# **Representing nature**
# Late twentieth century green infrastructures in Paris

**RENÉ VAN DER VELDE, SASKIA DE WIT**

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# Abstract

The appreciation of green infrastructures as 'nature' by urban communities presents a critical challenge for the green infrastructure concept. While many green infrastructures focus on functional considerations, their refinement as places where concepts of nature are represented and where nature can be experienced and understood, has received little attention in research and praxis. Contemporary urban societies entertain varied and distinctive ideas on nature and their relationship to it, themes explored in contemporary urban park and garden design. These projects can provide insights into the representation, comprehension and experience of nature in green infrastructures. This article expands on contemporary conceptions of nature in urban parks and urban gardens such as those realised in Paris between 1980 and 2000. The projects all display articulated expressions of conceptions of nature, reflecting both a return to the classical garden tradition, as well as elaborations of nature via the sensorial, 'abundant nature' and nature as process. These conceptions can be positioned within the theoretical framework of three forms of nature – first nature (wilderness), second nature (cultural landscape) and third nature (garden). In Paris, contemporary parks and gardens not only express new forms of nature, they also form part of a green infrastructure network in their own right. As a series of precise moments connected by rivers and canals, this network differs markedly from prevailing green infrastructure models. The network of parks and gardens in Paris represents a green infrastructural network made up of a layering of historical and contemporary elements connected in compound ways. The completeness of representations and elaborations of nature – gathered in the three natures – can be dissected and spread out over different constructed landscapes in the city, and it is up to the green infrastructure to unite them.

**KEYWORDS**

green infrastructure; conceptions of nature; three natures; urban gardens; urban parks; sensorial; context; natural processes

## 1. INTRODUCTION

The perception and appreciation of green infrastructures as 'nature' by urban communities presents a critical challenge for the green infrastructure concept. How do users – individuals, groups or collective urban populations – see and value green infrastructures? In his research on the concepts, perceptions and uses of green infrastructure in spatial planning, Ian Mell (2010) found that the perception of green infrastructures is informed by highly diverse factors determined by physical, psychological or social understandings of the environment. He also found that form and composition of landscape was central to positive perceptions, and that this perception was linked firstly to its natural or ecological composition and after that its social meaning. A precise definition of what natural and ecological composition is, was not given in the research. However his conclusions indicate that natural form is a principal driver of the perception and valuing of green infrastructures.

According to psychologists Stephen and Rachel Kaplan (1989) the perception of nature is so important because it provides 'restorative experiences' to recover from the fatigue created by mental effort, coping with hassles, and the everyday demands of living in the modern world. They identified four factors as being particularly important to the achievement of a restorative experience: the feeling of being away, fascination (effortless attention), extent (having both enough scope and enough coherence) and compatibility (in the sense of the environment being compatible with one's abilities and desires); factors which all play a role in wilderness experiences. However they discovered that these factors can be found equally in nearby and 'ordinary' natural environments such as parks and gardens, suggesting them to be equally valuable as places where concepts of nature are represented and can be experienced. Consequently, representations and elaborations of nature in contemporary urban parks and gardens can be used to inform green infrastructure planning and design. These spaces are an important indicator of the way in which nature is interpreted, represented and articulated for urban populations and can provide insights and tools for the development of the representation and experience of nature in green infrastructures.

This form of investigation also has an historical rationale: the first green infrastructures – greenways – developed out of the nineteenth century municipal park tradition. Conceptions of nature were central to this tradition. Moreover, as constructed landscapes, parks and gardens offer important clues as to how urban societies conceive nature and express it through form. Green infrastructures are more than just preserved natural areas within developing regions, they are also invariably built, and cultivated. With a few exceptions, green infrastructures are thus not necessarily or exclusively natural areas but rather an interrelationship between 'nature' and 'culture'. This interrelationship resides principally in design and management regimes, and

thereby embodies and expresses concepts of nature and landscape held by communities and society. The focus on technical or planning aspects in green infrastructures overlooks design and thus the importance of this cultural component. Ignoring this component may lead to a process that urban parks experienced in the course of the twentieth century. The rise of standardisation and normative thinking made its way into the design process and lead to the standardisation of design solutions. The urban park was reduced to either a technocratic element for mass recreation, or a 'bio-cratic' element where nature was left to its own devices and human intervention was taboo (Kegel et al., 1983). As a result the attractiveness of the park declined; the appeal of a ubiquitous 'green' alone proved not enough to sustain its popularity.

The focus for this research is thus on evidencing contemporary conceptions of nature in designed parks and gardens. The projects examined in this paper include four Parisian parks and gardens: Parc de la Villette, Parc André Citroën, Jardin de la Bibliothèque nationale de France and Square des Bouleaux. We will look at how different images of 'nature' can be understood from the perspective of historical and contemporary perceptions and expressions of nature, as a framework for the understanding of the elaboration of nature in the designs themselves. Additionally we will consider the positioning of these new public open spaces within a network concept, with this paper concluding with a brief look at the network of green spaces in Paris in relation to the traditional green infrastructure model.

