THE SHAPE OF THE LAND

TOPOGRAPHY & LANDSCAPE ARCHITECTURE

EDITED BY MARC TREIB

ORO EDITIONS, NOVATO, CALIFORNIA

Publication of this book was supported by generous grants from
the Hubbard Educational Foundation and the Richard and Rhoda Goldman
Distinguished Professorship, University of California, Berkeley.

Book Design: Marc Treib
ORO Project Coordinator: Jake Anderson
Proofreader: Alicia Moreira

First Edition
Library of Congress data available upon request.
ISBN: 978-1-957183-24-4

International Distribution: www.oroeditions.com/distribution
10 9 8 7 6 5 4 3 2 1
First edition

World Rights: Available

Color Separations and Printing: ORO Group Ltd.
Printed in China

CONTENTS

Preface *8*

1. Reforming Terrain *10*
Marc Treib

2. Repton for Real: The Practical and Pictorial *32*
Stephen Daniels

3. The Art of Landmaking *50*
Adriaan Geuze

4. The Starting Ground *70*
Bas Smets

5. Scaled Down *92*
Jennifer Guthrie

6. Unleveling the Land, On Sand and Lava *108*
Karl Kullmann

7. Ten Topographic Acts *126*
Marc Treib

8. Moving the Earth,
Stirring the Soul *148*
David Meyer

9. Trash Topography:
Shaping Postindustrial Land *168*
Elissa Rosenberg

10. Topography as Expressive Form *188*
Ana Kučan

11. The Washington Monument
Topographically Considered *208*
Kathleen John-Alder

12. To Act or Not to Act *228*
Georges Descombes

13. Renewal and Topophilia:
Toronto's Port Lands *246*
Laura Solano

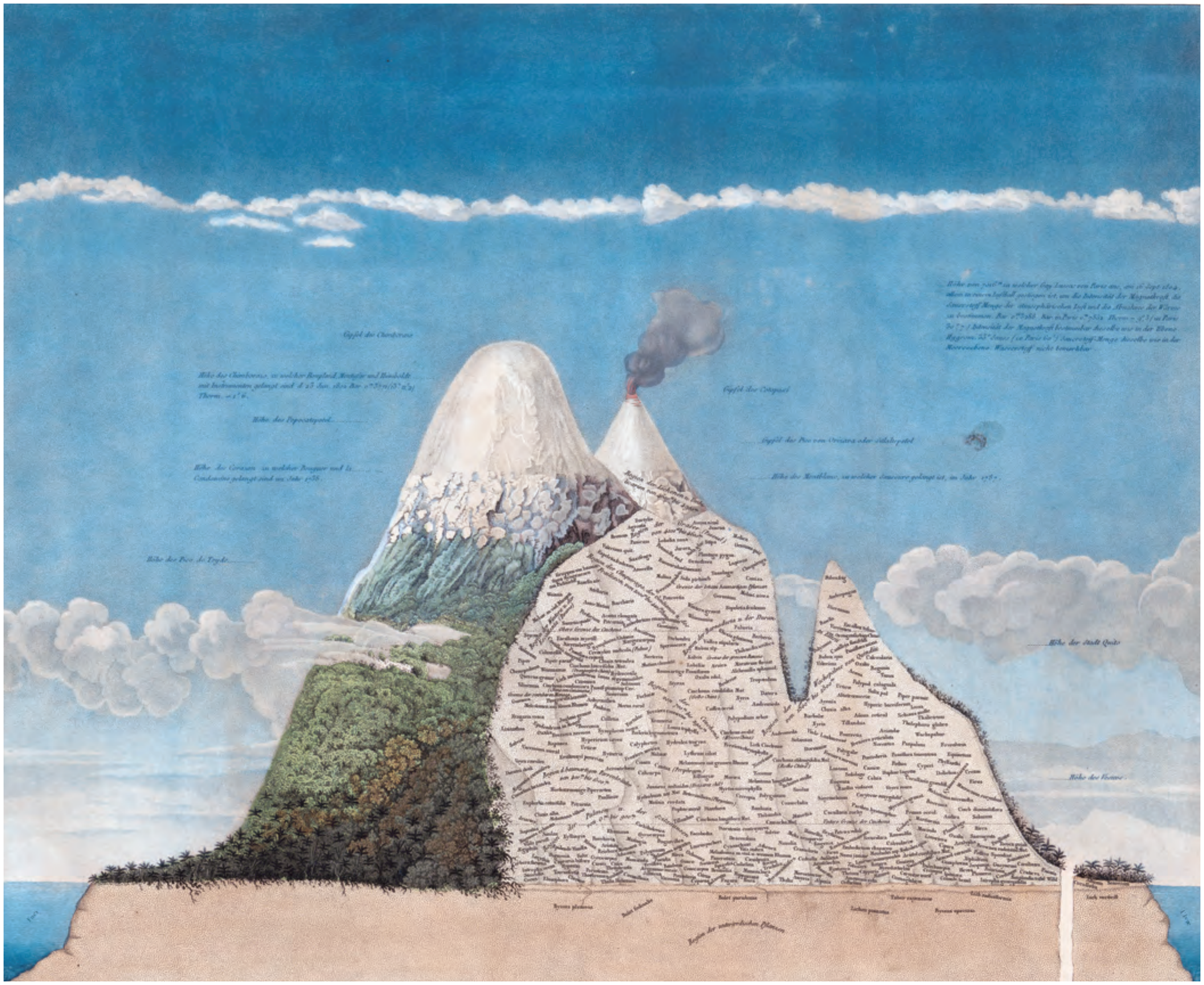
14. Contours With and Without Lines *266*
José Miguel Lameiras

