

University of Tartu
Department of Semiotics

'Phytocitizens'
Plants in Urban Parks and their Meanings

Master's Thesis

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Tartu, Estonia

2018

I have written the Master Thesis myself, independently. All of the other authors' texts, main viewpoints and all data from other resources have been referred to.

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August 21, 2018.

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Introduction

The aim of this work is to investigate how for human, plants in urban parks are meaningful elements of the urban semiotic landscape. The research will show how a multi-faceted insight into these meanings leads to the definition of a new designation for plants in urban parks.

The epithet highlights the vital role that certain plants assume for humans and formulates the status of these plants as inhabitants of cities.

The work develops a semiotic study of plants in urban parks as physical components of park space, as living signs in a park which have a positive impact on the city's ecology, and as multimodally perceptible objects having socio-cultural meanings for humans.

Some previous works have explored diverse approaches on the meanings and roles of urban parks as places. In the early 80s, the possibility of combining social and aesthetic perspectives towards the study of urban parks had been proposed and discussed by Rosenzweig in his review (Rosenzweig 1984) of works of Frederick Law Olmsted and others. In this work, he has urged that urban parks be examined as both social forces and intellectual-artistic creations. More recently, Low *et al* (2005) have researched the impact of social history, accessibility, inclusiveness, and other aspects in promoting, maintaining, and managing cultural diversity (of human visitors) in urban parks. Jones (2018) studies the park as a liminal space being a fertile ground for cross-disciplinary study and considers how parks relate to recreation, industrial modernity and public health in the urban context.

The emphasis of this work being plants situated in urban parks, the term urban park, throughout the thesis, implies a park, irrespective of size or operating agencies, that is located within the municipal limits of the city. Only those parks which are important for cities primarily as green patches or expanses functioning as a green landscape that is juxtaposed to the space of the rest of the city will be studied. The 'city' that is referred to in this work is necessarily a pre-established city which has stable or expanding human communities.

For the purpose of this study, the term 'plants', unless otherwise specified, implies macroscopic vascular plants which form the green components in the design of the park. However, where required, the discussion does not exclude spontaneous plant growths which are not undesirable in any way, which may or may not be in any mutual relationship with the intentional plantings or those which have not been actively planted but are not removed.

Plants are different from other components of an urban park in that they are living signs which are inherently not dependent on humans for their growth and survival. Humans, however are biologically dependent on plants for survival and subsistence. Moreover, it is impossible to find any human habitat that is entirely devoid of any plant species. It is also a fact that plants have always been prominent in human culture as artefacts, motifs, as symbolic representations, or entities with symbolic social meanings. Therefore, to analyse such manifold meanings that plants in urban parks have and can have for humans, I will use 3 different frames of analysis, which are 3 different viewpoints to semiotize plants in the urban park. A separate chapter will be dedicated to each frame:

In Frame 1, Biosphere, the biological meaning of plants for humans is revisited as the fundament of the human-plant relationship, while the themes of conservation and mutualism provide the context for the discussion of urban parks as venues promoting biodiversity and ecological benefits for cities and citizens.

Frame 2, Spatiality, includes approaches which consider the space of and in the urban park as an areal-spatial unit, citing two of the ways in this unit may get incorporated into the city space. Semiotic Considerations is the third frame of analysis which applies semiotic concepts to observe the meanings of the urban park. The initial subchapter on multimodal perceptions of parks highlights the park environment as an important semiotic environment having the potential of being designed especially for differently abled humans.

Humans have already had a very long history of urbanization. Beginning from building the oldest and massive, highly developed cluster cities of the Mohenjo-Daro and Harappa civilizations, we have reached a time where massive new cities, which are the 21st century versions of these ancient urban systems, are being created as economic centres across all continents. If trade and agriculture led to the establishment of the earliest cities, economy is what has been driving the further development and continual expansion of urban landscapes.

Where humans break ground to build a city, nonhuman species inevitably lose their habitats. Cities, primarily, are created for humans by humans, with the purpose of accommodating them physically and making available a location for semiotic activities like economy, society and culture to occur and evolve. However, being spatially defined and demarcated does not render cities as isolated systems. They are open dynamical systems; hence the occupation of cities can never be limited to the occupation by only humans. Cities have been and will always be spaces occupied by multiple species, among which are plants that thrive in the urban space with or

without human agency or intervention. Thus, plants that are present in a city by design are the planned greens including those located in the urban parks, avenue trees, private and public gardens, on rooftop terraces, window boxes, balconies, and indoor spaces. Depending on the space in which they are being grown, these plants fulfil various functions or bestow the spaces with a range of meanings. For instance, while the plants in a kitchen garden serve as a ready source of fresh herbs, those placed in a library help break the repetitive geometry of the interior, and function as aesthetic visual relief.

The urban park is a more comprehensive mixture of plants which have multipurpose functions. For a park, species are selected based on various criteria in response to its purpose, requirements of the design, and depending on the talent and decisions of its designers. The criteria are related to the characteristics of the plants are shape, forms, textures, colours, seasonality, phenology, growth period, size and form attained after full growth, life span, popularity, safety, foliage shedding, etc. Further, certain species are preferred based on practicalities like the degree of maintenance required in terms of watering and pruning, adaptability to soil and moisture conditions, and their susceptibility to climatic conditions, diseases, and overall tolerance to the urban environment.

Urban parks are not forests; they are areas which undergo varying degrees of maintenance so as to allow visitors access to open, green public spaces within the city. The value that plants add to the park can be defined on the basis of their role in the design of the park, and their ecological and cultural value. The frames of analysis also highlight these aspects.

Plants in urban parks are those sessile, nonmigrating living-metabolizing entities that are necessarily protected and maintained regularly in designed outdoor public spaces within city limits. Urban parks, as cultural landscapes (Sauer 1996 [1925]), are where humans ensure that plants thrive in the same space over long periods of time. While this allows plants to be preserved and conserved, it also results in urban parks making a positive impact on the city. Plants in urban parks and humans are thus not only biological, but also socio-cultural symbionts in the urban context.

This leads to the understanding that like human citizens who contribute to and benefit from all urban systems, plants in urban parks are also essentially are in the same relationship to the city, contributing towards improving the quality of city life, while themselves surviving in the urban space. On the basis of this understanding, I have coined a neologism to designate plants of urban parks — **‘Phytocitizens’**.

Introducing Phytocitizens

The prefix of this term, ‘phyto-’, originates from *phutón*, the word for ‘plant’ in ancient Greek¹ and is intended to convey this same meaning in the coinage. The prefix ‘phyto-’ in new this term is used in the same sense as in the term ‘phytocoenosis’².

Citizens are legally recognised members with associated rights and obligations. This sense is included in ‘phytocitizens’, and the idea is also consistent with meanings like denizen, inhabitant, and resident.

‘Phytocitizens’ is a designation for particularly those plants and plant species in urban parks which have high ecological and cultural value; in other words, it will make it possible to classify and refer to certain plants as phytocitizens based on their biological, cultural and social significance and value that they have acquired over time due to various factors. The chapter in this work entitled “‘Phytocitizens’ – A New Designation” discusses reasons why this epithet is applicable to plants and which attributes of plants contribute towards their status as phytocitizens. Using this term for the plants will serve the purpose of bringing important individuals and species with the title of ‘phytocitizens’ more prominently into the discourses of general society, politics and green activism. As mentioned before, urban parks are where plants have a better chance of being protected in the city, as against those in a forest or the side of the street. This translates into their having a better chance of surviving and being inhabitants of the city for a longer time than other plants which are outside the park.

Being rooted in a semiotic approach, this coinage can find applications across discourses and will prove to be a useful symbolic term in all contemporary and futuristic disciplines dealing with the role of plants as significant in efforts towards conservation of nonhuman nature on the planet. The frames of analysis, namely, Biosphere, Spatiality and Semiotic Considerations will serve to define this new designation for plants in urban parks as ‘phytocitizens’ by elaborating on how plants affect the space of a city for humans and lead to ecological, sociocultural and thus ultimately semiotic enrichment of urban systems. The designation would be prominent in activities like tree census, environmental impact assessment, and biodiversity research.

¹ ‘phyto-’

From Ancient Greek φυτόν (*phutón*, “plant”). Source: <https://en.wiktionary.org/wiki/phyto->

² ‘phytocoenoses’

A living collection of plant life forms that are found together, interacting as a community within an ecosystem. From phyto- + coenosis. Source: <https://en.wiktionary.org/wiki/phytocoenosis#English>

1. Frame 1 – Biosphere

Photoautotrophs first appeared on the planet approximately 1 billion years ago (Strother *et al* 2011) and *Homo sapiens* evolved long after, approximately 300,000 years ago. Being obligate aerobes, humans therefore will always entirely rely on plants (Krampen 2001:421) as their sources of free oxygen until they can invent or discover alternatives to generate oxygen for all humankind on a mass-scale. Approximately 70% of the free oxygen available to humans is generated by marine phytoplankton (Yadigar, Sergei 2015:2325).

If humans are dependent on the microscopic oceanic diatoms as the major source of oxygen, terrestrial plants, which are producers of the food web, are what they directly or indirectly depend on and interact with as consumers in the nutrition cycle (Gough 2011) and as organisms which have the capacity for niche construction (Laland *et al* 2000).

Humans are a species that has evolved because of its capacity to modify nature to various degrees; one of the results of this is the origin and development of cities and another is their utilization of nonhuman nature. Culture and lifestyle have always influenced how land and plants resources get utilized by humans.

From the point of view of urban ecology, humans are a hyperdense species. Nevertheless, even such a populous environment as a city, human–Nature is not a dichotomy. The city then is an overlapping collage, in 3-dimensional space, of territories of multiple species. Further, among all other species of animals, evolutionary history of the human form has also led to the material and biological existence of humans is based on a ‘body plan’³, enabling them to become what they are and do what they do – the very fact that humans are able to perceive plants means that they ‘need’ to perceive plants as impingements⁴, resources to rely on for fulfilment of needs, and organisms to form symbiotic relationships with. This underscores the importance of preserving them within the space of the urban park. Urban parks can therefore be considered as a concentration of ecological relations, having its own plants communities, leading to the formation of urban biomes and ultimately, an urban micro biosphere.

In this first frame, the study puts an emphasis on the ecological importance of plants, and ecological role played by them within this context. The fact that we are biologically dependent on plants in numerous ways is indeed a driving force for stressing upon the necessity of the

³ ‘Body plan’. Available at: https://en.wikipedia.org/wiki/Body_plan#Origin

⁴ See (Hoffmeyer 2008:169) for the introductory section of ‘Zoosemiotics’ mentioning the ability of the cephalopod brain to see what it ‘needs to see’.

availability and abundance of urban parks. However, our very existence on the planet has for long been bringing about some extreme disturbances in biogeochemical cycles, and the prognosis that we might already be exceeding the capacity of our natural environment to sustain us, are two factors which also become very important in arguing for the maintenance of green spaces within city limits. It is especially critical for cities to protect and preserve their greens because cities are in fact not isolated from any other ecosystem: any disturbances or changes to the environment which bring about adverse effects in their wake, also affect the conditions in the city, and the positive and restorative ecological impact that the plants in the city can have does not remain limited only to the space of the city. Moreover, cities are inhabited not by humans alone and need urban parks for the ecological benefits that they bestow upon all those non-human species which also inhabit urban spaces, and particularly the parks. It is over longer time durations that animals like insects, amphibians, reptiles, rodents and herbivores can establish mutual relationships with the vegetation and complete their life cycles without being displaced or forced to migrate. Thus parks, in addition to preserving plant diversity, also support animal diversity by attracting and sustaining multiple species at the same time. This adds to overall biodiversity in the city. Ever-increasingly, anthropogenic activities in urban and suburban areas and the establishment of new human habitats by appropriation of green spaces causes disturbances in the habitats of nonhuman animals. Owing to the presence of plants, urban parks have the potential to counter the effects of such habitat loss and offer these animals sanctuary for shelter, feeding, and nesting.