## 2. CONTEMPORARY INTERPRETATIONS OF GREEN INFRASTRUCTURES

Recent developments in research on green infrastructure have led to a breadth of interpretations of the concept. Early lenses and applications, which grew out of the historical greenways movement and held sway in the 1980s and early 1990s, saw green infrastructure as greenways: corridors of various widths, linked together in a network (Fábos, 1995). Subsequent attempts were made to develop categories of greenways, such as urban-riparian corridors, recreational greenways, ecological corridors, scenic and historic routes and comprehensive networks (Little, 1990). Later interpretations broadened the notion to include not just linear corridors but all manner of physically interconnected 'green' space ranging from nature reserves and urban woodlands to designated cycle routes, channelled rivers and parklands. Despite this broadening of interpretations, there is a common ground between the various understandings of green infrastructure, which can be summarised as a set of sustainability principles. These principles reflect the foci of the range of academic fields involved in green infrastructure. In the field of conservation and ecology, the emphasis is on safeguarding or developing

ecological networks and biodiversity (Benedict & McMahon, 2006). From the perspective of planning and urban development, green infrastructure is seen as a network for the provision and management of water resources, storm water and flood prevention, or as a means to locate alternative infrastructures for commuting. In recreation planning, green infrastructure is envisaged as a spine or framework of recreational facilities with a focus on their accessibility and connectivity for urban populations. Synthesised together, green infrastructure can be described as *"the connective features (physical and metaphorical) linking different environmental elements across the rural and urban landscape, thus providing multi-functional (ecological, economic and social) benefits for diverse populations"* (Mell, 2010).

This multi-functional approach is exemplified by the North Brabant 'Streekplan' (1992), which addresses the landscape and environmental problems created from the conflict between intensive agriculture, nature protection and encroaching urbanisation. The plan segregates developments and nature protection by proposing an ecological network in which nature may exist in a permanent and connected system. In principle it links larger habitat patches with others via a network of corridors, using a target species based approach, and supported by island biogeography and metapopulation theories. At the same time it attempts to integrate water management, cycling and walkways, and recreational facilities within its framework (figure 1).

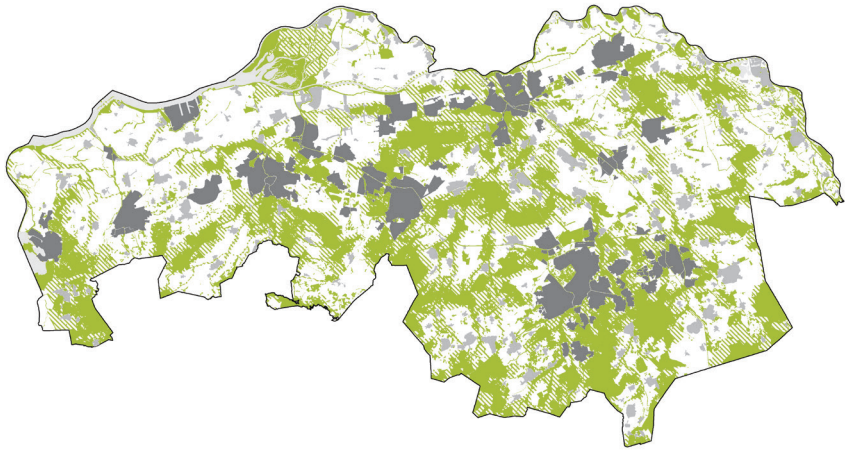

**Figure 1** Functional and ecological approach of green infrastructure: North Brabant Streekplan (source: Structuurvisie Ruimtelijke Ordening, courtesy Provincie Noord-Brabant)

In terms of social benefit to urban communities, research and praxis has focussed on functional aspects such as sport and recreational amenity, and routing for connectivity, accessibility and health. The degree to which green infrastructures offer urban communities spaces that generate and reflect personal and collective notions of nature, has to date received little attention. Central to these goals is the perception of landscape and green spaces by individuals and groups, but despite the extent of research into environmental perception, little work has been done on the perception of green infrastructures.

## 3. THREE NATURES

How might the representation and elaboration of nature in constructed landscapes such as parks and gardens be approached? The classical analysis of 'first, second and third nature' (Hunt, 2000) provides a lens for exploring the conceptions of nature in parks and gardens. This reading of nature stems from the Renaissance, when a conceptual framework for the art of gardens was created for the first time. Yet this thinking is based on a much older text, *De natura deorum*, written in 45 BC, which circulated in many renaissance manuscripts. In this text the Roman writer Cicero distinguished different 'natures.' He described *first nature* – wilderness – as the realm of the gods, untouched by human hands, but also as the raw material for *second nature*: the agrarian landscape, encompassing meadows and ploughed fields, orchards, terraces and rural settlements. This arose out of a process of cultivation enacted on the natural landscape. Cicero wrote *"We sow corn, we plant trees, we fertilise the soil by irrigation, we dam the rivers and direct them where we want. In short, by means of our hands we try to create as it were a second nature within the natural world"* (Cicero, cited in Hunt 2000, p. 33). *Third nature* is the man-made nature of the garden, in which, however conscious or explicit, aspects of both the natural and the cultural landscape are also expressed. This is aptly represented in the diagrammatic drawing used as the frontispiece to the Abbé Pierre le Lorrain de Vallemont's *Curiositez de la Nature et de l'Art (Curiosities of Art and Nature in Husbandry and Gardening)*, a popular book published in Paris in 1705 (figure 2). Here the garden is succeeded by agricultural fields, and the view is terminated with a lumpish hillside from the bottom of which gushes a natural spring. In the other direction – back towards the viewer – the sequence is similar: first the ordered garden, then a grove of regularly planted trees, then the wasteland.