Acknowledgments *280*

Contributors *282*

Index *285*

4. THE STARTING GROUND



BAS SMETS

Inspirations

In the fifteenth century, the term "topography" still reflected its origins in the Greek *topographia*: the description of a place. Its original English meaning, as given in the *Cambridge Dictionary*, refers to the physical appearance of the natural features of an area of land, especially the shape of its surface. In France, even today, they say *faire le topo*—to "make a topography"—which in that application describes an exhaustive inventory of a certain subject. So the word "topography" has had, and continues to have, a broad range of meanings: from the physical characterization of a place as registered in maps to written histories, inventories, and the statistics of a particular place. With this notion of topography being more about understanding than just describing a place, I will first introduce two men whom I find important to the notion of exploring and describing the characteristics of a geographic expanse.

Alexander von Humboldt (1769–1859) traveled through the Americas, noting what he saw while trying to comprehend the underlying systems of natural processes that had produced a certain geology or natural life form. Von Humboldt was among the first geographers to reveal the characteristics of a site by reading how multiple factors interacted. In his well-known diagrammatic section through the Ecuadorian volcano Chimborazo he related the geographic readings of temperature, air pressure, soil type, and plant growth to altitude [4-1]. That is to say, he attempted to truly grasp the forces and processes that shaped natural environments, and their role in producing their vegetation and terrain. This was the foundation for a new way of knowing, wide-ranging and encompassing, that already included the effects of climatic conditions in the evolution of vegetation around the world. He was the person who most inspired Darwin, and much of what Darwin presented in *The Origin of Species* could already be found in Alexander von Humboldt's own writings.

4-1
Alexander von Humboldt and Aimé Bonpland. *Géographie des plantes equinoxiales*, 1805. Considering all his observations simultaneously, Von Humboldt had the extraordinary capability to extrapolate them into general principles. [bpk / Ibero-Amerikanisches Institut, SPK / Ruth Schacht]

The second person of consequence to the field of topography is Eugène Viollet-le-Duc (1814–1879), who was recently brought to public attention when the spire he designed for Notre Dame cathedral in Paris collapsed during the 2019 fire. As a prominent architect Viollet-le-Duc was engaged in many important building restorations of his time, but on holiday he often explored Mont Blanc in eastern France. For more than ten years, in a Humboldtian manner, he described and drew what he saw. He measured the glaciers to understand the processes that shape them, how they form and grow, and how high temperatures and erosion work against them. He understood Mont Blanc as a primordial upheaval that eventually became granite and thereafter acquired its present form through erosion. Perhaps not surprisingly Viollet-le-Duc saw Mont Blanc as a giant piece of architecture, a kind of deliberate design that like a building could be restored to its original form to better reflect the forces that acted upon it.

