BRIDGES OVER TROUBLED WATERS

Marleen Wynants &
Goedele Nuyttens (eds.)
FOREWORD BY RICCARDO PETRELLA

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BRUSSELS

City of tributary valleys

BAS SMETS

The territory of Belgium is one of the most densely populated in Europe. The area between the urban centers is characterized by scattered development with a virtually constant density. The absence of any strong landscape features reinforces this state of extensive and sparse urbanity. However, although largely unseen, an extensive network of smaller rivers organizes this territory. Through a series of research projects, Bureau Bas Smets explores the opportunity to reinforce these rivers and their valleys to anchor existing and new development.

From the Eurodelta and the different hydrographic conditions of the lowlands of Flanders and Holland, this article zooms in on the particular tributary river system of the Zenne to reveal a new way of seeing Brussels. The city's green spaces are connected to the underlying tributary system and can be perceived both as a continuous park and a solution to flooding problems. This is perfectly illustrated in the concluding and specific case of the Molenbeek, one of the tributaries of the Zenne River.

Eurodelta

The lowlands of Flanders and Holland are similar in their lack of geographic relief. Yet, their hydrographic conditions are very different. The main rivers of the Eurodelta reach the sea in Holland. At the coastal line, they create the extensive Rhine-Meuse delta, one of the largest river deltas in Western Europe. The rivers running through northern Belgium are of a totally different nature, both in length and in source elevation. The rivers Lys, Dender, Zenne and Dyle are all about 100km long and their sources lie about 100m

above sea level, compared to a length of 1233km and a source elevation of 2345m for the Rhine. These rivers do not carry the water from a glacier to an ocean, but mainly drain a flat terrain. The flatness of the landscape has indeed created a specific hydrographic condition.

Lying at an equal distance from each other, the rivers Lys, Scheldt, Dender, Zenne and Dyle form a system of parallel valleys running from south to north. Smaller tributary waterways flow into these rivers creating a truly capillary hydrography. The urbanization of the Eurodelta is a direct response to its hydrography. The difference between the hydrographic conditions in the Netherlands and Belgium has resulted in very different urbanization typologies. In the Netherlands, urbanization has been conceived based on the holding back of water with dikes and polders. This has resulted in a man-made environment composed of a network of compact cities. The actual problem of rising water levels is treated within this centuries old tradition of a negotiation between water and land.

The built-up zone in Flanders is very distinctive: the areas between urban centers are characterized by scattered development with a virtually constant density. On a European scale, the layout of Flanders is unmistakable. Its scattered development shows up as a grey stain that stands out from the surrounding territory. The absence of any strong landscape features reinforces this state of extensive and sparse urbanity. With neither France's natural nor the Netherlands' man-made landscape, the Belgian landscape has little to offer in way of resistance to development pressure.[1]

Nevertheless, most of the cities in northern Belgium have originated along its parallel river system. Each of these waterways is rather small and does not have the capacity to structure the surrounding landscape. But the entire hydrographic system with its rivers, tributary rivers and capillary rivers could be conceived as one single landscape structure.

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1 Smets, Bas, 'In search of landscape structures for the urban sprawl around Leuven', in: Nancy Meijsmans (ed.), Designing a Region, SUN Publishers, Amsterdam, 2010, pp 54-61.

Figure 1- Hydrography and urbanization of the Eurodelta. © Bureau Bas Smets

Zenne valley

On the scale of Belgium, a number of parallel rivers drain water into the North Sea via the Scheldt. All these rivers flow from south to north at a regular distance of about 20km between any two waterways. The main cities lie along these parallel rivers.

Each of these rivers is characterized by a number of tributary rivers, themselves equidistant one from another. The result is a capillary hydrography that resembles a system of micro fissures draining a flat landscape.

The urbanization of smaller cities seems to have followed this ramification. The more a waterway has secondary branches, the more settlements can be found. The urban sprawl, which appears to be independent of any geomorphologic organization, follows the hidden logic of the tributary river system.