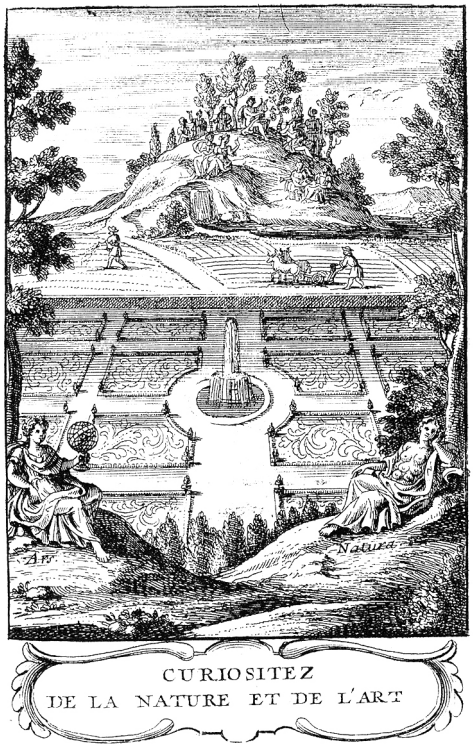


**Figure 2** The three natures of wilderness, agrarian landscape and garden (Frontispiece Abbé de Vallemont, Curiositez de la Nature et de l'Art, 1705, courtesy SUB Göttingen)

The relation between urban parks and gardens and the *three natures* concept becomes explicit in the nineteenth century picturesque park, modelled on the English landscape garden. The presence of – and relationship between – the three natures was claimed as an important characteristic of these gardens. William Gilpin (1724-1804) and William Chambers (1723-1796) indicated three successive types of nature entitled 'pleasing, enchanted and sublime' and used the word 'zoning' to describe their configuration in gardens (Hunt, 2000).

In the transformation of the English landscape garden to the nineteenth-century urban park, these three natures were radically reconfigured within new composition schemes. Steenbergen and Reh unravel this transformation at Birkenhead Park in Liverpool (figure 3).

*"The common zoning of the landscape garden, comprised of the 'garden', the 'meadow' and the 'wilderness', was essentially turned inside out. With their gardens and parterres, the area in front of the crescents and terraces, on the outside of the Park road, was now the 'garden'. The pleasure grounds were comparable to the 'meadow' of the landscape garden, suitable for cricket and archery, then popular*

*sports for the more affluent. The planting along the inside of Park drive screened the open, slightly concave, sun-lit 'meadow' from the denser edge zone. The ponds, with their inaccessible, wild and thickly planted islands, in the centre of the park formed an inwardly focused transformation of the wild nature, the 'wilderness', which had lain on the periphery of the landscape garden."* (Steenbergen & Reh, 2011)

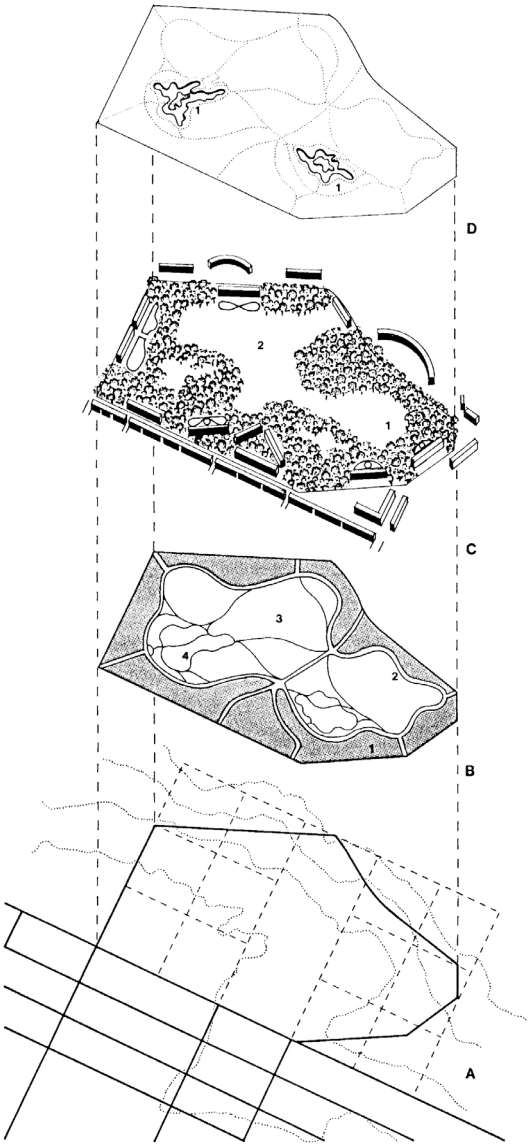


**Figure 3** Three natures in Birkenhead Park (source: Steenbergen & Reh, 2011)

This three natures concept however, is not a consistent theme in park and garden design. Steenbergen and Reh chronicle the dissolution of the *three natures* schema in the functionalist parks of the twentieth century. They argue that the three natures of the nineteenth-century park scheme became isolated into separate elements of the functionalist city. *"The 'wilderness' was moved to the botanical garden, the 'meadow' became a rectangular, multifunctional playing field, and the 'garden' took on the guise of a recreational facility"* (Steenbergen & Reh, 2011). These developments can be said to adequately reflect developing conceptions of nature in urban societies in this period. Towards the end of the twentieth century however, a new generation of urban parks and gardens emerged in which the elaboration of nature returned as a guiding theme. This paper asks: how has the three natures theory fared in these projects?