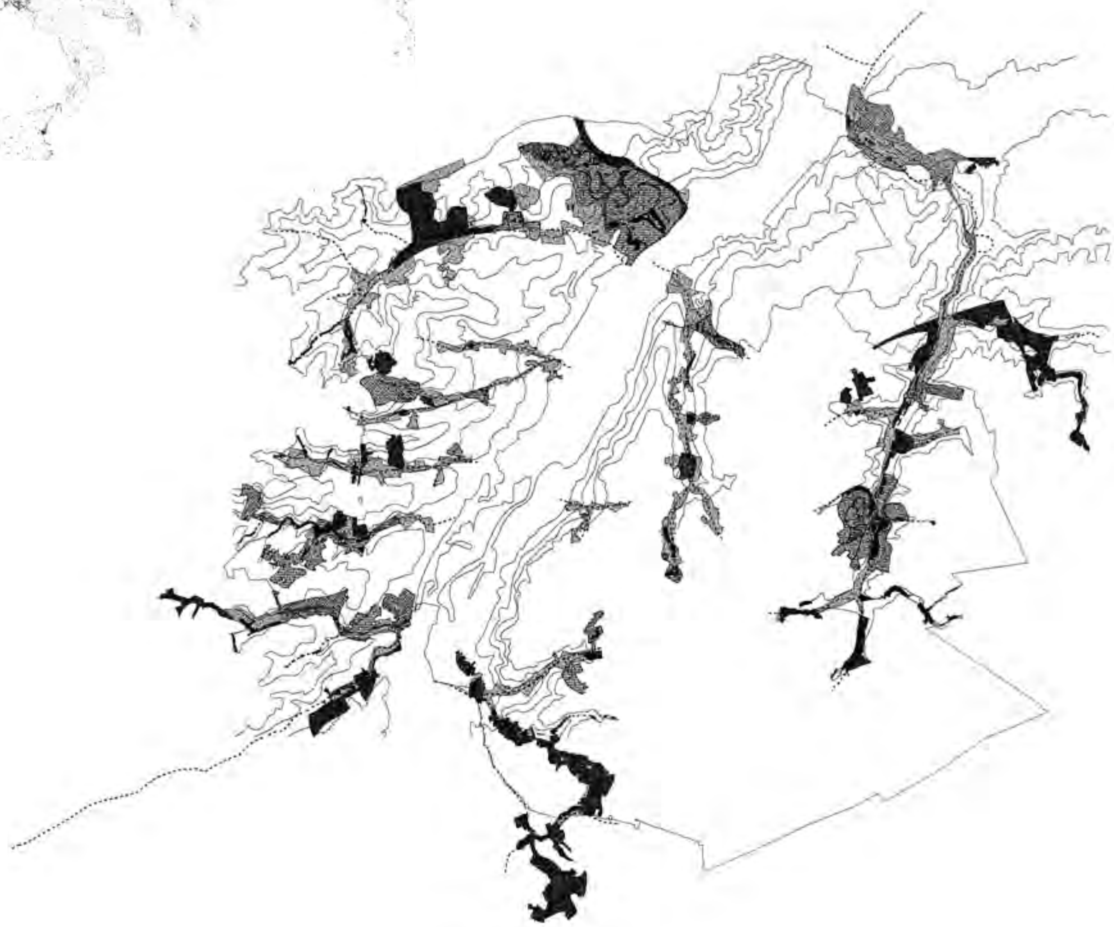
In Viollet-le-Duc's fabulous map of Mont Blanc, the mountain appears as a crystalline rock depicted in two stages of evolution. The first view shows its state today after eons of erosion; the second shows the mountain's "restoration" to what Viollet-le-Duc believed to be its original state [4-2]. To him the processes of erosion were a degradation of an original concept, much like what happens to a building over time. As an architect and archaeologist he looked at nature as a version of built form.

To me these two great innovators, Von Humboldt and Viollet-le-Duc, provide major sources of inspiration. When we design, we try to remember their meticulous research of a site and their relentless pursuit of understanding what lies before them. From this starting point we try to determine how to intervene, how to restore, or how to create a new landscape.

I was neither born in the Swiss Alps like Georges Descombes, nor below sea level like Adriaan Geuze, but instead in a strange country called Belgium. Satellite imagery clearly reveals the endless sprawl that characterizes much of Belgium, a messy urbanism resulting from the lack of urban planning [4-3]. At the border with the Netherlands the differences in national policies are evident and easily discerned in aerial photographs. Dutch planning yields urban space organized and ordered; in Belgium there seems to be a lack of resistance to any kind of planned development, whether a new freeway, the extension of a city, or the replacement of agricultural land by urbanization.