Reinforcing the capillary hydrographic structure would generate a landscape structure capable of anchoring the urban sprawl in its territory. Each of the parallel valleys could become a linear hydrographic park system. This would create a strong landscape identity for this flat territory. Simultaneously, the problem of rising water levels could be treated through this extensive hydrographic system.

The valley of the Zenne has its source in Sognois and is an indirect tributary river of the Scheldt through the rivers Dyle and Rupel. Brussels was established in the middle of the Zenne valley. However, in the 19th century, the highly polluted Zenne River was covered up and Brussels lost its main waterway

A thorough reading of the existing urban space reveals that all the major infrastructural elements have taken the valley and its topography into account. Railroad tracks are strictly parallel to the contour lines. The canal lies at the center of the valley and the city's main boulevards are either parallel or perpendicular to the contour lines. Brussels' main waterway may be invisible, yet the valley of the Zenne is very present through its parallel infrastructure.

By covering up the Zenne River, trees have also disappeared. However, a number of catchment basins flow into the Zenne, and although the river runs underground, its tributaries are still visible. These catchment basins with their tributary river (or 'beek' in Dutch) are also the origin of many settlements, such as Molenbeek, Etterbeek, and Schaarbeek.

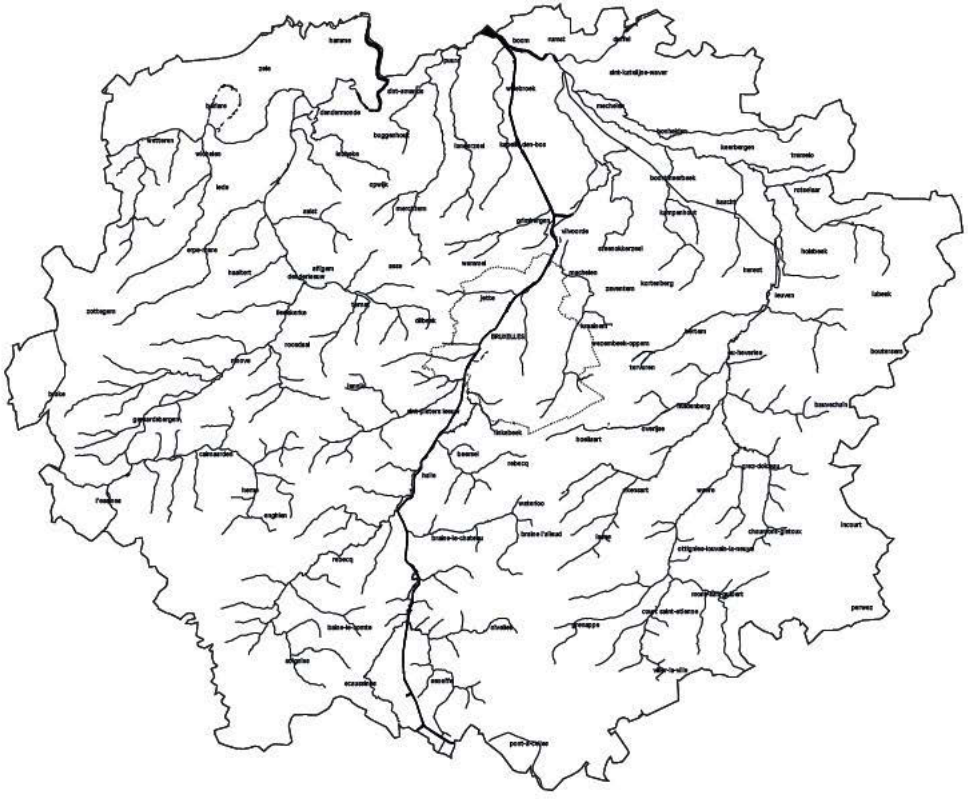

Figure 2 - The capillary hydrography of the parallel river system. © Bureau Bas Smets

Brussels

The parks and green spaces of Brussels seem fragmented and dispersed throughout the territory. When superposed with the system of tributary rivers, a whole new structure is revealed. Almost all of the city's parks and green spaces are indeed connected to these secondary waterways.