While the ground in the rest of the city may largely be covered by concrete, tar or other manmade materials, parks have soil beds as a necessary element of their design; this in turn may lead to the conservation of communities of soil microbes and their diversity, depending on the species chosen as plantings, and how well the soil is managed.

Plant communities in urban parks have the capacity to not only affect the biotic factors but also local abiotic factors like air temperature, air quality, as also ground water reserves in and around parks. The presence of populations of large trees have also been proven to reduce sound pollution and can act as buffer zones to reduce urban noise (see González-Oreja *et al* 2010, Cohen *et al* 2014).

There have been numerous studies which assess the cooling effects of urban greens on average temperatures, among which there are empirical studies which employed geospatial techniques to prove that green parks have the capacity to combat the heat island effect (Chibuike *et al* 2018) which occurs in cities due to a disproportionate presence of non-organic artificial

materials of built structures, vehicular use and mobility infrastructure. Results of field observations of the thermal performance of parks have also proven that urban environments adjacent to the parks also received a cooling effect due to proximity to park (Yan *et al* 2018). Study of the thermal profile of parks themselves, in different seasons, reveals that areas under green cover show markedly lower temperature in comparison to surrounding semi-arid areas (Dronova *et al* 2018).

A year 2010 research by the National Recreation and Park Association on the effects of trees and urban parks in the USA concluded that park trees can produce significant air quality effects at and around their locations by various mechanisms which are rooted in their metabolic functions⁵:

A. Air pollution reduction – Annual removal of pollution from emissions by urban park trees across the USA was 75 thousand tons, averaging up to 80 pounds of pollution removal per acre of tree cover.

B. Ultraviolet radiation reduction – Tree leaves absorb 95% of incident ultraviolet radiation, protecting the visitor from the main factor causing skin cancer and cataracts. It has been mentioned that trees in urban parks can prevent these ailments and in turn also save the country total direct costs incurred by treatments required for them.

C. Carbon dioxide Reduction – In addition to absorption of heat, trees and other plants in urban parks help remove carbon dioxide by utilising the gas directly from the air during photosynthesis. The statistics from the results of this research show that in the USA, the annual removal of carbon dioxide and storage of carbon in urban park trees and soils was 75 million tons and 102 million tons respectively. Carbon storage per acre of tree cover was 40 tons, while per acre of soil stored 32 tons.

The research concludes with goals and recommendations for park management in the USA. The ones most salient and relevant to this work are: (i) urban park design should vary the vegetation profile and land cover for optimum comfort to the visitors, (ii) to sustain large, healthy trees since they have the greatest per tree effect on removal of carbon and polluting emissions, (iii) to use long lived, low maintenance and evergreen trees.

Plants in urban parks thus play a major role to play in aiding efforts aimed at rectifying the damage humans are causing to the biosphere. Humans need to recognize the space of urban

⁵ For the executive summary of the results of this research, see Nowak, David J.; Heisler, Gordon M. 2010. Air Quality Effects of Urban Trees and Parks. In: *Research Series 2010*. Available at: https://www.nrpa.org/uploadedFiles/nrpa.org/Publications_and_Research/Research/Papers/Nowak-Heisler-Summary.pdf

parks, and especially the plants in it, as a support system to counter the effects of many of the activities which have led to environmental degradation. This aspect reinforces the status of plants in urban parks as phytocitizens, lending humans a new perspective to regard their value and role as central in mitigating the adverse effects anthropogenic activities continuously in the present time and cumulatively over the coming years.

1.1 E. O. Wilson's 'biophilia' hypothesis: why we like urban parks

Our urge to have contact with nature wherever we are and to surround ourselves with plants finds explanation in E. O. Wilson's concept of biophilia (Wilson 2003 [1984]), in which he states that we have an innate tendency to focus on life and life-like processes and to be in natural settings. An aspect of the biophilia hypothesis further elaborates that unthreatening natural landscapes elicit positive responses in humans; the reasons for this being that for early humans, the sight of lush landscapes indicated the availability of necessities viz water and food. Therefore, affiliating with natural settings was critical for survival-related advantages. Our primary and most primitive response to a natural landscape is hence that of 'liking' and 'approaching' it. It has also been predicted that green vegetation perhaps attracts more attention than those colours and forms which remind us of arid and scant desert-like environments (Ulrich 1993). Ulrich further elaborates that several studies have found that adult groups across 3 different ethnicities responded with high liking to simulations (colour slides) of parklike (or savanna-like) natural environments. Even in international studies which focused on preference responses to forest landscapes, the results have clearly indicated that the participants like variations (in the forest settings) which resemble parklike settings having attributes like visual openness, uniform ground cover, mature trees having large diameter and downed wood (which can invoke feelings that one is looking at raw wilderness). Studies have shown that from a functional-evolutionary perspective, biophilic responses to being physically present in parklike environments undoubtedly have restorative functions. In early humans, being in a savanna had the advantages of a) the possibility to recharge physical energy, b) stress alleviation following a dangerous encounter, and c) rapid reduction of aggression following intraspecies antagonism. The perils that early humans encountered are comparable to the pressures inflicted by an urban life on today's humans; the benefits of visiting a park trigger the adaptive responses to parklike natural settings that humans have imbibed during the course of evolution. If the city life is tiring, our response to being in parks promotes recovery from fatigue; if the urban lifestyle is

demanding, its detrimental effects are countered by spending time in a park which allows one to regain the capacity to respond effectively to a demanding situation which may occur later. Going to a park can also be seen as an adaptive mobilization to physically get away from stress bringing about a shift toward a more positively toned emotional state.

Urban parks are thus meaningful for us as biological beings, allowing us to be in a space that we have learned to perceive as restorative and ultimately promoting a sense of well-being. This then becomes our incentive to preserve urban parks which subsequently leads to the preservation of plant (and animal) life present there.

The biophilia hypothesis reinforces the potential of the designation ‘phytocitizens’ for plants in urban parks gaining acceptance in the public discourse. Although biophilia is a strategy that humans evolved for survival, it also predisposes them to empathy⁶ towards biotic components which are perceptibly and evidently beneficial to them. The term ‘phytocitizens’ works towards bringing the status of plants in the urban park at par with a city’s human citizens.

1.2 The Royal Parks of London

A study of the Royal Parks of London proves to be a comprehensive argument elaborating on the status of plants in urban parks as citizens. The spaces that are now called the royal parks were designed as a result of action of human culture and lifestyle on the natural surroundings of that region, originating as such long before the London city of today, as spaces with cultural meanings assigned to them. Therefore, native plants like the ancient oaks that have stood there for centuries⁷ are, by virtue of their age and being sessile, the original inhabitants of the space that developed into present-day London. Park management ensures that they continue to be concentrations of biodiversity despite their proximity to built environments and remain supportive of wildlife while providing humans with easy access to rich green spaces.

The Royal Parks in London have been owned by monarchs since the 15th century (the ownership has been retained within the monarchy even in the present time), which underwent redesigning from being hunting grounds to being formal gardens. Starting from year 1845, they

⁶ See Barbiero, Giuseppe 2013. ‘Biophilia and Gaia: Two Hypotheses for an Affective Ecology’. Available at: <http://www.biourbanism.org/biophilia-and-gaia-two-hypotheses-for-an-affective-ecology/>

⁷ In Richmond Park, which is the largest of London’s 8 royal parks, has around 1400 ancient trees, most of which are oaks up to 800 years old. Source: “Richmond Park National Nature Reserve” video (length: 20.50 mins). Available at: <https://www.youtube.com/watch?v=LMGKSwwqryso>

were gradually converted to their present-day status as a public park network accessible to everyone. This park system which is spread over 5000 acres of land improves the quality of the city space and life, because these green lungs, mainly trees, combat the heat sink effect of the city, while also acting as wind buffers. Their roots take up flood water that has percolated through its soil surfaces and purify the air by absorbing carbon dioxide and pollution.⁸ About 1,70,000 trees, among which about 1500 are veteran trees, form 1100 acres of woodland distributed throughout the park system. There are more than 250 tree species which include native and naturalised species such as oaks, beeches, birches and chestnuts. The value of every tree can be imagined from the fact that a single tree for instance, a mature oak, can support 500 different species of non-plant organisms such as birds, bats, insects, fungi and lichens.⁹

These green spaces are what makes London one of the greenest cities in the world. The royal parks are celebrated for their ecology and biodiversity, while being lauded for other qualities. The Royal Parks Sustainability Strategy for 2015–2025 (The Royal Parks 2016) takes a proactive management approach to sustainability based on the criteria and framework given by the ISO 14001 environmental management system (EMS).

One of their key aims is to conserve and enhance biodiversity in the parks. This is being achieved by monitoring and researching ecosystems, wildlife and species in the park areas. Methodology includes, but is not limited to, surveying vegetation according to the National Vegetation Classification (NVC) and the Saproxyllic invertebrate survey (The Royal Parks 2016: 23) which will help establish what assemblages of ‘deadwood’ invertebrates the Royal Parks have in veteran trees. As a biodiversity measure, the Pollinator Strategy (Watts 2015)¹⁰ is exercised by planting of wild meadow turfs to attract pollinators.

The unique green heritage landscapes also have high value as urban green infrastructure. This supports another key aim of the strategy, that of mitigating and adapting to climate change. The parks have already been contributing to this by providing carbon capture, particulate absorption and emissions sequestration for the parks and areas surrounding them, as well as regulating temperatures in summer. This has earned the Parks the monikers “London’s Lungs” and “London’s Thermostat”.

⁸ See the official website of the management of The Royal Parks London. Available at: <https://www.royalparks.org.uk/media-centre/factsheets-on-the-royal-parks/general-facts>

⁹ Details available at <https://www.royalparks.org.uk/media-centre/factsheets-on-the-royal-parks/trees>

¹⁰ Watts, Claudia 2015. “The Royal Parks Pollinator Strategy”. Available at: <https://www.royalparks.org.uk/managing-the-parks/park-strategies/the-royal-parks-pollinator-strategy> OR https://www.royalparks.org.uk/__data/assets/pdf_file/0006/60783/The-Royal-Parks-Pollinator-Strategy.pdf

So that the parks may continue being centres reducing greenhouse gas emissions, trees must be protected. In order to achieve this, trees are monitored using assessment systems such as I-trees and Arbortrack which can quantify the environmental, social and economic value of the trees and to help assess decline and improvement in the health of the trees. Further, the ‘Trees Planting Strategies’ involve identification of those tree species which are resistant to water and temperature changes and therefore adapt to climate change better than other species. For this purpose, the environment for the trees themselves needs to be maintained with optimal conditions. The methods for this are: 1. Better protection for tree rooting environments e.g. during events and in heavy footfall areas, 2. Soil mitigation e.g. changed leaf collection practices, more mulching around the bases of trees and 3. Changes to mowing regimes, e.g. increase of halo mowing and meadow management for grassland.