## 4. REPRESENTATION AND ELABORATION OF NATURE IN CONTEMPORARY URBAN PARKS AND GARDENS

It is possible to examine the developments in Paris in the period from 1980 to 2000 as a case study as this period witnessed the designation and construction of an extensive series of new public open spaces in and around the inner city. These developments, together with parallel events in Barcelona and the Netherlands, are considered the beginning of a new period of landscape design innovation embodying emerging societal visions of nature and landscape (De Zeeuw, 1991). The dissolution and separation of the three natures in the functionalist period was contributory to the condition urban parks had reached in the lead-up to the period of construction in Paris between 1980 and 2000. The brief for Parc de la Villette for instance, went to lengths to lament this condition. *"[...] it can be argued that the 'green' of the city has been transformed into a mere accompaniment to the buildings: a planted décor, often without any imaginative power, which evokes not the slightest emotion nor stimulates any activities, in short, provides not the slightest pleasure"* (Etablissement Public du Parc de la Villette, 1982). The briefing documents thus actively promoted a return to the imaginative conceptions of nature embodied in historical examples. The reversal of this pattern in Parisian parks indicates an important shift in the envisioning of nature by contemporary designers, reflecting in turn shifts in conceptions of nature held by urban communities.

The establishment of the Atelier Parisien d'urbanisme (APUR) in 1974, was central to developments in Paris in this period, replacing modernist planning dogmas with a new urban architecture paradigm and the return of centralist thinking (Uyttenhove, 1991). Parks and gardens featured prominently in the APUR's vision, describing, among other things, their importance as creative gestures to reconnect contemporary urban societies to their public open spaces. A review of public open spaces of the city of Paris drawn up by the APUR in 1981 criticised the technocratic nature of green space and

the lack of identifiable, culturally relevant urban parks and gardens (Atelier parisien d'urbanisme, 1981). In the report, the APUR proposed the creation of three new urban parks in derelict industrial sites on the edges of the city: Parc de La Villette, Parc André Citroën and Parc de Bercy, as well as a number of other public space initiatives (figure 4).

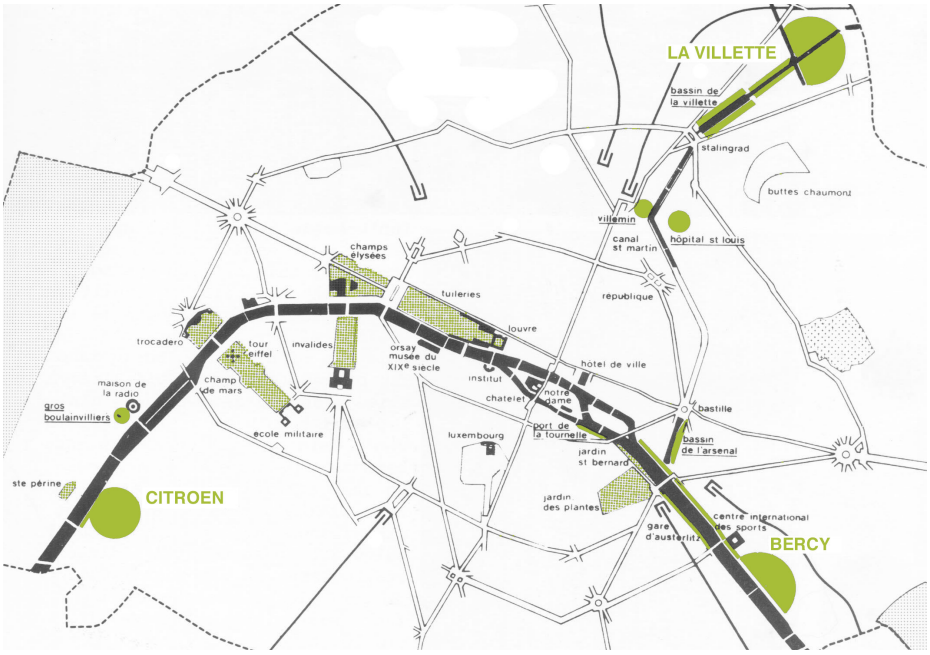


**Figure 4** Proposed green space locations along the Seine and its canals (source: Atelier parisien d'urbanisme, 1981)

This thinking demonstrated the APUR's intention to not only revive the connection between parks and gardens and urban populations, but also to situate them within an interconnected network together with existing facilities in the city.[1]

A study of Parc de la Villette, Parc André Citroën, Jardin de la Biblithèque nationale de France and Square des Bouleaux exposes a range of different representations of nature.

### 4.1 Classical interpretations of nature

Two of the parks use representations of nature from the classical garden traditions. At Parc André Citroën a matrix of rectilinear forms determine the geometry of the park and its spatial composition. Moreover, this park is carefully partitioned into different spaces or 'rooms' detailed in varying forms of

naturalness, echoing the formal French classical gardens in which nature was dissected into formal categories such as the parterre, *tapis vert* and woodlands (Steenbergen & Reh, 2003) (figure 5).