4-2
Eugène-Emmanuel Viollet-Le-Duc. *Le Massif du Mont Blanc*, 1879.
For Viollet-Le-Duc there was no essential difference between human constructions and mountains produced by natural forces. [Département des cartes et plans, Bibliothèque Nationale, Paris]


LE MASSIF DU MONT BLANC
PAR
E. VIOLLET-LE-DUC



If one overlays the built space of Belgium on the map of the country's existing rivers, their lack of correlation is shocking. However, when you look at those waterways in greater detail you understand that these are not major rivers. Our rivers are perhaps 200 kilometers long—less than one-tenth of the Rhine or the Rhône, each of which flows through 3,000 kilometers. Their difference in the fall of their land is about 3,000 meters, while in Belgium the difference is perhaps only 100 or 200 meters at most. In conducting our research we came to appreciate what geologists have always known: that in Belgium we mainly have what are called "rain rivers," that is, rivers with significant flow only during seasons with significant rainfall. In flat terrain any small difference in height becomes significant. The effect parallels that of pouring water onto a glass table: the little cracks in the tabletop determine where the water goes and how it moves. Our office has become obsessed with topography, especially with changes in level as a starting point for developing design. The following five projects illustrate our continually evolving methods and ideas.

4-3
European Environmental Agency. Population Density Map of Europe, 2017. The flatness of the Belgian terrain provided no resistance to development and has resulted in an endless urban sprawl, visible even from space. [GEOstata]

4-4
Bureau Bas Smets. Brussels 2040: City of Tributaries, 2012. Brussels as the city of secondary valleys. The reinforcement of Brussels's eight tributaries creates a new landscape structure that guides development and captures rainwater along the length of large urban parks. Bureau Bas Smets [hereafter BBS].

Rain River

In 2010 the Brussels government asked our office to produce a vision for the city's form in 2040. We began with topographic readings, inventorying the elements of the urban fabric to better comprehend what currently existed. In the nineteenth century the city's main river, the Zenne, was diverted into a subterranean culvert running beneath the center of Brussels. The result: the city lost its river; there was no longer an iconic natural feature to mark Brussels, as the Thames does for London or the Seine for Paris. After uncovering traces of the original waterways we then mapped the city's green spaces. Our findings puzzled us; there seemed to be no systemic logic behind the locations of these green spaces. However, recalling the larger-scale river study we had conducted, we realized that these open spaces reflected a kind of a capillary system of rain rivers that carry runoff to the North Sea.

Under these conditions the tributary becomes almost as important as the primary river. After we traced Brussels's eight tributaries on a map it became clear that 80 percent of the city's green spaces were directly linked to the same system of flow—something that geologists know, of course, but that urban designers, architects, and landscape architects seem to have forgotten. From the lessons learned from mapping we proposed a scheme for Brussels 2040 that would reinforce these eight tributaries traversing the city's nineteen municipalities [4-4]. We thought it would be beneficial to invest in these eight linear water systems to store water and reduce the risk of inundations while simultaneously creating terrain for urban forests. We imagined a new "landscape structure" as a contemporary version of the park systems devised by Frederick Law Olmsted Sr. in the United States. The difference between the two was that Olmsted's designs were made a priori, before urban sprawl, while we were acting a posteriori, within the urban sprawl that already existed and with more of a "make do" attitude. In response, our scheme was based on the physical reality of the eight tributaries running through Brussels which respond ed perfectly to the city's decentralized governmental power structure.