In response to their Sustainability Strategy, a number of management activities were accomplished in all 8 parks. They are enlisted in the 2016–17 Annual Report of the Royal Parks¹¹. Those involving plants and trees are as described below (Table 1):

Location (Name of Park)	Management Activity to support sustainability strategy
The Green Park	‘The Queen’s Meadow’ established to help reverse the decline of wildflower meadows in the country.
St James’s Park	800 metres of wildflower turf planted to encourage pollinators. Plant species chosen: meadow cranesbill, red campion, oxeye daisy, field scabious, meadow buttercup and musk mallow.
Hyde Park	3 new meadow beds created in support of Pollinator Strategy (a method of Sustainable Strategy). Gorse planting and native hedgerow planting undertaken to add to biodiversity.
Brompton Cemetery*¹²	12000 wildflowers planted. Yellow rattle, a hemi-parasite of grasses, sown in 8 areas to control coarse grasses and helping more diverse flora to establish in the planted areas.
Richmond Park	Wildflower seeds planted. Hedgerow sown with native nectar and berry plants to attract pollinators. A program initiated to install permanent fencing around vulnerable ancient and veteran trees. This is to reduce soil compaction and enable pruning techniques which can prolong the life of these internationally important tree specimens.

¹¹ Source: ‘The Royal Parks Annual Reports and Account 2016–17’ available at: <https://www.royalparks.org.uk/about-us/publications> OR https://www.royalparks.org.uk/__data/assets/pdf_file/0020/83027/Annual-Report-and-Accounts-2016-17.pdf

¹² *Note: Brompton Cemetery, which is a site of Nature Conservation, is managed together with the 8 Royal Parks, along with Victoria Tower Gardens.

	Pollarding of selected young trees which on growing old will become vast and hollow. This ensures that the specialist habitat that these trees provide is maintained; this also sustains biodiversity in the long run.
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Table 1: Plant-related management activities in some of the Royal Parks to support their sustainability strategy. Please see footnote 3.

The annual report also mentions pest control measures and invasive plant species control: Oak trees in all the parks have been invaded by the Oak Processionary Moth. This was managed by selective pesticide spraying and then removal of the moth nests. *Rhododendron ponticum*, an invasive species, has to be eliminated from the space of Bushy Park by careful removal. The persistent removal of this plant from Richmond Park over a period of 6 years has benefited wildlife such as nesting hobbies and buzzards.¹³

From the study of the case of London’s Royal Parks, it emerges that plants here are managed to a great degree so that these green spaces remain consistent with the intended design and planning and continue to attract visitors while also increasingly enhancing their value as hotspots of ecological preservation. It is deducible that green spaces as London’s 8 interconnected parks are inherently more reliable for the role they play in preserving biodiversity and the quality of the city environment. This is also evident in the stance taken by the management of the park system, which meticulously monitors the conditions of the park based on the health of the plants themselves.

While requiring economic investment, infrastructure and management, in other words, requiring human capital, the royal parks are cultural spaces which are preserves of natural capital. Among these are the ancient plants which contribute to the human efforts aimed at creating a significant positive impact for the local ecosystem.

1.3 Piet Oudolf’s approach to park design

Human culture drives the choice of plants not only as natural resources to fulfil their needs, but also as physical forms and objects to decorate surroundings and for cultural activities. For example, plants have been used for their aesthetic presence as far back as 26th century BC – a

¹³ Source: ‘The Royal Parks Annual Reports and Account 2016–17’ available at: <https://www.royalparks.org.uk/about-us/publications> OR https://www.royalparks.org.uk/__data/assets/pdf_file/0020/83027/Annual-Report-and-Accounts-2016-17.pdf

peek into the history of the art of arranging flowers reveals that circa 2500 BC, floral bouquets were a popular activity in Egypt and formal bouquets were offered in large numbers to Egyptian temple deities (Buchmann 2015).

While structures of cities evolve over time on the basis of changes in the architectural landscape, the landscape of urban parks evolves following changes occurring in forms of plants during one entire cycle of seasons and over their entire life cycle. It is common practice in park design to vary plantings round the year by selection of annual or biennial herbs, so that blooms may attract human and nonhuman animal visitors alike in the flowering season. While the blossoms of annuals and biennials will provide the park its aesthetic highlights at certain times of the year, for the rest of the year, their vegetative habits may lose appeal and may not be perceived as attractive forms by the park visitor.

It is this gap in the choice of plantings for park design that has been exploited by Dutch landscape architect and garden designer Piet Oudolf. The idea of selecting plants for the all-year-round aesthetic value of their forms is the mainstay of his work. His main criterion in the selection of plants is that they should be perennials which have interesting colors, forms and textures in their vegetative habit, so their appealing qualities are not dependent merely on their blossoms.

Thus, the plantings are chosen for their structural characteristics which remain in place even after the flowering season of the plant has passed. By selecting perennials, his designs also ensure that the plantings are physical features that do not have to be removed and over time serve to stabilize the design by being permanent structural components. In his work (with other designers) for Lurie Gardens at Millennium Park in Chicago, the “Shoulder Hedge”¹⁴ has been planted with the following perennials (Table 3)¹⁵:

Common Name	<i>Botanical Name</i>
Hornbeam	<i>Carpinus betulus</i> ‘Fastigiata’
European Beech	<i>Fagus sylvatica</i>
Arborvitae/Thuja	<i>Thuja occidentalis</i> ‘Nigra’
	<i>Thuja occidentalis</i> ‘Wintergreen’
	<i>Thuja occidentalis</i> ‘Pyramidalis’

¹⁴ Garden Features of Lurie Garden, Millennium Park (includes details about the Shoulder Hedge). Available at: <https://www.lurigarden.org/about/garden-features/>

¹⁵ Source: The Lurie Garden Plant List 2009. Available at: greenmarkpr.com/wp-content/uploads/2009/03/tlg-plant-list-final.doc

	<i>Thuja occidentalis</i> ‘Brabant’
	<i>Thuja standishii x plicata</i> ‘Spring Grove’

Table 3: Perennials planted in the ‘Shoulder Hedge’ of Lurie Garden, Millennium Park, Chicago.

The choice of species is such that as the plants grow larger and taller, they will fill up the space within the 14 feet high armature of the hedge. While hornbeam and European beech can reach heights of at least 49 feet, the cultivars of Arborvitae (or Thuja) that have been chosen (‘Nigra’, ‘Wintergreen’, ‘Pyramidalis’, ‘Brabant’, ‘Spring Grove’) all attain a height of at least 15 feet on maturing.¹⁶

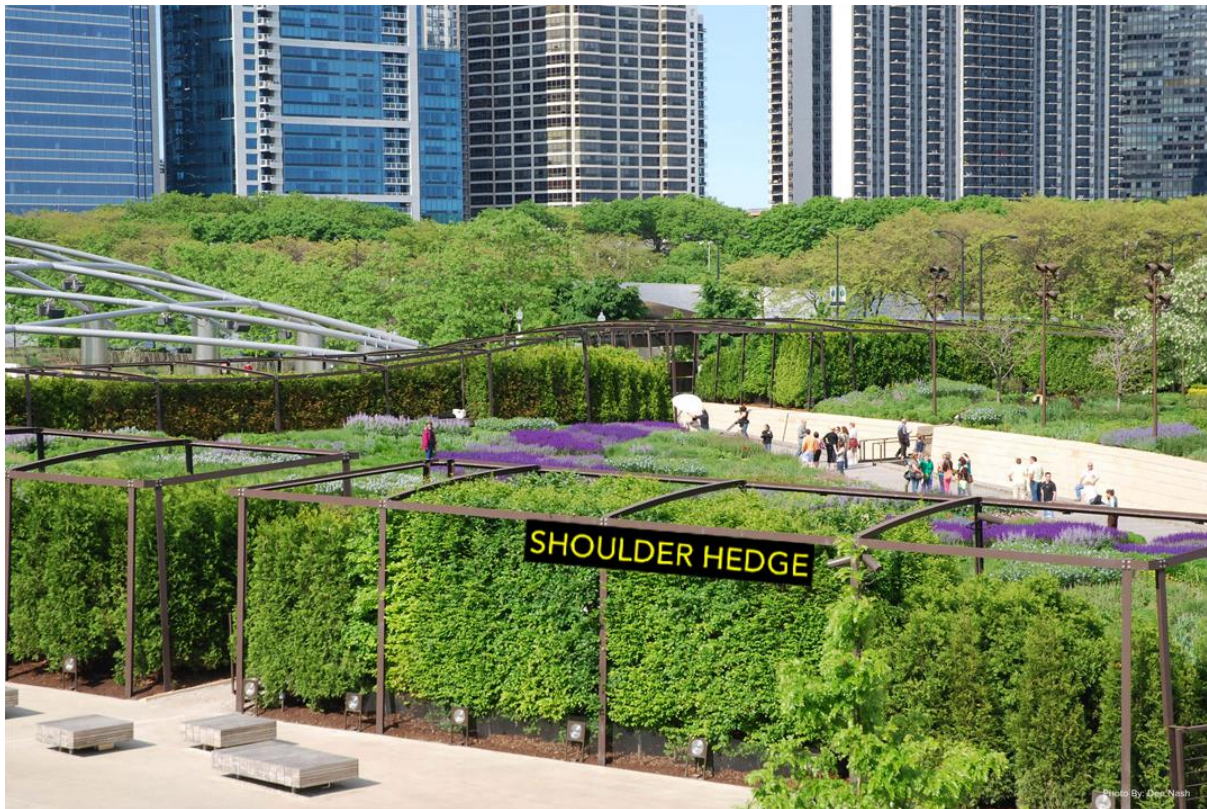


Fig. 1¹⁷: Shoulder Hedge at Lurie Garden, Millennium Park planted with Hornbeam, European Beech and Thuja.

This hedge runs along the northern and western flanks of the “Light Plate” of the garden¹⁸ and protects the delicate perennials growing in it from pedestrian traffic. The Shoulder Hedge, rising above the height of visitors, acts as frame for the view of the Chicago skyline from the park and offers a solid contrast to the “Light Plate” segment of the garden. The landscape has been planned as bold, dry, warm and bright space; it has been planted with herbaceous

¹⁶ Details on some *Thuja occidentalis* cultivars available at: <http://woodyplants.cals.cornell.edu/plant/255> OR woodyplants.cals.cornell.edu/plant/print/255

¹⁷ Image source: <https://www.gardendesign.com/millennium-park/>

¹⁸ Image of garden layout available at: <https://www.luriegarden.org/2016/04/12/successful-design-inspired-by-site-history/>

perennials, no higher than shoulder height. The area is dominated by the various colours, forms and textures of the plantings. As opposed to the plate, the hedge is dominated by tall trees and the colour scheme of the foliage is monochromatic or analogous, depending on the season. While on the plate the plants occupy the wide space more freely, the hedge is enclosed in the armature and growth is shaped to maintain the curved profile. In the overall layout of the park, it also balances the voluminous, visually somewhat heavier plant forms having used in the “Dark Plate”.