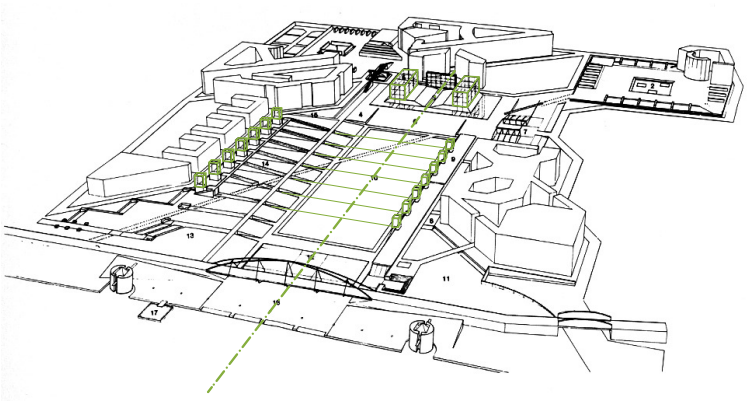

**Figure 5** Formal representation of nature in Parc André Citroën.

At Parc de la Villette, the nodal geometry of the *folie* grid can be seen as a similar interpretation of nature from the classical garden tradition, in this case an abstraction of nature via numbers, dimensions and ordering developed in renaissance thought and artistry (figure 6). [2]

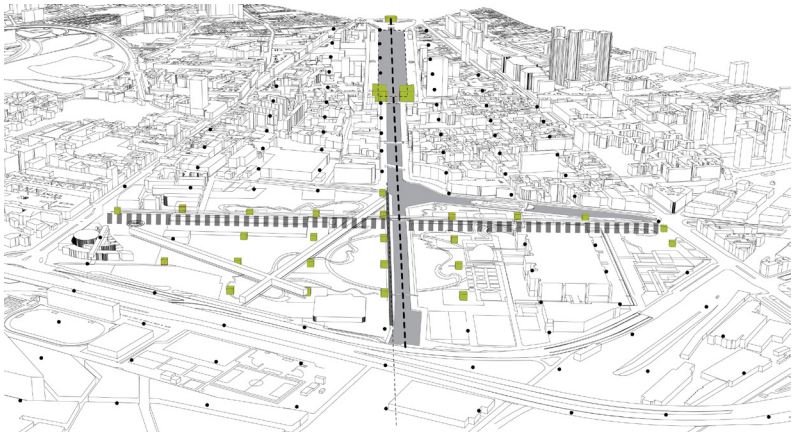

**Figure 6** Rational representation of nature in Parc de la Villette (numbers, dimensions and ordering) (illustration: René van der Velde)

This conception of nature is also evident in the figures of the Prairie du Circle and the Prairie du Triangle, two fields of similar size, forming together with the rectangular footprint of the Cité des Sciences an enormous diagram of elementary geometric forms.

Distinctive for Parc de la Villette is its additional incorporation of an Arcadian conception of nature in the composition. The curvilinear figure of a garden walk distinctly references the lines of nineteenth-century strolling parks such as Parc des Buttes-Chaumont nearby; a fact various commentators have independently (and wryly) commented on (Baljon, 1992; Meyer, 1991). The sweeping curves and parabolas are no spontaneously evolved hillside pathway, but rather a wilful design act resembling the lines of a picturesque park (figure 7).

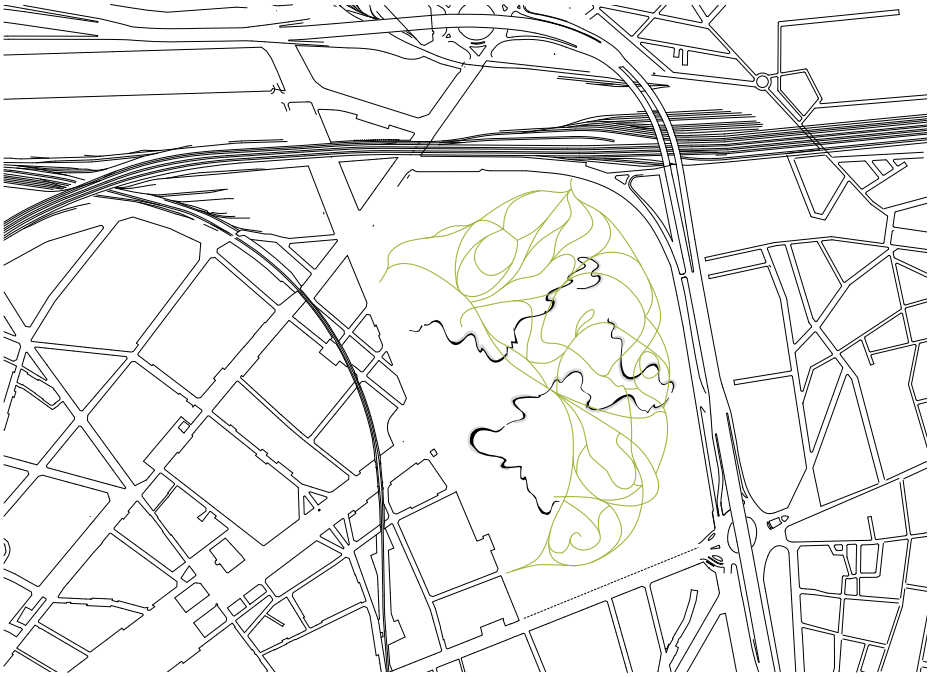

**Figure 7** Picturesque representation of nature in Parc de la Villette. Overlay of the figure ground Parc des Buttes-Chaumont over Parc de la Villette (illustration: René van der Velde)

## 4.2 Emblems of nature

Metaphor and symbol used in the classical garden tradition also figure prominently in the representation of nature in these parks. The gardens in the Parc de la Villette evoke images of exotic or native landscapes, as for example the *bosco* of bamboo in the Jardin des bamboos evoking a primeval forest, or

the vines and climbing plants in the Jardin de la treille, referencing orchards or allotment gardens. Similarly, the gardens at Parc André Citroën symbolise the rich tradition of horticulture in France through elaborate planting designs and symbolic references.