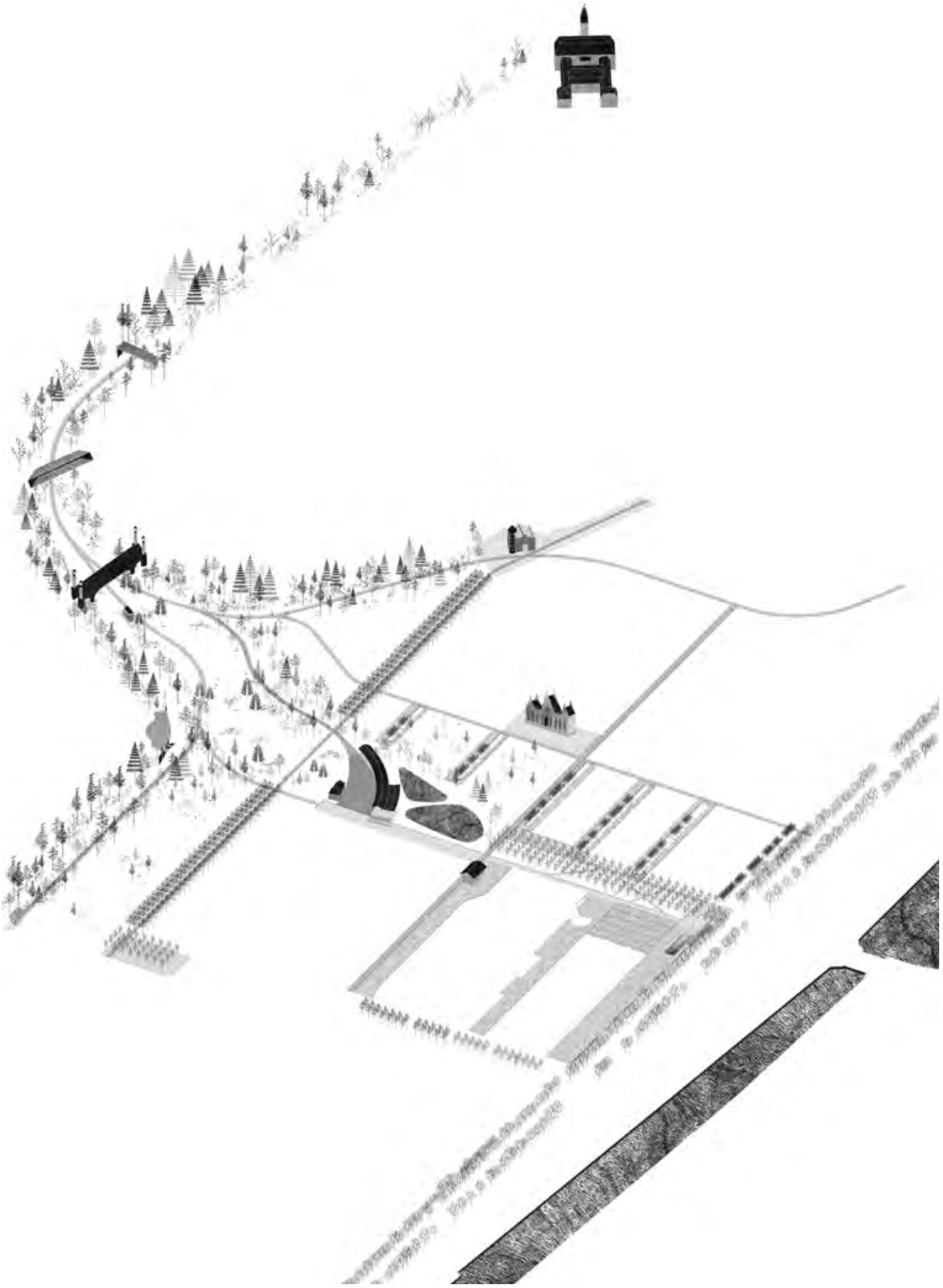
Valley

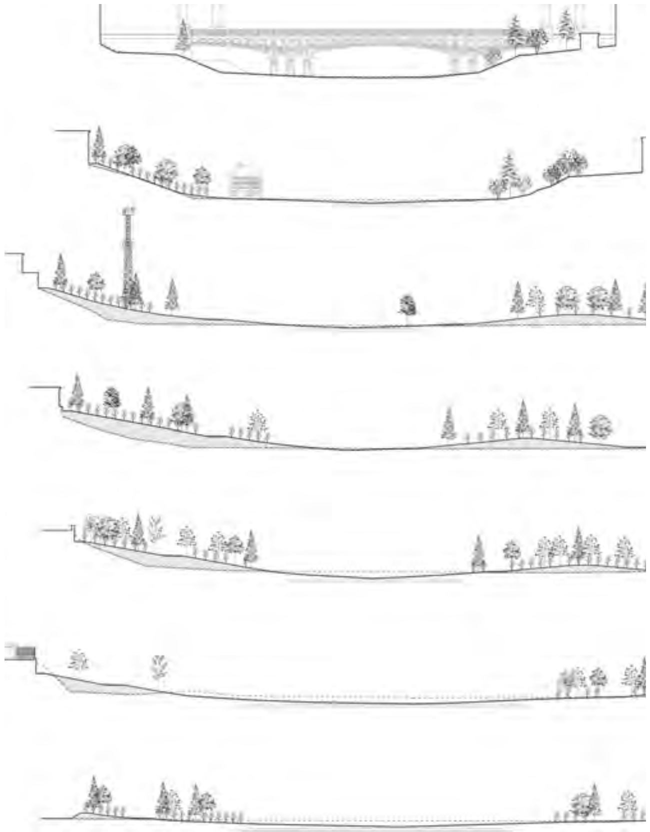
Around the same time that we were conducting the study for Brussels 2040 a developer asked our office to design a park on the site of Tour & Taxis, adjacent to the canal and the River Zenne. Historically, the site was one of the world's first multimodal freight platforms to integrate water, road, and rail transport. Long ago, to create level ground for the railroad tracks a gully had been excavated to shape a horizontal trajectory not unlike a tributary of the secondary rivers that brought water to the city. Based on an understanding of the historical urban patterns, we conceived the park as a dry valley replacing the railroad tracks running beneath the bridges that once crossed the site. Our primary goal for this emblematic site was to create a large park to guide future development. Starting with the idea of retaining elements of the 10-hectare site's industrial heritage—the bridges, stations, warehouses, and platforms—we proposed a transition from wilder spontaneous vegetation along the gully to a more organized landscape that connected to the city center [4- 5].

The park was to be the first designed by our office, and in preparation we studied great Brussels parks from the nineteenth century. This set the standard. We felt that we must do at least as well for our time as they did in theirs—not an easy task considering that our predecessors had at their disposal far more money per square meter relative to their time.

4-5
Bureau Bas Smets. Tour & Taxis Park. Brussels, Belgium, 2017. The park is conceived as a dry river valley with different atmospheres created by the spontaneous vegetation on its slopes, open lawns, and the rows of trees that connect to the city center. [BBS]

4-6
Bureau Bas Smets. Tour & Taxis Park. Sections through the site trace the contour of the ground plane. [BBS]





An additional challenge was that to accommodate the railroad tracks, the terrain had been flattened, with an 80-centimeter (approximately 3-foot) layer of ballast added to support the tracks. As our budget was limited we determined that we could bring no new earth to the site nor haul any away. The top layer of the soil was scraped, stored, and later used to create a natural valley—in this case, one that had never existed before. The site was then planted with 3,000 small pioneer trees and 300 mature climax, or long-lived, species. Over the first three or four years the pioneer trees would grow quickly and form a screen concealing the development on either side of the park, while over time the trees from the climax species would gradually replace them and transform the site into a robust environment.