Along with Lurie Garden, the New York High Line (High Line Park) is among his most appreciated projects. Oudolf, speaking about his work for the High Line Park, NY (see 2.3.2 *ibid*), explains his choice of planting for the ‘Northern Spur’ of the park (the reader must note here that not all the species chosen for the High Line plantings are perennials):

The Northern Spur, a bridge of plantings over 10th Avenue, is one of Oudolf’s favorite parts of the High Line. “We have very shallow soil here,” he explained. “This is one of the places where the soil is only this deep so it was one of the places where I had a big doubt about if anything would grow here for a longer period. I used the most aggressive plants here – aggressive in the sense that they are very strong and durable and you can see they are still doing well.”¹⁹

Piet Oudolf’s work is thus exemplary of a practical and innovative approach to selection of plantings for urban parks which involves a preference for perennial species that are also visually appealing. The phenology of plant species that directly influences the park design and indirectly the experience of it for the visitor on any given day of the year. It must be mentioned that perennials make park maintenance a lot easier as repeat seasonal plantings are ruled out. A comparative study of costs incurred by planting and maintenance of annuals and biennials against those required for perennials may help highlight the economy of this preference as well.

More than with other plants, it is much more likely that the visitor will form associations with perennials in an urban park that they regularly or periodically visit. Over time, these plants can acquire meaning for them as not just perceptible elements in their experience, but more importantly as markers of events and memories. This connotations that the visitor forms in their mind for these perennials may even include personification of the plant.

¹⁹ Yonenda, Yuka 2016. INTERVIEW: Walking the High Line with its garden designer Piet Oudolf. Available at: <https://inhabitat.com/interview-walking-the-high-line-with-its-garden-designer-piet-oudolf/>

2. Frame 2 – Spatiality

Plants are the most essential and important structural components of an urban park intended as a green space, because their physical forms as well as arrangement contributes to the sense of the place within the bounds of the park. Plants are used in a variety of ways for placemaking, structurally demarcating functional spaces and for making semiotic space more explicit. This is akin to creating “positive space” in a painting by adding a coloured form on a blank canvas. The spatial arrangement of plants in the design of the park will draw attention to itself and hence also the surrounding space and lend the park its characteristic meaning. Terrestrial plants planted in the park are obviously sessile, however, the ground plan of the park makes it possible for a tree or group of shrubs and other perennials (1.3, *ibid.*) to continue growing in the same location that they were first planted, for a long time, without being uprooted or moved. Such plants therefore become constant structural components of the park design. This frame will therefore observe the plants as meaningful spatial elements.

In this frame, the territory of the urban park will be analysed as a designed semi-natural physical environment. It is observable through such an approach that the structure of the park is the foundational factor determining the scope of ‘semiotic interactions’ with the park and interpretation of the space therein.

Structure of and in the Urban Park Space – To design the landscape of a park is to correctly arrange its various features – such as water bodies, bridges, fountains, sculptures, lawns, flower beds, trellises, topiaries, tree groves, seats/benches, walking trails and paths, bicycle tracks, play areas for children, etc. – to create its spatial syntax (Mahmoud, Omar 2015). This is to be achieved in a manner that the division of space becomes (i) a guideline for visitors for orientation and movement, and (ii) also makes obvious the hierarchy of elements by making some elements more prominent than others. Among all the physical elements, what most prominently lends any park its distinct character – visually and spatially – are its green spaces. Every species has its own characteristic form, size and texture, and it also undergoes changes over its own growth cycle. Every plant occupies space differently, depending on its habit.

Ewa Lenard (2008) provides the description of a set of schemes to classify habits of woody plants, namely trees and shrubs. Figure 1 (below) illustrates the general outlines of natural crowns of various species of trees which are strong and healthy specimens growing undisturbed and in isolation. Figure 2 (below) illustrates forms that trees derive due to human activity or environmental impact.

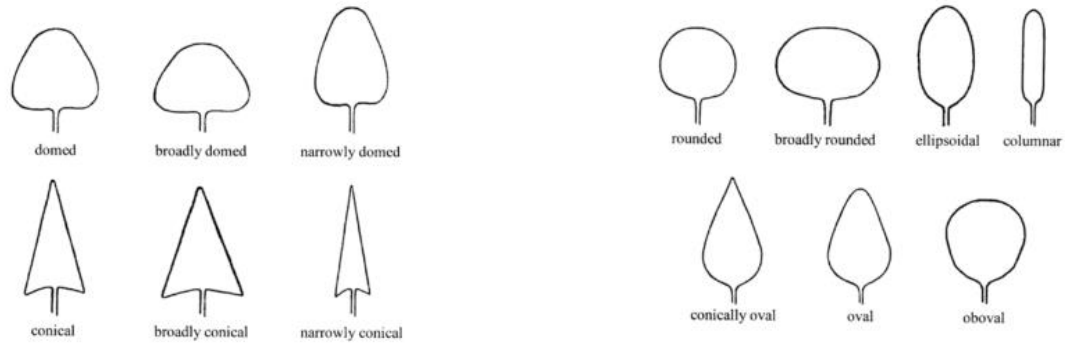


Fig. 1: Scheme showing types of natural tree habit Fig. 2: Scheme showing tree habits affected by human activity

As shown in Figure 1, the natural tree habits are (top row, left to right) domed, broadly domed, narrowly domed, (bottom row left to right) conical, broadly conical, narrowly conical.

As shown in Figure 2, the tree habits affected by human activity are (top row, left to right) rounded, broadly rounded, ellipsoidal, columnar, (bottom row left to right) conically oval, oval, oboval.

Further, Lenard also elaborates on how several factors determine the initial, intermediate and final habits of these plants:

- (i) Age – In case of broad leaved trees, the young trees have conically domed or conically oval crowns. In conifers, they are conical, while in fast-growing broad-leaved species the crowns are ellipsoidal. The crowns broaden to domed, oboval and broadly rounded respectively.
- (ii) Stem characteristics – The shape of the tree crown depends on angles of branches with respect to the main stem, and their length. Tree habits are broad when the branches are broad, long, thick and stiff, branching at an angle of nearly 90 degrees. Hanging branches result in a weeping habit of the tree, as seen in weeping willows, for example.
- (iii) Genetic predisposition for size – Each tree species is genetically predisposed to attain one of the sizes out of small (up to 7 meters), medium (8 to 15 meters), and large (over 15 meters)
- (iv) Human impact – Undisturbed trees have crowns growing lower and the branches may reach for the ground. However, during maintenance, lower stems and branches are removed (as opposed to pollarding) so that trees affected by it have a higher crown.
- (v) Influence of other trees – In compact multispecies tree stands, the fastest growing individuals attain a natural shape of the crown while in slower ones the crown is deformed.
- (vi) Impact of the inanimate environment – An important factor that affects tree habit. Under favourable conditions, as in the wild, trees attain full growth under favourable climatic and soil

conditions. Unfavourable conditions are typically offered by larger towns, cities, and roadside environments which causes trees to live shorter and not attaining their natural final size.

The factors explained above suggest indications and counter-indications in the choice of tree species for urban parks. It becomes important to note that urban parks, depending on their ground area, management conditions, and location can in fact offer trees favourable conditions to grow despite the presence or proximity of unfavourable factors.

It is this vast variety in the natural forms of plants that becomes an asset in the signification of space in the park. Space can be demarcated based on the habits of the selected plants and activities of the visitors are designed around this. In fact, it is the habit of the plant that characterizes the planted space as a recognizable feature of the park. Typical schemes use tall trees with or without a canopy for avenues, shade-giving trees to intersperse lawns with, sturdy shrubbery for hedges, climbers and creepers to cover built structures, etc.

Every park differs in structure. The master plan and the intended purpose and functions of the park together decide what physical forms the urban park takes. Moreover, the location of the park, not just within the city but also geographical, influences the structural design of the park. For instance, while traditionally, bandstands and gazebos are more common in European parks, pagodas are a common structure in Japanese parks. In the context of plants used in the park, this is based on climatic conditions, irrespective of whether the species are native or not. External visible factors such as the surrounding topography, presence and proximity of other structures also influence the choice of plants for their structure, and this choice can be made based on the size of the park and whether views surrounding the park need to be obliterated.

2.1 Urban park as Roland Barthes' 'marked space'

In his discussion 'Semiology and the Urban' (Barthes 1997 [1967]), Barthes refers to a city as formed of marked and unmarked elements, which can be analysed in the context of the urban park:

“[...] a city is a tissue formed not of equal elements whose functions we can enumerate, but of strong and neutral elements, or rather, as the linguists say, of marked and unmarked elements (we know that the opposition between the sign and the absence of sign, between the full degree and the zero degree, constitutes one of the major processes of the elaboration of signification). Apparently every city possesses this kind of rhythm. Kevin Lynch has remarked that there exists in every city, from the moment that the city is truly inhabited by

man and made by him, this fundamental rhythm of signification which is the opposition, the alternation and the juxtaposition of marked and of unmarked elements.”

The park as a whole as well as elements of its internal spatial design can both be considered as marked spaces. The urban park as a whole is, in opposition to the rest of the city, a strong element of the city. Maps, wayfinding guides and placemaking signage placed elsewhere in the space of the city will physically lead a visitor to the location of the park. The presence of the park itself is indicated by yet another set of signs as well as the structural components of the park like the entry points, boundary walls, waterfront edges, and if present, greenways leading up to it.

While the marked spaces are the strong elements, the unmarked spaces can be considered as neutral elements. The marked spaces thus become the focal points of observation and interaction for the visitors as opposed to the neutral, unmarked spaces. For example, while an extensively large lawn planted with short grasses can be considered as a neutral space which does not place a demand on the visitor to interact with it in a particular way, trails laid among flowers beds offer an invitation to explore the space by taking a walk among the plantings. A bench placed under a shade tree is a marked space too. Hedges can indicate the visitors to stay off the grass. Topiaries are marked spaces in that they can resemble familiar objects which are themselves not a direct part of the sign system of a park. Labyrinths and archways created with lianas are marked spaces which have the function of directing movement of the visitor. Mosaics created with herbaceous plantings are marked spaces meant specifically for visual appeal.

Barthes includes Lynch’s conception of urban semantics, and the discrete units in a city which can become signifying units. However, he also opines that Lynch’s conception of the city as a whole remains more *Gestalt* than structural:

“[...] he has the sense of *discrete* units; he has attempted to identify in urban space the discontinuous units which, *mutatis mutandis*, would bear some resemblance to phonemes and semantemes. These units he calls paths, edges, districts, nodes, landmarks. These are categories of units that would easily become semantic categories. But on the other hand, in spite of this vocabulary, Lynch has a conception of the city that remains more *Gestalt* than structural.”