This use of metaphor and symbols depicting nature had not been seen in urban parks for much of the twentieth century. In contrast to their use in nineteenth-century parks, twentieth-century parks were characterised by an increasing absence of expressive form. Planting design in parks for instance, changed dramatically. Whereas in the nineteenth-century park, planting had an independent role in the design, arising out of horticultural traditions and embodying pantheistic ideals about nature, it became progressively marginalised in park design, serving only to demarcate and organise park functions, or sometimes to simulate botanic communities for ecological purposes (De Jong & Dominicus-Van Soest, 1999).



### 4.3 The sensorial

Conceptions of nature in these parks however, go further than can be clarified through the lens of abstractions of nature from the classical design tradition. While the emphasis used to be on visual experience, in contemporary parks and especially gardens, multi-sensory perception dominates. In 1929 Johannes Granö defined two realms of perception, the *Fernsicht* and the *Nahsicht*. According to Granö, *Nahsicht* is the environment we can experience with all our senses; *Fernsicht* is the part of our environment we mainly experience by vision: the landscape, determined by the horizon (Granö, 1929). The relationship between distance and sensory information is relative to the reach of each different element of sensory information. In open space, sounds do not carry as far as light, and smell has an even narrower scope. Taste and touch can only be experienced upon direct bodily contact. Because weight, pressure, and resistance are part of our habitual body experience, we unconsciously identify with these characteristics in the forms we see. Proximity makes one attentive to the material reality of earth, plants and water, such as mass, grain, fragility, suppleness or fragility.

In Parc André Citroën, a large part of the park is taken up by a series of thematic gardens based on the sensorial aspects of nature. The edge of the park is divided into small, enclosed gardens, where colour, scent, sound and haptic stimuli are amply used, generating intense sensorial experiences. The individual relationship of the visitor with the gardens alters with each garden, one being viewed from a balcony, another from a path, and a third from a self-contained space seen from the inside. Different slopes and material underfoot address the sense of body balance, and plants have various textures and scents (figure 8).

**Figure 8** Sensorial aspects of nature: tactile sensation in the Orange Garden, Parc André Citroën

Similarly in Parc de la Villette the gardens lining the garden walk represent the introduction of nature in the park via sensory qualities of nature. The mysterious grove of spruce and birch in the Jardin des frayeurs enfantines (Childhood fears garden) is accompanied by sinister music. And as its name implies, the Jardin des ombres (Shadow garden) plays a skilful game with light and shadow, while the ninety fountains in the Jardin de la treille (Trellised garden) are a visual and audible sensation of water (figure 9).

**Figure 9** Sensorial aspects of nature: visual and audible sensation of water in the Jardin de la treille, Parc de la Villette

The most elaborate expression of a sensory garden in the Parc de la Villette, however, is the Jardin des bambous. Its designer Alexander Chemetoff lowered the garden into the ground to literally escape Tschumi's sequential imagery concept devised for the gardens (Aben & De Wit, 1999). More importantly, lowering the garden into the ground not only allows it to escape from the fleeting experience of sequential (visual) images above, but also creates an enclosure in which sensorial perception can be developed. When descending, the sound of cascades that accompany the monumental staircase gradually drowns out that of the outside world. The stairs lead to a circular room with high stucco walls, a break in between the active world of the park and the relaxation of the garden, with artificial frog sounds aurally enlarging the distance between the urban sounds of the park and the natural sounds of the garden. A narrow path on a steel grid under which one can hear (but not see) the water flowing, leads the visitor through the dense bamboo foliage while ducking under the sewer pipes running through the garden. It is warmer and more humid than above ground and the sound of flowing and rippling water is everywhere. There is so much bamboo that one cannot see the boundaries of the garden, an exotic wood that seems to go on forever. The Jardin des bambous presents itself as one of the visual images in the park: an abundance of bamboo, while the details remain hidden. Within the garden, however, there is no overview, and auditory and haptic stimuli complement the visual, with emphasis on the earthly aspects (figure 10). So it is within the scope of this garden that multisensory integration of nature is brought into play.

**Figure 10** Jardin des Bambous (Parc de la Villette) exemplifies the multisensory experience, evoked by proximity in an enclosed space (illustration: Saskia de Wit)

### 4.4 The material presence of nature: abundance

The physical presence of nature was further elaborated in other projects of this period in Paris with the construction of the Jardin de la Bibliothèque nationale de France (National Library garden), designed by Dominique Perrault and completed in 1989. The library buildings were assembled around a large central garden, located in a sequence of large urban voids along the river Seine including Place de la Concorde, Champs de Mars, Invalides, and Parc de Bercy. In the garden everything is subordinate to the dominating image of a primordial forest. 250 mature Scots pines, birches, and oaks are planted in a carpet of heather and ferns. This image is achieved by transplanting a complete fragment of the Fôret de Bord in Normandy. The garden is sunk into a raised podium, from where escalators descend halfway into the garden. Here a platform, like a balcony overlooking the garden, allows for access to the library. From the lower level inside the building, the trees obscure the view to the facades, making the garden appear as part of an unbounded landscape space. The visitor, however, remains outside the garden, separated by a glass facade. The inaccessibility of the garden proper enhances the effect of wilderness, nature untouched by man (figure 11).

