natural landscape either by preserving existing natural areas or by rehabilitating and recuperating degraded areas, in addition to providing leisure and recreation activities.

Currently the most proposed typology for parks is the linear park. It is a model that offers a solution to land use problems in urban areas such as flooding, irregular forms of land

occupation, and a lack of areas for recreation and leisure. Against that background, the linear park performs as a sanitizing park insofar as it does not adhere to ecological principals.

The development of linear parks emerges as a response to the observable damage associated to our adaptation of the natural environment to the built environment. That particular typology represents the main form of protection of the environmental systems and of the inclusion of society.

It is believed that in future scenarios, to contain problems of an environmental order, the urban water network will be occupied by linear parks forming corridors of connection within the city.

Research must be carried out to identify the efficiency of those linear parks that already exist in Brazil with the intention of subsidizing the planning of new areas.

It should be underscored that due to the social and economic problems that Brazil is experiencing, if the banks of the water courses were to have their function restricted to the ecological ones alone (Areas of Permanent Protection, in the terms of the extant legislation) there will be a strong tendency for them to be occupied irregularly and, given that context, a new use for them is needed that integrates the population.

Lastly, it must be observed that even though they have been reinvented over the centuries, the parks still hold firm to their original premises, namely, the contemplation of nature and bringing together the social actors.

## REFERENCES

- AHERN, J. Greenways as a planning strategy. **Landscape and Urban Planning**. v. 33, p. 131-155, 1995. doi: [https://doi.org/10.1016/0169-2046\(95\)02039-V](https://doi.org/10.1016/0169-2046(95)02039-V)
- AHERN, J. F. **Greenways as strategic landscape planning: theory and application**. Wageningen-Holanda, PhD Thesis - Wageningen University, 2002. Available at: <<https://library.wur.nl/WebQuery/wurpubs/fulltext/163021>>
- ARAÚJO, C. N. **Parques urbanos de Curitiba: 1980-2000**. Curitiba: Solar do Rosário, 2007.
- BAHLS, A. V. S. **O verde na Metrópole: a evolução das praças e jardins de Curitiba (1885-1976)**. Curitiba, Dissertation (MSc in History) – UFPR, 1998.
- BARBOSA, R. V. R. **Áreas verdes e qualidade térmica em ambientes urbanos: estudos em microclimas de Maceió (AL)**. São Carlos, Dissertation (MSc in Environmental Engineering. – EESC/USP, 2005.
- BERNATZKY, A. **Tree Ecology and Preservation -Developments in Agricultural and Managed-Forest Ecology**. Amsterdam: Elsevier, 1978.
- BINFORD, M.W.; BUCHENAU, M.J. Riparian greenways and water resources. *In*: SMITH, D.S.; HELLMUND, P. C. (Eds.). **Ecology of greenways: design and function of linear conservation areas**. Minneapolis: University of Minnesota Press, 1993.
- BITAR, O. Y. **Avaliação da recuperação de áreas degradadas por mineração na Região Metropolitana de São Paulo**. São Paulo, Thesis (PhD in Mineral Engineering) –Escola Politécnica/Universidade de São Paulo, 1997.
- BONDUKI, N.; FERREIRA, J. S. W. (Coord.). **Pesquisa e Análise de Aplicação de Instrumentos em Planejamento Urbano Ambiental no Município de São Paulo**. Relatório II – Sistematização bibliográfica sobre planejamento urbano-ambiental e zoneamento ambiental. São Paulo: LabHab FAU/USP, 2006. Available at: <[http://www.fau.usp.br/depprojeto/labhab/biblioteca/produtos/pesquisa\\_analise\\_sistematiza-biblio.pdf](http://www.fau.usp.br/depprojeto/labhab/biblioteca/produtos/pesquisa_analise_sistematiza-biblio.pdf)>