This can be equated to the semantics of urban parks as well. When a parkgoer is in the park, they are not there to interact with one leaf, or a single flower in the park or each of the blades of grass individually. The experience of the park is not merely the summation of their

interaction with the discrete elements, but the perception of the overall qualitative effect of the park has as a whole, in other words, it is experienced as a *Gestalt* percept.

2.2 Svend Erik Larsen's concept of urban park as 'middle space'

The urban park has been addressed and defined as "urban middle space" by Larsen in his spatial and visual analysis of the urban park (Larsen 1994). The idea seems to stem from the 'middle space' between wild nature and the urbanized world meeting at a locus that is the garden:

"[...] the middle landscape carries a vision not of neutralizing the tensions of social life, but of dynamic interaction of natural and cultural forces constantly enlarging the realm of human independence and power. But, according to Marx, it also includes a contradiction. On the one hand the respect for and confidence in the unchangeable powers of nature, on the other the permanent quest for expansion and growth purely on human terms. The garden as a middle landscape comprises this insoluble contradiction, but also point to the utopian ideal of a naturally based human freedom that allows for a conflictual appraisal of both the garden and the machine without exposing the conflict"

The character of contemporary urban parks which remain embedded in cities without being actively removed by humans, is no different from this description, especially because of the fact that the deliberate or inadvertent preservation of nature within its space is usually the result of choices made by humans to do so, and not letting the space itself be taken over for any other purpose than offering humans space for interaction with nature in outdoor settings.

Larsen analyses that the openness of the horizontal open space makes distance a more fundamental feature in the park than closeness and states thus (Larsen 1994:549):

"What is lost in most visual semiotic analyses is the reciprocal 'spatial-sensual' relationship [...] which makes visibility a dynamic force in the creation of an *Umwelt* we construct and take part in. So, if we want to analyze a visual and thus spatial phenomenon, it is crucial first to determine its specific value as a text in cultural space. Now when we enter a park in order to analyze it as a visual sign, the focus of the analysis is not just its discrete visual components, but its visibility as a complex middle space—a neutral space defined by individually controlled and changeable body movements."

This supports my argument that if urban spaces are highly constructed multi-storey "jungles", then parks which intersperse such cityscapes can be compared to naturally occurring meadows or savannas that allow unrestrained visibility, lateral mobility, free movement over a large area.

It must be revised here that as one of the key factors that attracts humans to such unconfined spaces seems to have an evolutionary basis as elaborated in bipedalism. This has been hypothesized by the concept of biophilia (Wilson 2003 [1984], Ulrich 1993) (see 1.1, *ibid.*).

From among all the approaches that he considers to semiotize the urban park as a middle space in the city, Olmsted's proves to be the most comprehensive for the present discussion of the meaning of the place as afforded by it as a space opposed to the city (Larsen 1994:550):

“Olmsted carefully defines the distinctive features of the park in two dimensions: externally in their difference from the visual details (and sounds) of the surrounding city, internally in their mutual similarity and difference. In contrast to the city's gridiron street pattern, non-organic materials, square forms, constructed objects, grey and brown colors, vertical structures, and closed space, the park is dominated by curved paths, organic materials, round forms, natural objects, green and blue colors, horizontal structures, and open lakes and meadows. The clear-cut layout of the surface of the city, making you feel but an anonymous element in a formal structure, is replaced in the park by a less predictable layout which offers the visitor the opportunity to explore a route on an individual basis, to hide, to contemplate, to act on his own terms. Opposed to the fixed one-to-one relationship between the space of the city and its use (sidewalk for pedestrians, roadway for vehicles, etc.) the different sections of the park can serve more open-ended and temporary uses. **So, if the park is an iconic sign of nature, it is basically coded in its contrast to the city, not in its likeness to nature. It is nature on urban conditions.**” (my emphasis)

Larsen concludes his views by summing up that the spatial design of the park is an index which in fact underscores the intermediate character of the park, going between nature and culture:

“The park as a visual sign is not an iconic sign of nature, nor is it a symbolic sign of the ideal of human control of nature. It is a complex of visual indexical sign processes designating in public, in a continuous process of marking, the limits of individual freedom in relation to culture and nature. The park is one of the reagents of the conflict inherent in this freedom. *Et in Arcadia ego.*”

As much as parks are manmade creations, the living components in them – plants – are entities that have to live out their natural life cycles so that the park can continue to be this middle space. It is this aliveness of plants which is itself not the result of human agency. Phytocitizens are thus also autonomous beings that must be allowed to remain so if a park has to exist.

2.3 Accounts of landscape histories

London's Royal Parks (2.2, *ibid.*) used to be gardens privately owned by monarchy and are now urban parks. Here, the plants and the open spaces themselves, which are dominant features of the park, are managed to preserve the landscape; the only built structures being the various monuments. Similarly, brief accounts about some ancient gardens reveal the landscape history of those places and offer an example of the cultural activity of change in land use (of developing gardens) has brought about a change in the vegetation of those locations.

2.3.1 Ancient urban gardens

City gardens developed by royals: The City Gardens of Mesopotamia – Ancient urban spaces, then, have been no exception to the practices of mingling with nature in human-made settings or in other words, modified nature suitably for the purpose of “recreating” nature in a designed open space.

City gardens were planted by Assyrian royalty as early as circa 9th century BC in the cities of Nimrud and Dur-Sharrukin in Mesopotamia. Nimrud saw the creation of irrigation channels into the city and sowing the seeds and saplings of exotic plants brought back from travel to foreign lands (Dalley 1993); pines, cypresses, junipers, almonds, dates, ebony, rosewood, olives, oaks, some fruit trees, etc. were grown. In the new city of Dur-Sharrukin, fruit orchards of apple, plum and other trees were planted on hilly terrain by transplanting saplings from nearby areas and the naturalistic garden served as practice grounds for hunting lions and for falconry. It is evident that these parks were not created with the intention of greening the city. The developing and maintenance of these parks as green spaces was unquestionably neither the focus nor a concern in the 9th century BC. However, the process of their very creation led to a change in the topology of the area where they came up and, indeed, a change in the character of the green spaces. The introduction of new plants in the landscapes resulted in the formation of an entirely new ‘plantscape’. The planting of several species – native and exotic – added to the overall variety of plant species in the city.

As human settlements changed in form and composition over the centuries, governance and ownership of the spaces also changed hands. Consequently, the status of green spaces which remained and were preserved also evolved with time. A great number of expansive historical gardens which used to be a part of royal or aristocratic spaces were eventually opened to public and now have the status and function of urban parks. It is the historical importance and value

of these sites that has helped preserve these green spaces, and as a result, the space of the city continues to draw the ecological benefits offered by them.

Changing role and ownership of gardens: Beihai Park, Imperial Gardens to Urban Park – One such example is the Beihai Park in Beijing. Located within the 15th century palace complex of the Forbidden City (a UNESCO World Heritage), a part of this imperial garden was transformed into a large public park in the year 1925 (Rinaldi 2011). Greenery is present in the form of trees with luxuriant leaves and branches planted in the slopes of artificial hills and around these rockeries. The main feature of the space of the Court of the Stone Forest in the park is a large leafy white bark pine which provides shade for the courtyard; it is accompanied by oleander and big leaf hydrangeas (Chen 2009: 164, 183).

While the Beihai Park does have abundant greenery, it is defined predominantly by the architectural structures like the White Pagoda, temples, pavilions, rockeries and the three lakes. It can be said, therefore that all the green spaces in the park do not form its primary focal points.

2.3.2 Chandigarh, Freshkills park and NY High Line

The geographical location of an urban park within the city, its proximity to other parts such as residential areas, schools, shopping and commercial districts, and accessibility by various modes of transport, etc. are factors which indeed play a role in deciding how many and how frequently will people go to the park on a certain day and how much time will they spend there. However, this section attempts a discussion on the meaning of the real physical space of the park itself. We begin by considering how any park comes into existence, and the varieties of spaces which can become designated as an urban park:

2.3.2.1 Le Corbusier's work for Chandigarh – The most straightforward way for a park to come up in any city is when the city itself is new, and when the park has been incorporated in its establishment right at the planning stage. Let us consider the example of India's first planned city, the union territory of Chandigarh. Architects Le Corbusier *et al* included large open spaces, green landscaping and city parks in the master plan of this early-post-modernist city at the inception stage itself.²⁰ In other words, the parks here, and other green spaces, came to exist at the same time as the rest of the city. This also made it possible for a certain area of green or park space being made available per resident. (In the case of Chandigarh, green space available per person, as of 2001, was 17 sq. m., which is approximately 0.015% of the total

²⁰See "Open Spaces and Landscaping of Chandigarh" section in Chandigarh Master Plan 2031, available at: http://chandigarh.gov.in/cmp_2031.htm OR chandigarh.gov.in/cmp2031/open-space.pdf

area of the city's master plan.²¹). In such cases, the location and size of a park are predetermined. Furthermore, its internal spatial design and landscaping has either a thematic concordance and continuity with the concept of the city or tries to contrast the conglomeration of forms populating the rest of the city.

Unless a city is remodelled partially or entirely, the landscape plan of it rarely undergoes major restructuring. Resultantly, and over time, parks start to become landmarks in the cityscape. People start to associate with them as spaces and places having their own separate and evolving identity; the park itself thus acquires a semiotic presence, to begin with. As an accessible space open to people for interaction, the park connects to the rest of the city not only geographically but also as a thriving socio-cultural dais. However, the perceptions of people towards the parks discussed below tend to contrast one another. In the case of Freshkills, the response to the as yet ongoing land conversion is already seeing a trend of negative reviews being generated organically. High Line Park has been accepted and appreciated and as a result is a popular space for recreation and mobility.

2.3.2.2 Freshkills park and New York High Line – In contrast to the case of planned new cities in which green spaces are an inherent feature, degraded spaces or places that have fallen out of their original use are candidates which can be redeveloped into parks and parklands. 2 examples of such spaces are:

- A. Freshkills Park, NY, USA (Conversion of a landfill area)
- B. New York High Line/High Line Park, NY, USA

A. Freshkills Park, NY, USA: Conversion of a landfill area – The development of the Freshkills Park (Staten Island, NY, USA)²² can be cited here as a space that since 2005 has been undergoing gradual revival from being an approximately 2200-acre landfill to a public parkland (Corner 2005). Corner has given the outline 6 stages of the transformation of the land unfolding over a span of 30 years as projected in the images below (Fig. 1 and Fig. 2). During this time the landfill will be transformed from being a “mound of toxic waste to a lifescape” via the stages envisioned.

²¹ See “Master Plan Area” section in Chandigarh Master Plan 2031, available at: http://chandigarh.gov.in/cmp_2031.htm OR chandigarh.gov.in/cmp2031/mp-area.pdf

²² Official website of Freshkills Park: <http://timeline.freshkillspark.org/>



Fig. 1: Freshkills Park draft master plan (May 2005 version), stages 1,2 and 3.