Since we had to work with what existed on-site, the sections through the site were continually redrawn to reflect the new conditions we encountered there. No calculations were sufficiently accurate to establish how much ballast and how much topsoil actually existed, and what vegetation could be expected to thrive in these new conditions. The design came to reflect a play between an abstract design concept and the specifics determined by the material found on-site. At some point we became desperate about what to do with all the ballast: stones usually large and strong, the properties required for supporting railroad tracks. Then came an idea: if we sorted the stones into their various sizes, perhaps we could reuse them in an underground cistern for water storage. After testing on-site we discovered that by excavating a pit at the bottom of the valley and filling it with the excess ballast, we could store more than one million liters of water beneath the park. We negotiated with the developers and showed them that by creating the underground cistern, there would be no need to divert water from the site, and that in fact all the water could be stored within the park and even used for irrigation. Water management thus became an integral component of the development as a whole, with the park becoming a performing landscape in the process. The ballast was scraped, removed, and filtered into different sizes; larger stones were used in the water reservoir while the finer soils were used in the mix of the surface layer. The medium-size rocks became the foundations for the paths [4-6].

In response to the severe financial constraints, we wondered how nature could work for us. There was neither money to bring in topsoil

4-7
Bureau Bas Smets. Tour & Taxis Park. Brussels, Belgium, 2017. The transformation of an industrial site into an undulating valley by reusing materials found on-site. [Michiel De Cleene, BBS]

nor to sow a lawn. Working with a botanist we determined that planting clover enriches the soil and that over time a lawn would develop on its own, as indeed it did in less than three years. In this sense the lawn chose to live on the site all by itself; we never planted it. Today it thrives and does just what it is supposed to do.