**Figure 11** Abundance of nature in the Jardin de la Bibliothèque nationale de France

A similar iteration of nature can be found in the Square des Bouleaux, the central garden for a housing complex in the city centre designed by Michel Desvigne, constructed between 1989 and 1992. In the isolated space, a 'living' environment is introduced – rich, coherent and spectacular. The form

is entirely blurred for the benefit of the richness of its materials and texture. The birch forest represents an intensified version of nature, suggesting a primordial nature that has always existed on this location. It is a potent image: nature transposed to the urbanised context, with natural nature replaced by artificial nature, mimicking the natural processes. Nature is represented as a creative force for the city. It is the continuous change of natural growth that determines the design, not the design as a final product, as a *fait accompli* (figure 12).



**Figure 12** Abundance of nature in the Square des Bouleaux

### 4.5 Nature as process

The elaboration of nature as process evident at the Square de Bouleaux can also be seen in specific parts of Parc André Citroën. Gilles Clément, one of the designers of the park, envisaged the park design chiefly as the *"dynamic management of spontaneous vegetation rather than a static visual order"* (Garcias, 1993). This radical vision was somewhat compromised in the realised park. Alain Provost, another designer involved in the design, stated that the scheme was intended to create a maximum number of natural elements and to merit its title of 'park' by being *"strong, wise, generous and poetic…based on the strong and indispensible presence of water, the controlled dynamism of the earth and the rhythm of vegetation"* (Provost, 1991). The realisation of Clément's vision for the dynamism of nature was brought back to his design for the Jardin en Mouvement, a constantly changing landscape responding to abiotic, biotic and environmental processes, with a minimum of intervention or regulation

(figure 13). This garden lies at the edge of the park, next to the river, following the principle of a progression from natural (the river) to artificial (the city). In the garden the paths shift each year, adapting to a spontaneous spread of seeds, causing a continuous modification of circulation and vegetation.

**Figure 13** Experiencing the natural processes in the Jardin en Mouvement, Parc André Citroën

## 5. DISCUSSION: THREE NATURES IN CONTEMPORARY PARISIAN PARKS AND GARDENS

We opened the paper with an introduction to conceptions of nature in urban parks and gardens through the classical analysis of 'first, second and third nature'. How then does this view relate to our findings in the Parisian parks and gardens?

### 5.1 First nature

From the research, we can conclude that at Parc de la Villette, *first nature* is not intentionally articulated, while at Parc André Citroën a wilderness of sorts can be seen in the Jardin en Mouvement (Garden in Movement). This garden is conceived as a dynamic system of planting subject to the whims of nature and only occasionally interfered with by gardeners (Clément, 1995). The representation of first nature (wilderness) as a sacred, undisturbed entity is also embodied in the Jardin de la Bibliothèque nationale de France.

These last two examples reflect an emerging pattern of envisioning of nature with natural processes, and the representation of a nature in which humans are (literally) excluded. The conception of nature as wilderness via notions of process and 'abundance' developed rapidly in park design discourse subsequent to these projects. Understanding and articulating natural processes now forms the dominant theme of many contemporary park projects (Berrizbeitia, 2007; Pollak, 2007).

### 5.2 Second nature

The articulation of *second nature* of the agrarian landscape can be evidenced in the multifunctional lawns of the Prairies du Triangle and du Circle at Parc de la Villette and in the more architectonically articulated grassy planes of Parc André Citroën. The question remains as to whether these elements can be motivated as a representation of *second nature* or whether they are merely a continuation of the functionalist dogma of the *Volkspark* based on sociological principles. If however, as argued by Hunt, the historical extrapolation of *second nature* revolved around nature as a useful, productive landscape, then the vision for the lawns in these parks as a tableau for a diversity of activities and uses may still be seen as correlating to *second nature*. Additionally, the thematic emerging at Parc André Citroën in which many agrarian plants and techniques from the French horticultural tradition are used clearly embodies the idea of *second nature*.

### 5.3 Third nature

The articulation of *third nature* – that of the garden – finds its expression in a range of features in the Parisian projects. By referencing the main composition element of the nineteenth-century strolling park, the garden walk at Parc de la Villette is a clear iteration of *third nature* sourced from historical examples. More unequivocally, *third nature* is exemplified by the series of gardens realised in both Parc de la Villette and Parc André Citroën. In contrast to *first nature* and *second nature*, the critical characteristic of *third nature*, is that nature is brought into the realm of human perception. In historical examples such as Parc de Buttes Chaumont and Birkenhead Park, this was translated in the composition through the emphasis on the routing as a sequence of visual and spatial experiences. However, in the gardens in Parc de la Villette and Parc André Citroën a new aspect of human perception comes to the fore: multi-sensory perception. Sensory conditions are emphasised as attributes of the design to structure, serve and enhance perceptual awareness of nature.