This image invites a new way of seeing Brussels. Instead of a main river flowing unseen through the valley, an image of parallel tributary valleys becomes apparent. Suddenly, the abbey of La Cambre is connected to Leopold Park, to Ambiorix Square and even Josaphat Park. The shared element connecting all of these spaces is the Maalbeek tributary. This system is already visible in the Woluwe valley, where the tributary waterway is accompanied by a large number of plantations, parks and green spaces.

Whereas it seems common sense to try to reestablish the Zenne River as the backbone of the city, this new image suggests a radically different approach. Brussels does not have a central river like Paris and London. Brussels, the capital of Europe, deserves its proper landscape structure. The ensemble of catchment basins with their tributary rivers could become the defining image of Brussels, and a shared image for all 19 municipalities. Furthermore, this image coincides with existing green structures. Brussels would thus acquire a landscape structure composed of a number of autonomous entities, corresponding with the different municipalities and their catchment basins.

Frederik Law Olmsted, the celebrated American landscape architect known for the design of Central Park in New York City, developed the principle of park systems. By connecting existing green elements, he created one single landscape structure in a number of American cities. For the city of Minneapolis, he conceived a park system by connecting the existing lakes around the city center to form one continuous green space. This allowed for larger-scale recreation, but it also created a hydrologic system capable of retaining rainwater in case of heavy precipitation. Designed in the 19th century around a dense city center, today this 'Lake Necklace' as he called it, lies amidst an endless urban

sprawl. This park system is flooded in times of heavy rainfall and remains a simple but intelligent solution to the water problems of Minneapolis.

Brussels has a real problem with flooding. At the VUB, Earth System Science has been studying this problem over the last few years. In close collaboration with them, Bureau Bas Smets has conceived a park system for Brussels, not only to create a continuous green space but also to solve the flooding problem.

Each catchment basin offers the opportunity to conceive a linear park system. Since each catchment basin serves as an independent entity, this strategy allows phasing on a long-term basis.