We envisioned a similar principle for the pioneer trees. Willow trees grow very quickly both above and below ground, bringing air and water to this thick clay soil that benefits long-lived species such as the oaks and beeches that were planted. Curiously, in talking with historians after the design and much of the work had been finished, we were told that the railroad had been built in that location because an existing river tributary provided a relatively easy path for the engineers to follow. By imagining the park as a valley we had in fact re-created a preexisting tributary [4-7].

Plaza

Saint-Gilles is one of the nineteen municipalities that comprise the city of Brussels. Since 1865 a daily market had been held on its beautiful plaza, one of the oldest uninterrupted markets in Belgium [4-8]. The arrival of the automobile significantly changed the character of the place, however. It still functioned as a marketplace in the morning, but for most of the day parking prevailed. As a result, the cafés and restaurants with their beautiful, curving façades were struggling to prosper, further hidden by the trees planted to screen the parking spaces. To improve this unfortunate situation the city decided to ban cars from the plaza and hold a competition to convert it to pedestrian use.

Topography was a major concern, as the site dipped about two meters from one end to the other, a distance of fifty meters. We proposed reorganizing the plaza through a series of flat curbs in natural stone, lines that would reveal the building façades while facilitating water drainage [4-9]. Diverging toward the church, the lines restore the building's role as the focal point of the plaza. They also help signal the plaza's diverse functions, which include delivery and available market space. In winter they mark single terraces and in summer, double terraces.

To determine the appropriate hardscape we looked first to the existing plaza and found that half the site had been paved with Belgian

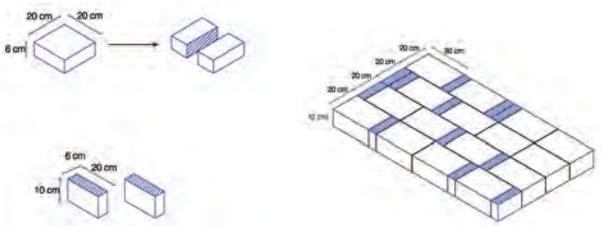
(above left) **4-8**
Saint-Gilles Parvis, Brussels, Belgium. Post card, 1881. Since 1865 the plaza has uninterruptedly housed a daily market [Dexia Banque Postcard Collection]

(above right) **4-9**
Bureau Bas Smets. Saint-Gilles Parvis. Brussels, Belgium, 2018. Diverging lines of bluestone reveal the curved plaza, organize its uses, and collect water runoff. [BBS]

(center) **4-10**
Bureau Bas Smets. Saint-Gilles Parvis. The existing pavers were cut in two and installed on edge. [BBS]

(below) **4-11**
Bureau Bas Smets. Saint-Gilles Parvis. The density of the reused pavers increases toward the valley, creating a giant mosaic. [Michiel De Cleene, BBS]


Bruxelles-Saint-Gilles.
Brussel-Sint Gillis
Parvis Saint-Gilles
Sint-Gillis Voorplein


20 cm
20 cm
6 cm
6 cm
20 cm
10 cm
20 cm
30 cm


L'ATLAS

bluestone, the country's dominant quarried stone. Rather than discarding this valuable resource we felt it should be reused, although its 6-centimeter thickness was insufficient to structurally support contemporary market activities. To address this problem we cut the stones in half and reinstalled them on edge, an operation that yielded about one-quarter of our paving materials at almost no cost [4-10]. We expressed our fascination with topography by varying the number of reused elements in each strip, so that as one moves toward the valley the frequency of the "pixels" increases. The position of each reused stone was drawn one by one in the manner of a giant mosaic [4-11]. The surfaces of the recut bluestones were more brilliant and reflective in both sun and rain than the new granite pavers alongside of which they had been set.