- BRASIL. Lei nº 12.651, de 25 de dezembro de 2012. Dispõe sobre a proteção da vegetação nativa. Brasília: **Diário Oficial da União**, 2012.
- CANIL, K. **Indicadores para o monitoramento de processos morfodinâmicos: aplicação na bacia do Ribeirão de Pirajussara (SP)**. São Paulo, Tese (Doutorado em Geografia Física) – FFLCH/USP, 2006.
- CASTELNOU NETO, A. M. N. **Ecotopias Urbanas: imagem e consumo dos parques curitibanos**. Curitiba, Thesis (PhD in Environment and Development) – UFPR, 2005.
- CHEUNG, P.K.; JIM C. Y.; SIU, C. T. Effects of urban park design features on summer air temperature and humidity in compact-city milieu. **Applied Geography**. 129, 2021. doi: <https://doi.org/10.1016/j.apgeog.2021.102439>
- CHIESURA, A. The role of urban parks for the sustainable city. **Landscape and Urban Planning**, 68(1), 129-138, 2004. doi: <https://doi.org/10.1016/j.landurbplan.2003.08.003>
- COSTA, D. O. **Parâmetros normativos para a gestão de parques urbanos do Distrito Federal**. Brasília, Dissertation (MSc in Geography) – UnB, 2011.
- CUNHA, A. G. da. **Dicionário etimológico da língua portuguesa**. Rio de Janeiro: Lexikon editora, 2010.
- CUSTÓDIO, R. B. **As influências das intervenções urbanísticas na atividade turística da cidade de Curitiba**. Curitiba, Dissertation (MSc in Urban Administration) – PUC-PR, 2006.
- FRANCO, M. A. R. **Desenho Ambiental: uma introdução à arquitetura da paisagem com o paradigma ecológico**. São Paulo: Annablume/Fapesp, 2008.
- FRISCHENBRUDER, M. T. M.; PELLEGRINO, P. Using greenways to reclaim nature in Brazilian cities. **Landscape and Urban Planning**, 76, 67-78, 2006. doi: <https://doi.org/10.1016/j.landurbplan.2004.09.043>
- GOUVEIA, I. C. M. C. A cidade de São Paulo e seus rios: uma história repleta de paradoxos. **Confins**, 27, 2016. doi: <https://doi.org/10.4000/confins.10884>
- HOWARD, E. **Cidades-Jardins de Amanhã**. São Paulo: Hucitec, 1996.
- IPPUC (Instituto de Pesquisa e Planejamento Urbano de Curitiba). **História do planejamento**. Available at: <http://www.ippuc.org.br/ippucweb/sasi/home/> Consulted in: Dec. 2011.
- JEON, J. Y.; HONG, J.Y. Classification of urban park soundscapes through perceptions of the acoustical environments. **Landscape and Urban Planning**, 141, 100-111, 2015. doi: <https://doi.org/10.1016/j.landurbplan.2015.05.005>
- KLIASS, R. G. **Parques Urbanos de São Paulo e sua evolução na cidade**. São Paulo: Pini, 1993.
- KLIASS, R. G.; MAGNOLI, M.M. Áreas verdes de recreação. **Paisagem Ambiente: ensaios**, São Paulo, 21, 245-256, 2006.
- LOWRENCE, R. *et al.* Water quality functions of riparian forest buffers in Chesapeake Bay watersheds. **Environmental Management**, New York, 21(5), 687-712, 1997.
- MAGNOLI, M. M. O parque no desenho urbano. **Paisagem e Ambiente: ensaios**, São Paulo, 21, 199-214, 2006.
- MANTOVANI, W. A diversidade biológica em parques urbanos. In: Glezer, R.; Mantovani, M. S. M (Orgs.). **Parques urbanos e meio ambiente: desafios e usos**. São Paulo: Parque Cientec/USP, 2005, p. 125-162.
- MARCONI, M. A.; LAKATOS, E. M. **Fundamentos de metodologia científica**. Atualizado por MEDEIROS, J. B. São Paulo: Atlas, 9ed., 2021a.
- MARCONI, M. A.; LAKATOS, E. M. **Metodologia do trabalho científico: projetos de pesquisa, pesquisa bibliográfica, teses de doutorado, dissertações de mestrado, trabalhos de conclusão de curso**. Atualizado por MEDEIROS, J. B. São Paulo: Atlas, 9ed., 2021b.