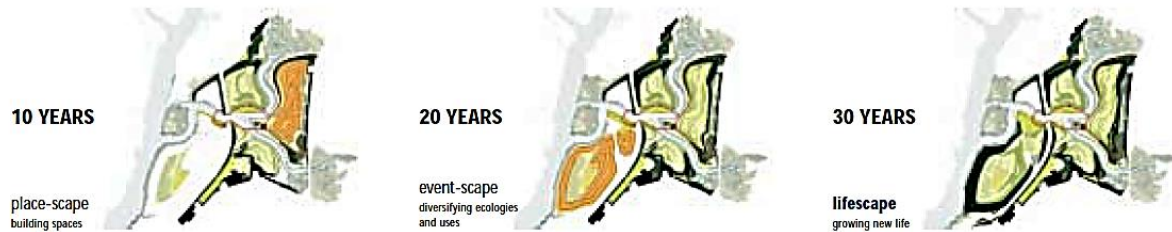


Fig. 2: Freshkills Park draft master plan (May 2005 version), stages 4,5 and 6.

The plan for planting involves propagation of vast open grasslands in the interior using native prairie and meadow species. For defining a spatial threshold of the site, a 240-meter-thick rim of dense woodland has been used to keep the interior unfragmented. Clearly, the woodland rim will indicate to the visitor the terrestrial limits of the seemingly endless space. Additionally, it will also serve as a transition zone between the parkland and the varied environment surrounding it²³, so that the transfer to and from it would not deliver a sense of abrupt change of scenery.

Freshkills is a case which illustrates how the earlier use of this land, that was converted to a green space intended to invite visitors, in fact may become an obstacle in the aim of garnering public acceptance for the park. Converse to what might be expected, the project could likely invoke a widespread negative response. Katherine Thompson, who is herself an erstwhile resident of Staten Island offers a realistic perspective²⁴:

Peeling back the layers of Fresh Kills Landfill and now the future Freshkills Park reveals a much starker, scarier reality than what the utopian illustrations of the landscape attempt to indicate, and, in a sense, hide. On a purely surface level, the park is a dramatic improvement for residents—the landfill most likely negatively impacted their health and damaged the

²³ See “B. EXISTING CONDITIONS” for details on areas surrounding the park have been mentioned in ‘Chapter 9: Neighbourhood Character’ available at:

https://www.nycgovparks.org/sub_your_park/fresh_kills_park/pdf/FGEIS/Vol11/09_Neighborhood.pdf
For further reading: <https://www.nycgovparks.org/park-features/freshkills-park/public-review>

²⁴ Thompson, Katherine 2017. The Grim Reality Hidden Beneath Freshkills Park’s Bright Facade. Available at: <http://www.bu.edu/writingprogram/journal/past-issues/issue-9/thompson/>

reputation of the borough. Since its inception, Freshkills has represented extreme human manipulation of nature; however, in contrast to the initial decimation involved in filling the land, we are now, in a sense, filling the land again, except with fields, playgrounds, and restaurants. Underneath this immediate benefit, however, lies a much more widespread and evasive issue—our poor relationship with nature. Involved in this change is a great deal of irony, as below a perfectly constructed park will lie a once neglected, abused wasteland. However, even more pressing is the metaphorical symbolism that this morphing represents. In building something beautiful on top of something that was once so tarnished, humans are declaring a superiority over nature, one which may extend to other cases. This conception is an overtly negative one, as it sponsors the belief that human destruction of nature is acceptable, so long as we can swiftly patch this devastation with something we find appealing.

The meanings of urban parks for the visitors are thus never only synchronic. The history of the site of Freshkills and the human-Nature relationship that it is reminiscent of does not make it an ideal space for seeking positive or restorative experiences.

B. NY High Line (High Line Park, NY, USA): Repurposing of abandoned transportation infrastructure – The iconic New York High Line Park²⁵ is a great example of a paradigm shift in choice of spaces for creating an urban park as well as the repurposing of a dysfunctional large space running through a busy suburb in a metropolis. A 2.33 km elevated railway route, the last train ran on the tracks in 1980 and it was inaugurated as the High Line Park in two phases, in 2009 and 2011; work started on the repurposing in 2006. In the while between 1980 and 2006 this elongated stretch of construction had been overgrown and colonized wild plants. The team of designers that were chosen to work on it (Aalto, Ernstson 2016) conceptualized the repurposing of the space as a design that ‘balanced the essence of the abandoned structure with the demands of a public[al]ly accessible park. One of the designers of this park is Dutch landscape architect and garden designer Piet Oudolf whose design approach will be discussed later in 5.2.2 (ibid.). One of the key ideas in the design choices was to retain the sense of wilderness even after the removal of the overgrowth. To achieve this, seeds from the previously growing vegetation were collected and used in the final plantings.

²⁵ Video of Walking tour of The High Line in Manhattan, New York City. Available at: <https://www.youtube.com/watch?v=jv4m41pbOJE>. Also see Burden, Amanda 2014. How Public Spaces Make Cities Work (video mentioning how the space for the High Line was acquired for an urban park at 04:19 minutes). Available at: https://www.ted.com/talks/amanda_burden_how_public_spaces_make_cities_work#t-604695

After the initial plantings, the landscape has continued to be self-seeded, meaning that it is allowed to propagate and grow on its own without being pruned or removed. This approach was suitable for the space for two reasons²⁶:

1. The stretch of the park is more than 2 kms and at an elevation which means an excessively hands on maintenance of the plants would have proven to be practically cumbersome and would have involved a complex, all year-round maintenance system. Although the gardeners of the park do carry out maintenance to a certain degree, this is done to an extent that is minimally necessary. This is done only to maintain the ratio of the accent species and to keep the invasive ones in check, so delicate species are not replaced by vigorous overgrowth.²⁷ The 210 species of perennials, grasses, shrubs and trees were chosen for their hardiness, sustainability, and textural and colour variation, with a focus on native species (not all species are native).²⁸

2. A minimal hands-on approach meant that the forms of plants remained natural and the space of the High Line, even post the design intervention, seemed reminiscent of the original wild growth, thus becoming a narrative symbol of the history of the space.

Most of the plantings are sturdy meadow plants which is a choice that is meaningful in 2 ways:

1. The organic lightness of the plants serves to oppose the character of the space of the High Line itself, which a formidable seeming, visually heavy structure even at eye level. The natural forms of the plant also oppose the static, heavy and geometric forms of the high rises surrounding it and densely urbanized inorganic landscape below it.

2. Medium height trees have been sparingly used, and that too sparingly, so that openness is maintained, the foliage is much more varied, ground cover is more abundant than tree plantings can offer, and the plantings remain lighter in weight. Plants of mostly herb habit allow for the forward and upward gaze offered by the open stretch of the high line structure to remain largely uninterrupted, although the left-right depth of vision is low at some locations due to surrounding architectural structures.

²⁶ See “Master Plan Area” section in Chandigarh Master Plan 2031, available at:

http://chandigarh.gov.in/cmp_2031.htm OR chandigarh.gov.in/cmp2031/mp-area.pdf

²⁷ Pettis, Andi 2014. How the High Line Gardeners Keep It Wild. Available at: <http://www.thehighline.org/blog/2014/06/10/how-the-high-line-gardeners-keep-it-wild>

²⁸ Full plant list of the High Line. Available at: <https://web.archive.org/web/20100402194502/http://www.thehighline.org/design/planting> OR https://web.archive.org/web/20091229153418/http://www.thehighline.org:80/pdf/plant_list_full.pdf

The High Line park being off the ground, no plants that will develop deep root systems can ever grow or be grown there. A continuous or substantial canopy is therefore not to be expected in this space. This in fact becomes an aspect supporting the purpose of the park which has been designed to offer a view of the city from an elevation.

A comparison of ideas about the urban park as given in marked space, middle space and repurposed space, it is evident that simultaneously with and because of the progress of urbanization, a change in attitudes towards space in general and the urban park space in particular has also been undergoing, if not an evolution, then definitely a gradual change over the decades. Urban parks indeed have even gone beyond these concepts to become locations of the complex interactions of heterogenous sign systems.

3. Frame 3 – Semiotic Considerations

In this frame the multimodal perception of parks is first discussed. This aspect depends on the physical experience of the park and plants in it. The discussion further applies semiotic concepts which serves to emphasize a scientific outlook on the meanings of an urban park and its plants.

3.1 Multimodal perception of plants in urban parks

An urban park is a site where phytocoenoses are allowed to mature. This process invites the visitors to witness the unravelling of the phases in the life cycle of plants. Since leisure and recreation are among the basic intended functions of any urban park, visitors can have more time for a multisensory experience of plants, taking the time to experience greens not only visually, but also through olfactory, tactile, and even auditory channels.

Plants in urban parks influence how visitors spend their time and where they go. For example, the tradition of *hanami* (cherry blossom viewing) in Japan mobilizes almost the entire country to visit parks and have picnics there under *sakura* (cherry) trees laden with their spring blossoms. An exceptionally interesting example is the periodic blossoming event of *Karvi* (*Strobilanthes callosus*, a plietesial shrub species endemic to India) that blooms only once, towards the end of its 8-year lifespan. Among many other places, it also occurs on hill slopes in Sanjay Gandhi National Park – an 87 sq. km. protected area right in the middle of Mumbai city – and in the years that it blossoms, guided tours are arranged to Sanjay Gandhi National Park for the viewing.²⁹ During the blossoming or fruiting season, sightings of insects, birds and animals can be frequently and conveniently done within the space of the city without having to travel.

Urban parks can become venues for such events driven by the phenology of native and endemic species inhabiting it. This offers city dwellers and visitors an opportunity for engagement with plants in response to their chronobiological rhythms. Moreover, for local citizens, it is an invitation to appreciate plants which they are familiar with through their own history, culture and folklore.

In addition to phenology, multisensory interaction with plants certainly enriches the experience of visiting the park and also lets it be more inclusive, so that in addition to being visual

²⁹ “A flower blooms” by Dore Bhavya – an excursion report for a 2016 visit to view Karvi blossoms in Sanjay Gandhi National Park. Available at: <https://www.thehindubusinessline.com/blink/explore/a-flower-blooms/article21671777.ece1>

spectacles, the fragrances and textures of the plants are also equally important aspects of the overall experience. In Cape Town, South Africa, an Outdoor Blind-Friendly Park with a play area opened in 2016³⁰. Along one of the borders of the park, indigenous scented plants like lavender, wild garlic and rosemary have been planted so that the experience involves stimulation of the sense of smell, and also to help the visually impaired visitor to navigate. Urban parks can also accommodate gardens designed for sensorially challenged people: the *Blindengarten* inside Kurkpark in Bad Homburg, Germany is a “smell and touch” garden with a fountain in its center as an acoustic point of orientation for visually challenged visitors.³¹

The designed impingements of smells and sounds in these parks become signs of the space and location. It must be mentioned however, that in these cases, since the visual input is absent the sign systems comprised of olfactory and auditory cannot be termed, as an exception as ‘Green’ Sign Systems in the literal sense from the perspective of the visually challenged parkgoer.

3.2 Urban park as semiosphere

From a biosemiotic perspective, the urban micro biosphere of an urban park is also a rich semiosphere for humans replete with possibilities of synchronically and diachronically delving into the multi-layered meanings that plants, as perceptible physical objects as well as representational objects, convey to us. Sociocultural perceptions projected onto plants also plays a role in the perception of the urban park as a whole and influence the experience of visiting it. The semiosphere frame is therefore an approach to exploring the connotative meanings of plants in the semi-natural, designed setting of urban parks. This approach allows considering the semiotic interactions with plants in urban parks at both levels – at the level of plants and the park as an open green space as a whole. In this frame the park is being considered as a site for the overlapping and interaction of multiple sign systems (see Maran 2004).