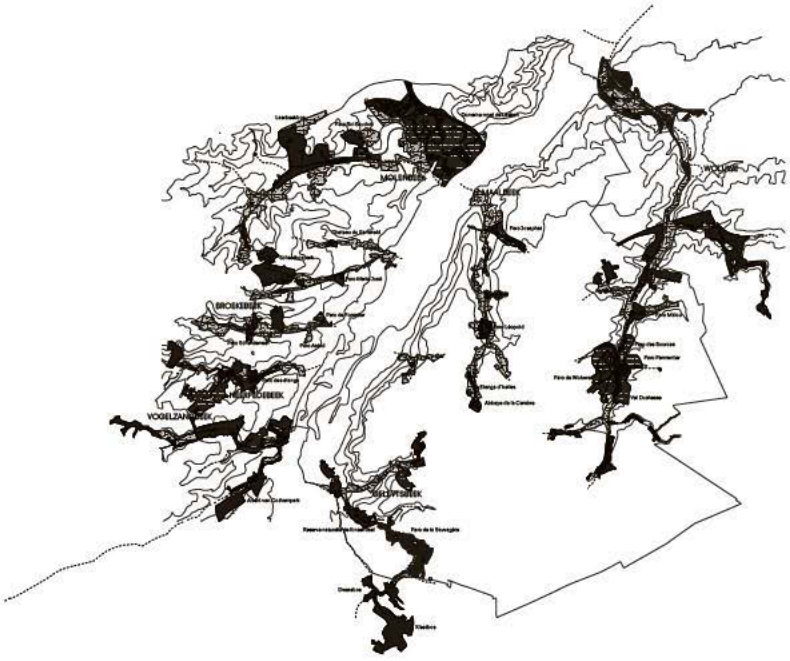

Figure 3 - Park system through a hydrographic identity. © Bureau Bas Smets

Molenbeek

The Molenbeek is one of the eight Zenne tributary rivers and serves as an exemplary case study. The Molenbeek crosses different types of spaces, from built space to agricultural fields and highway infrastructure. There are a number of autonomous parks connected to the Molenbeek. Nowadays, they are not frequently visited because they seem too isolated. Connecting them through a park system would greatly enhance their accessibility and attractiveness.
There are also a number of industrial and agricultural zones along the Molenbeek. The industrial zones could be transformed into landscape features while the fields could reinforce the park system. The result is a park system, made up of parks, greens zones, agricultural fields and industrial zones. This park system proposes a continuous open space, easily accessible from all adjacent urban zones.

Just like Central Park in New York City or Hyde Park in London, Molenbeek could become the linear park of northwest Brussels. The joint study with the VUB team revealed that all flooding problems occur at the point where the tributary river flows into the main river. This is caused by ongoing urbanization, combined with the mineralization of un-built space. Three solutions present themselves:

Firstly, the capacity to absorb water on the plateau must be enhanced. This can be achieved through a number of perforations of the mineral surface. The green spaces on the Molenbeek plateau can help infiltrate the rainwater.

Secondly, the speed of water flowing down the slopes of the hillside should be reduced. The alignment of trees on the boulevards could guarantee this flowing speed reduction.

Thirdly, the capacity to stock water in the valley must be augmented. This can be achieved by adding wet zones to the valley park system.

These three actions would reduce the flooding problem and at the same time create a specific landscape structure that could be used for every tributary valley.

Figure 4 - Eight catchment basins as eight park systems © Bureau Bas Smets

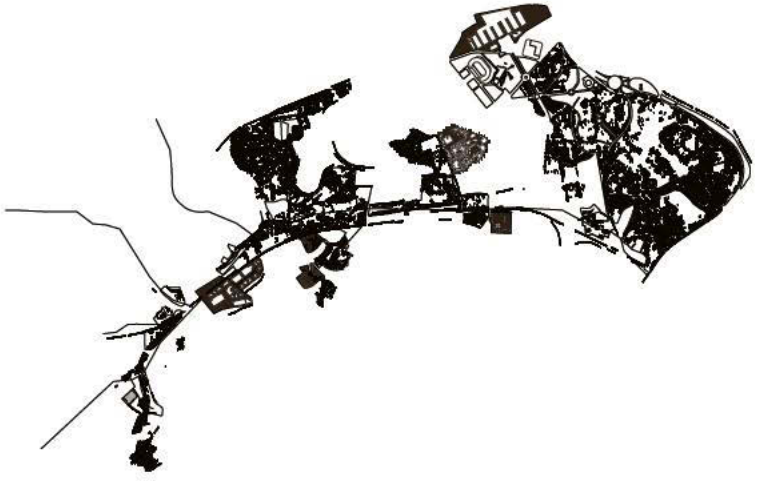

Figure 5 - Molenbeek as a park system. © Bureau Bas Smets

BIO

BAS SMETS specializes in the conception of landscape strategies and the realization of public spaces. His agency is currently working on 50 projects in 10 countries. These projects include the creation of a new Public Park for the Estonian National Museum designed by DGT architects, the refurbishment of Ingelmunster city center, and the building of a 10-hectare park housing 30 towers designed by New York architects REX in Songdo, South Korea. Bas Smets was selected as the landscape architect for the 'Parc des Ateliers' in Arles, in collaboration with Frank Gehry, who will build a new international center dedicated to images and photography. Bas Smets obtained a masters in Architecture and Civil Engineering at the University of Louvain, as well as postgraduate qualification in Landscape Architecture from the University of Geneva. He was awarded the French prize for young architects, Nouveaux Albums des Jeunes Architectes et des Paysagistes 2007-2008. Bas Smets teaches on public space at the Ecole Spéciale d'Architecture in Paris and the La Cambre School of Architecture in Brussels.