## 6. PARISIAN PARKS AND GARDENS AS COMPONENTS OF GREEN INFRASTRUCTURE

The positioning of many of these new public open spaces within a network structure is of relevance to this paper (see figure 4). Despite its dense urban fabric, the city of Paris boasts more than 400 parks and gardens, configured within a network of green space which has developed over many centuries. From the sixteenth century onwards, chateaus had been built along the river Seine. In the seventeenth century the chateaus were enlarged and reorganised, dominated by the creation of spatial axes, connecting the gardens into an all-embracing system. When incorporated in the urban fabric, these gardens were transformed into urban parks, organised around the river as a backbone, and connected by avenues. Thus the basis was laid for the landscape identity of Paris in the seventeenth century, formalised in the system of avenues, gardens and parks. In the nineteenth century a new network was superimposed on this system, made up of urban avenues, promenades and boulevards, linked to a system of parks, public gardens, and green squares, and incorporating former hunting forests. The Seine – extended with the canals St. Martin, Bassin de l'Arsenal and Bassin de la Villette – remained the backbone of the system but the axial system faded away, replaced by a network of overlaps and confrontations between the seventeenth-century formal network and the contemporary urban network. The parks and gardens realised between 1980 and 2000 form part of this growing network of interconnected public open spaces.

The origins of Parc de la Villette and Parc André Citroën, as brownfield parks projected onto derelict industrial sites, was also repeated on a larger scale. With the canals losing their industrial function in the twentieth century, they were transformed into the threads of this extended green infrastructure. These new facilities each express nature in different ways, which, when viewed as a collection, address the range of three natures. The value of this green network in the city of Paris is not so much their interconnectedness, but the multiplicity of conceptions of nature they offer (figure 14).

**Figure 14** The formal network and urban green spaces of Paris (source: Steenbergen & Reh, 2011)

## 7. CONCLUSIONS

### 7.1 A catalogue of conceptions of nature

A first conclusion we can draw is that in these projects nature is represented and articulated using abstract conceptions of nature from the classical garden tradition, evidenced in historic parks and gardens such as Birkenhead. Also derived from the classical tradition is the use of metaphors of nature. At the same time we can conclude that the nature is also articulated using elements dissimilar to historical precedents, such as the sensorial, abundance and natural processes, which can give an insight into conceptions of nature entertained by contemporary societies. In addition, we can draw from this brief overview that, unlike historical examples such as Birkenhead Park, *first, second* and *third nature* are not present in equal measure in the examples. In some, one of the three is lacking altogether; in others the emphasis is on

one, at the cost of the others. *Third nature*, when understood as the domain of nature relating to human perception, is the most prolific and articulated conception found in the examples, giving room for both classical and new conceptions of nature. This indicates a broader development of visions and articulations of nature in parks and gardens.

Contemporary conceptions of nature seen in these examples are diverse and rich. The application of these insights for the development of green infrastructures lies in their explication of conceptions of nature envisaged for urban communities. Although green infrastructure elements consist of more than parks and gardens, they are strongly related to them and as such can be expected to be subject to similar terms of reception and valuing.

A critical aspect of the research is the reception and valuing of these examples by urban communities. To what extent the presumed representation of conceptions of nature put forward by designers correlates to how people receive and value these spaces is an important question for further research. In addition, cultural differences obviously influence conceptions of nature and have had a clear effect on these projects. The articulation of the conceptions of nature in situations outside France deserves further attention.

### 7.2 The network of parks and gardens in Paris as a green infrastructure

The form of the network is also an important question, with the Paris network making an interesting case study. The network of parks and gardens in Paris represents a green infrastructural network made up of a layering of historical and contemporary elements connected in compound ways, but not necessarily always physically connected. This network deserves further study but does show that green systems are also valid even in high-density historic city cores such as Paris. The parks and gardens in Paris are an example of an architectural interpretation of a network that permeates the whole city. The different conceptions of nature from the classical design tradition not only determined the form of the parks, but also the way they were connected and interrelated within the urban system. The new parks and gardens of the late twentieth century each had a different focus, which, when viewed as a collection, address a range of conceptions of nature. The value of this green network in the city of Paris is an array of interpretations and representations of nature, all derived from human perception and use, and thus can be appreciated in different ways by urban communities. Where in the nineteenth-century parks the triangle of three natures determined the unity of the park, this does not need to be the case. From the Parisian case study we can see that the completeness of representations and elaborations of nature – gathered in the three natures – can be dissected and spread out over different constructed landscapes in the city, and it is the green infrastructure as a whole, which unites them.

## ENDNOTES

1 For each of the three parks design competitions were drawn up by the APUR. Eventually Parc de La Villette was designed by Bernard Tschumi and built between 1984 and 1992. For the Parc André Citroën the two winning teams joined forces into a team consisting of the architects Patrick Berger, Jean Paul Viguier, Jean Francois Jodry, and landscape architects Gilles Clément and Alain Provost. The park was executed between 1986 and 1998. Parc de Bercy (which we will not elaborate on further in this paper) is made up of three gardens designed by architects Bernard Huet, Madeleine Ferrand, Jean-Pierre Feugas, Bernard Leroy, and by landscape architects Ian le Caisne and Philippe Raguin between 1993 and 1997.

2 Interpretations of nature through geometry first emerged in the Renaissance; whereas western medieval interpretations of nature viewed the terrestrial world as chaotic and exemplary of the fall of man, renaissance thinkers looked on the chaos of terrestrial nature as another form of divine order, albeit well concealed. In unravelling this divine order, they turned to classical thinking of Plato to understand and imitate nature via mathematics, expressed in the axiom 'Natura artis magistra est' and leading to the development of an ideal system of proportions, dimensions and ratios derived from nature. This system also had as its basis the human figure, which was perceived as the vessel of divine order in that it was created in 'the image of God'. In architecture, the proportions of the human body, articulated in Vitruvius's *De Architectura* (25-23 BC) were thus interpreted as diagrammatic of a cosmic nature, a metric diagram of the hidden order of nature.

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