The semiosphere (Lotman 2005 [1984]) is a semiotic continuum that allows and is realised by the intercommunication and convergence of semantic systems. As a semiotic space defined by its own unique mechanism which is a sign system by and in itself, the semiosphere is demarcated from its extra semiotic territories – which, in our case are defined by the material

³⁰ “Cape Town set to build its first blind-friendly outdoor park”. Available at: <http://www.designindaba.com/articles/creative-work/cape-town-set-build-its-first-blind-friendly-outdoor-park>

³¹ ‘Blindengarten’: https://www.bad-homburg-tourismus.de/en/entdecken/freizeit_kurpark.htm#acc_37141

city and its sociocultural landscape – by the boundary. This boundary also separates the semiotic space of the urban park from that of the rest of the city.

One of the things that can be observed through the frame of spatiality (Ch. 2, *ibid.*) is that the structure of a park is created by the heterogeneous and nonuniform arrangement of variable biotic components and nearly constant abiotic built components. Therein, an attempt is made to apply design principles in a way that the encoding efficiently and unambiguously communicates about the intended or suggested experience of the place. It might be possible to find instances of “colorless green ideas sleeping furiously” (Chomsky 1957: 15) in the park, meaning that there might be sculptures, fountains or green spaces but they might not add meaning to the park as a whole despite being placed there³², and thus may fail to become a part of the semiosphere despite occupying space in it. Moreover, the physicality of even a well-designed park, where such perfunctorily used elements are absent, can be clearly understood on the basis of semantic oppositions as explained by Martin Krampen in his discussion about ‘semantization or desemantization of the environment in urban semiology’ (Krampen 1979:33), as applied to the urban park:

“Basing his work on Greimas’s structural semantics (Greimas, 1966; 1974) Fauque (1973) developed an urban semiology based on the ways in which people perceive the city. According to Fauque the only possible starting point is the semantic oppositions [that is, of emplacement (central versus peripheral, close versus far) or of quality (dense versus clear)] which determine people’s perception of the city and which may be established by analysing their spoken views of the city. The preoccupation with the basic elements of the city (analogous to those of language) is also evident in Fauque. Every specific ‘urbeme’ consists of a set of specific characteristics, namely, its ‘semes’, which are related hierarchically or in separate constellations. Thus a given architectural structure (for example, a tower) will have specific qualities (for example, density), a specific emplacement (for example, central), and will acquire meaning only as a result of the particular arrangement of these characteristics; the meaning of the tower would change if its particular qualities or emplacement were to change. The question of the ways in which ‘urbemes’ are related to form the city as a whole involves thus the question of ways in which people perceive spatial juxtaposition (above, below, at the side of, in front of, behind, etc), and which

³² McDonald, Frank 2009. “Random sculpture and hideous orbs spoil Merrion Square Park”. (Report on the inaccuracy and randomness of the redesigning of Merrion Square Park by inclusion/renovation at different times of such elements which, according to the author, rendered the park a ‘hotchpotch design’ and a misfit among parks and gardens of European Garden Heritage Network as of 2009.) Available at: <https://www.irishtimes.com/culture/random-sculpture-and-hideous-orbs-spoil-merrion-square-park-1.716888>

juxtapositions evoke different emotional responses (that is, which juxtapositions are seen as natural, pleasant, unpleasant, unusual, etc).

An exploration of the semantics of the urban park is thus based in the physical experience of it which is made possible through the real-time sensory perception of the park. It follows that the cognition of the place cannot remain purely sensory. What comes into play here is the role of auto-communication (Kull 2015: 259–260) which draws from *a posteriori* cultural knowledge serving as *a priori* instructions for the environment's experience. Meaning that, as explained in the quote above by Krampen, the prior cultural knowledge of the people and their perception of the elements in park as well as their sense of familiarity with the juxtaposition of the elements will have an effect on their sense-making process of the park. The semiotic boundary of the park thus lies in this very juxtaposition itself – the park offers new unfamiliar arrangements of elements which are otherwise familiar to the visitor. This mosaical sign system acquires a semiotic reality of its own which is different than that of its unitary signs and undergoes changes diachronically in response to the variations in its composition and elements, in the context of this work, the object is the urban park as a whole. As we saw in the previous frames of analysis (Ch 1. And Ch 2., *ibid.*), prime significance in this evolution is the quality of the plants in the park being alive, and the transformations they undergo with time which is one of the dynamic parameters of a park.

The semiosphere of the park assumes existence, emerging from the its structure and via the visitors' sensorial channels, by their perception of it as a whole. Signs in the park are not embodied in its individual elements but embedded in the perception that the design of the park makes possible.

Nöth (2014) describes the spatial turn as it became applicable as one of the defining characteristics of the semiosphere itself. Applying their examination of these aspects to the current discussion helps establish a connection between the metaphorical semiosphere and the semiotic space of the urban park, with its features of heterogeneity, diversity, boundaries, and semantic perceptions. These emerging as much in and from the physical space of the park as in the mind of the visitor. When experiencing the park at a physical level, the visitor is in fact simultaneously cognizing the space. Their prior cultural experience influences how they cognize the space, there is certainly a degree of 'expectedness' which is based in prior cultural exposure and a sense of familiarity. The more the park matches these expectations, the less is the information value of it for the visitor.

The same process is at play even when the park visitor is perceiving plants. An empirical study on the semantic value of plants in the perception of space (Özbilen, Kalin 2001) shows that plants carry symbolic meanings and can be signifiers with denotations and connotations. Plants act as active identifiers of space. Plants and spaces can evocate each other if they have a shared meaning system. The meaning of a space is defined by the functions of the plant and this principle can be used in the designing of conceivable environments.

3.3 Martin Krampen's 'system of sets'

The forms of the plants are structural components which compose the park as a whole into a meaningful structure along with landscaping elements like say, natural or humanmade waterbodies. This can be explained further on the basis of Martin Krampen's theorization about considering sets of architectural objects as integrated wholes (Krampen 1979:67):

“In any event, in urban design the meaning of the whole should ideally be established before one establishes the meaning of its parts, as the parts become meaningful only in terms of the whole. In this sense a semiology of architectural conglomerates would be logically superordinate to a semiology of architectural components.”

Drawing a comparison of the statement above with the structure of an urban park, it can be said that the park is also a conglomerate of natural and humanmade components which together lend meaning to the space owing to their specific permutation-combination as decided by the spatial design. Also, an object outside the urban park acquires a new meaning when used a part of the park. To bring in a botanical example, the *Lawsonia inermis* (the *henna* plant) is a common hedge plant in parks and gardens in India whereas on agricultural farms, it is cultivated as raw material for *henna* products.

Krampen further adds (Krampen 1979:67) (The point of diachronicity has been discussed later in this work in 5.2.2):

With this in mind it becomes important to look diachronically at architecture (as a system of sets of architectural objects, or their properties) in order to emphasize the processes of change which occur historically within this system and the oppositional structure of sets it represents.

Where Krampen explains about 'set theory as a tool for constructing a model of cognition', he also discusses the above-mentioned oppositional structure of sets (Krampen 1979:55):

“This type of calculus can be called a system of sets. Since each set in this system is defined in reciprocity to each other set, the system forms a structure. The relation which all the sets have in common with all the other sets in the system is that of opposition. The system of sets thus forms an oppositional structure. An object is therefore recognized by establishing its membership in one of the sets of a system of sets, all of which have been subjected to the calculus of difference and identity. Knowledge of one object thus implies knowledge of all other objects pertaining to the calculus, on the grounds of the reciprocal nature of the relationship of difference.”

This statement strongly complements the concept of Uexküll’s *Gegenleistung* or counter-ability as will be discussed in the following subchapter.

3.4 J. v. Uexküll’s *Gegenleistung*: counter-ability of urban parks

Drawing an analysis from the observations of the case study above, it is highlighted to us that although the spaces between a city and everything that is beyond its geopolitical limits are indeed seamless, urban parks are not natural forests. They don’t materialize themselves. We are reminded that all urban parks are, essentially, intentionally created semi-natural environments offering open spaces where a range of semiotic interactions may take place, owing to their being designed primarily for humans. However, in comparison to biologically poorer natural habitats like those of deserts, and especially in contrast to non-green “concrete jungles” that most cities and towns tend to be (in a large part of their physical composition), urban parks acquire significance as inviting green oases.

An urban park, thus, becomes a counter-space responding to the human need of open meadow like areas, owing to its character and function.

Jakob von Uexküll’s concept of *Gegenleistung*, or counter-ability, which has been translated by Martin Krampen in his paper on semiotics of objects (Krampen 1994:516), makes for a strong foundation of this definition of urban parks:

“Jakob von Uexküll regarded the meaning of objects pragmatically as ‘counter-ability’ [*Gegenleistung*] fitting human abilities or needs. In his wonderful description of a stroll through town (Uexküll 1980 [1913]), he anticipated a modern ecological approach to the semiotics of objects:

Everything—indeed everything we get to see is adapted to our human needs. The height of houses, of doors and windows can be reduced to the size of the human

figure. The stairs fit our gait and the banisters the height of our arms. Each single object is endowed with sense and form by some function of human life. We find all over an ability [Leistung] of man which the object sustains by its counter-ability [Gegenleistung]. The chair serves seating, the stair climbing, the vehicle riding, etc. We can talk about something being a chair, a stair, a vehicle without misunderstanding, because it is the counter-ability of the human products which we really mean by the word which denotes the object. It is not the form of the chair, the vehicle, the house which is denoted by the word, but its counter-ability.

In the counter-ability lies the meaning of the object for our existence. This counter-ability is what the constructor of the vehicle has in mind, what the architect thinks of when designing the plan of the house what the butcher thinks of who slaughters the ox, as also the writer writing the book, the watchmaker fabricating the watch. The gardener trimming the trees and plant-ing the flowers prepares them for counter-ability. Everything surrounding us here in town has only its sense and meaning by its relationship to us humans.”

This concept of counter-ability applies to a park when it is considered as a semiotic whole. A comparison of the counter-ability of the city for humans against those made possible by a park is evident in the corresponding pairs of features as below (Table 2):

City	Urban Park
Activities centred around economic gain, Focus on consumption of resources	Recreational activities, No focus on consumption of resources
Mobility by vehicles, transport infrastructure, multiple sources of information, space for inhabitation	Clean air, space for natural movements like walking and running, low information load, sense of pleasantness, soothing visual environment, ecologically rich spaces
Frequent human interaction possible for a variety of activities	Sparse human contact, more interpersonal distance
Mostly social environment with presence of only humans	Allows contact with organisms of multiple species
Services rendered to humans by humans	Humans deriving benefits given by other species
Regular geometrical layouts of spaces, 3- dimensional space occupied by manmade materials	Organic, natural forms, 3-dimensional space filled with manmade as well as natural forms and materials

Table 2: Features of urban parks which are a counter-ability with respect to the features of the city.