MARTINS, L. F. V. **Monitoramento de parques urbanos em fundos de vale: análise das funções de conservação e uso público - estudos de casos múltiplos em Curitiba, Paraná.** São Paulo, Tese (Doutorado em Geografia Física) – FFLCH/USP, 2014.

MASCARÓ, L. R.; MASCARÓ, J. L. **Vegetação Urbana.** Porto Alegre: UFRGS, 2002.

MAYMONE, M. A. de A. **Parques urbanos - origens, conceitos, projetos, legislação e custos de implantação estudo de caso: parque das nações indígenas de Campo Grande, MS.** Campo Grande, Dissertation (MSc in Environmental Technology) - UFMS, 2009.

NUNES JÚNIOR, P. C. O Parque do Ibirapuera e o lazer na cidade de São Paulo: da descrição à apropriação. **Revista Rua**, Campinas, 17(2), 145-160, 2011. doi: <https://doi.org/10.20396/rua.v17i2.8638733>

OTTONI, D. A. B. Cidade Jardim: formação e percurso de uma ideia. In: HOWARD, E. **Cidades-Jardins de Amanhã.** São Paulo: Hucitec, 1996.

PADILHA, D. C. C. **Estudo de Áreas de Preservação Permanente (APP's) de corpos d'água em zonas urbanas como subsídio à legislação pertinente.** São Carlos, Dissertation (MSc in Urban Engineering) - UFSCar, 2009.

PANZINI, F. **Projetar a Natureza: arquitetura da paisagem e dos jardins desde as origens até a época contemporânea.** Tradução: ANDRADE, L. São Paulo: Editora Senac, 2013.

PIZARRO, E. P.; LINO, S. S. Parque Linear do Sapé: o descompasso entre consciência e ação. **Revista LABVERDE**, São Paulo, 4, 87-106, 2012.

REGO, R. L. **As Cidades Plantadas: os britânicos e a construção da paisagem do norte do Paraná.** Londrina: Humanidades, 2009.

SÃO PAULO (Município). **Secretaria do Verde e Meio Ambiente: Parques.** Available at: <[https://www.prefeitura.sp.gov.br/cidade/secretarias/meio\\_ambiente/parques/index.php?p=292362](https://www.prefeitura.sp.gov.br/cidade/secretarias/meio_ambiente/parques/index.php?p=292362)> Consulted in: Jul. 2020.

SÃO PAULO (Estado). **Infraestrutura e Meio Ambiente: Coordenadoria de Parques e Parcerias.** Available at: <<https://www.infraestruturameioambiente.sp.gov.br/cpp/>> Consulted in: jun. 2021.

SEARNS, R. M. The evolution of greenways as an adaptive urban landscape form, **Landscape and Urban Planning**, 33, 65-80, 1995. doi: [https://doi.org/10.1016/0169-2046\(94\)02014-7](https://doi.org/10.1016/0169-2046(94)02014-7).

SOLECKI, W. D.; WELCH J. M. Urban parks: green spaces or green walls?. **Landscape and Urban Planning**, 32, 93-106, 1995. doi: [https://doi.org/10.1016/0169-2046\(94\)00193-7](https://doi.org/10.1016/0169-2046(94)00193-7)

SORENSEN, M.; *et al.* **Manejo de las áreas verdes urbanas: documento de buenas prácticas.** Washington: ENV, 1998. Available at: <<https://publications.iadb.org/publications/spanish/document/Manejo-de-las-areas-verdes-urbanas.pdf>>

SUZUMURA, G. Y. R. Parque linear do Canivete sob uma perspectiva do desenho ambiental. **Revista LABVERDE**, (4), 108-128, 2012. doi: <https://doi.org/10.11606/issn.2179-2275.v0i4p108-128>

WHATELY, M. et al. (*Orgs.*). **Parques urbanos municipais de São Paulo: subsídios para a gestão.** São Paulo: Instituto Socioambiental, 2008. Available at: <<http://www.bibliotecadigital.abong.org.br/handle/11465/1208>> Consulted in: Jun. 2013.