The impingements that the city affords for humans are geared towards functioning of humans as citizens driven to fulfil social requirements. The park has affordances that serve functions fulfilling the more biological, and perhaps pre-semiotic, necessity of experiencing ones surroundings. Parks are spaces that feel 'alive' thanks to plants, birds, insects and herbivores. The very presence of the urban park is an indication that humans modify surroundings not only to respond to social needs, which are limited to interactions among humans, but also for proximity with Nature and non-human organisms.

4. ‘Phytocitizens’ – A New Designation

The Kingdom Plantae has inhabited the Earth long before humans have. Humans have expanded their own territories by appropriation and destruction of habitats of plant (and animal) species. Proliferation of humans has led to entire forests being razed down, marshlands being reclaimed, hills and mountains being dug through, open grasslands and meadows being cleared and built upon, all to occupy humans in their dwellings. The fact cannot change however that we depend on communities of nonhuman organisms for our survival. The redressal of our own impact on the planet and all its other life forms is therefore of immense importance. However, we are perhaps yet to reach a stage where we have acquired the capability to “save the planet”. Despite our activities which lead us to alter and disrupt the biogeochemical and atmospheric cycles on the planet to a great capacity and to annihilate several life forms, we have yet to map, even with our worldwide studies, how every single human activity is affecting the health of the planet. Even so, in urban habitats, particularly, we can find that some environmental issues are more common and consistent than others among all major cities, owing to the fact that cities tend to function on common principles across the world – namely, those of economic development, which inevitably leads to depletion of nature anywhere. In the context of cities, then, some of the main concerns remain: air pollution caused by (gaseous and particulate) emissions and noise, stresses caused by crowds (and hence low interpersonal distance (see Hall 1966, for the concepts of ‘Proxemics’ and ‘Social Distance’) and lifestyle, and ever decreasing space for outdoor recreational activities. As we read in Chapter 1, these concerns find mitigation, if not at once resolution, in the range of benefits that urban parks have to offer.

Therefore, to take a more pragmatic and realistic approach (than of “saving the planet”) towards preservation of nonhuman life, especially plants, we must focus our attention to solutions which will help highlight the critical position and role of plants in the life of humans and in the planet’s ecology at large. Efforts to achieve this abound around the world – we know from our own exposure to different discourses that professionals, volunteers and researchers from several disciplines come up with a myriad of ways to stress upon the importance of plants for humans. It must be emphasized that our understanding of and relationship with plants is a sociocultural construct that goes beyond our need for plants as defined by our biological dependence on them. The effect that this perception has on our dealings with the botanical world is visibly pronounced in settings and processes wherein plants are highly affected by human activities as also in territories which are predominantly human. Humans are, first of all, plants predators but

plants have also made way into human death rituals to adorn pyres, caskets, and graves; our relationship with plants pervades all phases and spheres of human life.

As stated initially in the introduction, the concept of ‘phytocitizens’ works towards the goal of plants being considered as a city’s inhabitant or denizens. A framework and guidelines to give plants this status provides ease to semiotize their meanings and make policies about them. This can be a term used globally to address plants in urban parks. The reason that plants in urban parks should be chosen as phytocitizens are 2: (i). Plants in urban parks are maintained, monitored and interacted with on a daily basis, and (ii) An urban park is a human undertaking for which policies can be made and applied efficiently.

To be nominated and recognized as a phytocitizen, plants or plant species in the park must meet at least one of these criteria listed below. The title of Phytocitizen will act as a single, unifying signifier. Phytocitizens will thus become a global community of plants housed in urban parks around the world. This affects existing plants and those which will be planted in the future. Moreover, the signifier will support the transference of values like reverence, admiration, respect, awe, gratitude towards these plants.

Plants in urban parks which belong to (one or more of) the following prominent categories of plants which, when present in urban parks (as meant in this thesis; see ‘Introduction’), will qualify as phytocitizens:

1. Plants which are heritage trees or ancient trees. (see Jim 2017)
2. Plants belonging to an ecological or cultural keystone species (see Garibaldi, Turner 2004) or those that are keystone hosts.
3. Plants which can be or have been categorized as charismatic megaflores (see Hall *et al* 2017).
4. Plant species having medicinal value.
5. All individuals of plant species belonging to one these classes of assessment categories in the IUCN red list³³: Extinct in the wild, critically endangered, endangered, vulnerable, lower risk: conservation dependent, near threatened.
6. Plant species which have been declared as a protected species in its respective country/region.

³³ The IUCN Red List of Threatened Species. Database of assessment of Kingdom Plantae by threat level available at: <http://www.iucnredlist.org/search>

7. Plants which are being grown in an urban park as part of a conservation programme.
8. Plants which have cultural value and significance.
9. Plants belonging to a native species (see Kull et al 2003).
10. Native or naturalized species which are found to be remarkable on some way.

Portland's "Number 313" is an example of how the stories associated with plants add to their value as phytocitizens:

The genus of Dawn Redwoods now called *Metasequoia*, is a common fossil of the northern hemisphere from the Late Cretaceous (90mya) to the Miocene era (5mya). In the IUCN Red list, it has been assessed as an endangered species (Farjon 2013). It is classified among the plants and animals termed as 'living fossils', this genus was considered to have become extinct. However, a living specimen belonging to this genus was discovered in 1941 in present day Hubei in China and it was given a specific epithet – *glyptostrobooides* – in 1946.³⁴ Thereafter, in 1948, an expedition from the Arnold Arboretum of Harvard University collected seeds from the tree in China and brought them back to the US distributing them to arboreta for growth trials. One of the locations where it was successfully grown is the Hoyt Arboretum of Washington Park, which is a public urban park in Portland, Oregon (Hoyt Arboretum was annexed to Washington Park in 1922). This dawn redwood bore cones in 1951 and became the first tree of its species to bear cones in the Western hemisphere in 8 million years. On 30th April 2010, it was conferred the status of a Portland Heritage Tree *Metasequoia glyptostrobooides*.³⁵ In the official documentation of Portland's Heritage Trees by Portland Parks & Recreation Urban Forestry, this tree sits in the list of heritage trees at number 313.³⁶

³⁴ *Metasequoia glyptostrobooides*: https://en.wikipedia.org/wiki/Metasequoia_glyptostrobooides

³⁵ "Dawn Redwood Named Portland Heritage Tree". Available at: <http://www.hoytarboretum.org/collections-and-conservation/dawn-redwood-named-portland-heritage-tree/>

³⁶ Portland Parks & Recreation Urban Forestry 2016. *Heritage Tree Program Guidebook 2016*. Available at: <https://www.portlandoregon.gov/parks/article/639367>

Conclusions

The study of plants in urban parks by applications of the three frames, namely, Biosphere, Spatiality and Semiotic Considerations reveals that plants have multifarious meanings for the park goer and the researcher. The frames analysed the urban park as an inherently as well as potentially meaningful space.

Plants are obviously indispensable to humans, especially in the demanding and stressful urban environments – not just as ecological symbionts but as living organisms which contribute towards enriching the semiotic space of the city.

On the basis of different semiotic theories and viewpoints, Spatiality and Semiotic Considerations proved that plants in the urban park are not present merely for decoration of the space and when perceived on the basis of cultural and theories, carry a range of meanings unique to the urban park. The meaning of the park emerges through the confluence of the intended meanings that the design of the park and of visitors' perception of and interaction with the park. It is on the basis of these different perspectives that it was seen how parks can be viewed in the context of the city.

A common theme emerges from the perspectives offered by the frames of analysis: that of the urban park being a spatial and semiotic hybrid space which acts as a counter-balance to the rest of the city.

Phytocitizens is a concept that suggests bringing together all plants in urban parks under one all-encompassing signifier, signified by the same 'sign-vehicle' in order to denote and connote their ecological, cultural and socio-political significance for humans. Phytocitizens is a new designation to signify and address all such plants together. This can prove to be a great convenience when highlighting issues related to these plants, especially in the area of conservation and preservation of biodiversity. This term can find use in the vocabulary of different academic disciplines including sciences and humanities, and in the discourses of media as well as socio-political discussions. The author thinks that further research is required to concretize this contemporary and futuristic conceptualization on the basis of empirical as well as theoretical research.

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Kokkuvõte

‘Taime-kodanikud’: taimed linnaparkides ja nende tähendused

Magistritöö eesmärgiks on uurida, kuidas linnaparkides olevad taimed saavad inimeste jaoks linna semiootilise maastiku tähenduslikeks elementideks ja kas multimodaalne vaade nende tähenduste osas võib viia uutele tõlgendustele taimede olulisuse osas linnaparkides.

Linnapargi taimi vaadeldakse semiootilise analüüsi raamistikus kui pargiruumi füüsilisi komponente, elavaid märke, mis mõjutavad positiivselt linna ökoloogiat ja millel on olulised sotsio-kultuurilised tähendused inimestele.

Analüüsis rakendatakse kolme erinevat lähenemist, mis toetavad neologismi taime-kodanikud (inglise keeles: *phyto citizens*). Viimane on magistritöö autori poolne panus tähistamaks uut vaadet linnapargi taimedele, mis täidavad teatud kriteeriumeid. See termin kui täielik ja kohanev tähistaja väljendab ökoloogilist ja sotsio-kultuurilist väärtust, mis on pargitaimedel linnale ja inimestele.

Analüüsimaaks taimede erinevaid tähendusi inimeste jaoks linnaparkides, kasutati töös kolme erinevat analüüsistruktuuri, mis lahkavad linnapargi taimede semioosi kolmest erinevast vaatepunktist. Igale struktuurile on pühendatud üks peatükk. Esimene peatükk “Biosfäär” arutleb taimede bioloogilise tähenduse üle, mis on inimese ja taime vahelise suhte aluseks. Säilitamise ja muutlikkuse teemad loovad konteksti diskussioonile linnaparkide kui ajaveetmiskohtade üle, mis aitavad kaasa bioloogilisele mitmekesisusele ja loovad ökoloogilist väärtust linnade ja kodanike jaoks. Teine peatükk “Ruumilisus” kirjeldab lähenemisi, mis vaatlevad linnapargi ruumi ja selle inkorporeerimisvõimalusi linnaruumi. Peatükk “Semiootilised kaalutlused” analüüsib semiootiliste mõistete kasutust linnapargi tähenduste kujunemises ja sisaldab ka näiteid erinevatest pargikujundustest, mis soodustavad multimodaalset kogemust.

Neljas peatükk “Taime-kodanikud – uus tähistus” toob ära argumendid selle epiteedi kohasuse kohta ja loetleb taimede tunnused, mis aitavad kaasa nende taime-kodanikuna määratlemisele. Taime-kodanikud on katusmõiste kõikide linnapargi taimede jaoks, tähistamaks nende ökoloogilist, kultuurilist ja sotsipoliitilist tähendust inimestele. Mõistet

võib kasutada erinevate akadeemiliste distsipliinide raamistikus ja ajakirjanduslikes ning sotsiopoliitilistes arutlustes. Töö autori arvates on vajalikud järgnevad empiirilised ja teoreetilised uurimused, et konkretiseerida selle mõiste tänapäevaseid ja edasisi kasutusvõimalusi ja edasiarendusi.

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