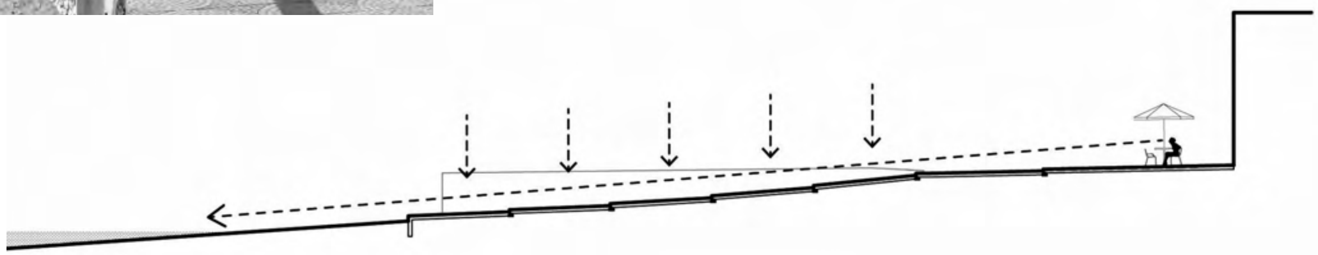
The diverging bands of stone enhance the reading of the plaza as one continuous space, while effectively demarcating the spaces assigned to the outdoor terraces. Seven different species of trees have been strategically planted to further organize the functioning of the plaza and work in concert with the terraces to create a single uninterrupted, flexible space [4-12].

Beach

Himara is a beach town of 11,000 inhabitants on the Albanian side of the Ionian Sea, opposite the heel of Italy and frequented mainly by Greek and Albanian tourists. In 2015 Atelier Albania invited us to participate in an international competition for the refurbishment of the Himara waterfront. Although the beach was the city's biggest attraction, the town was very poorly connected with the sea. Only a few small staircases, set perpendicular to the beach, led down to the water. The two-meter-high seawall had been backfilled after construction, with its surface used for parking, awkwardly planted with olive trees, and decorated with an old millstone. From seats along the waterfront only parked cars were visible, with not even a glimpse of the water [4-13].

On our first visit to the site it was cold outdoors, cold in the hotel, and cold in the restaurant. The conditions were so poor it was hard to believe the competition was authentic. Was this for real? Atelier Albania had received funding from the European Union to organize the competition, but would they really build the winning entry? At the same time, so much uncertainty

4-12
Bureau Bas Smets. Saint-Gilles Parvis. Brussels, Belgium, 2018. The stone bands, the trees, and the terraces form one continuous space adaptable to many different uses. [Michiel De Cleene, BBS]



granted considerable freedom, and I decided to imagine the best, even most utopian scenario. I started dreaming of a coastal pine forest and a beach shaped by erosion, like the Turkish Steps in Sicily.

We began looking for a way in which to reorganize the entire space by applying the logic of a natural system. Our proposed solution was simple: demolish the retaining wall and address the level difference with a sequence of stepped platforms that, in addition, would absorb the impact of the waves more effectively than the existing vertical wall [4-14]. Our competition entry was based on the transformation of the beachfront primarily through its section then applied and extruded along more than 300 meters of coastline. And we won.

A linear grove of Italian stone pines (*Pinus pinea*), imported from nurseries in Italy, was planted on the higher terraces, where their roots would grow above sea level and be less threatened by salt. The platforms were made of concrete using carefully washed sand from the beach, thus appearing almost as solidified sand. Daily tidal changes deposit sand on the terraces and blur the line between the beach and the buildings along the waterfront. The grove of pine trees has since matured and become a shaded promenade where people shelter from the sun [4-15] .

The municipality demanded that the street fronting the beach remain open to traffic. We countered that the waterfront should be pedestrian and proposed paving the street with the same material as the promenade so that if desired, it could be closed for special events. Time has proven us right. At first the street was closed only on weekends, but today traffic is completely banned. There is full access to the waterfront, and the sea is always visible from the terrace. An additional benefit is that from the water, the unremarkable buildings that line the promenade are no longer visible, and that you only see the pine forest that screens the buildings and grants them only a secondary role [4-16].

4-13
Existing Waterfront. Himara, Albania. Prior to the new construction a high seawall blocked both the access and the view toward the beach. [BBS]

4-14
Bureau Bas Smets. Himara Waterfront Himara, Albania, 2017. A series of stepped platforms better absorb the impact of the waves, while providing full accessibility. [BBS]

4-15
Bureau Bas Smets. Himara Waterfront. The platforms continue the sandy beach as if they are made of solidified sand. [BBS]

Park

Arles, which lies between Montpellier and Marseille, was among the greatest cities of the Roman Empire, second only to Rome itself. The city center is characterized by a network of small public spaces—all very mineral. Adjacent to the center lies

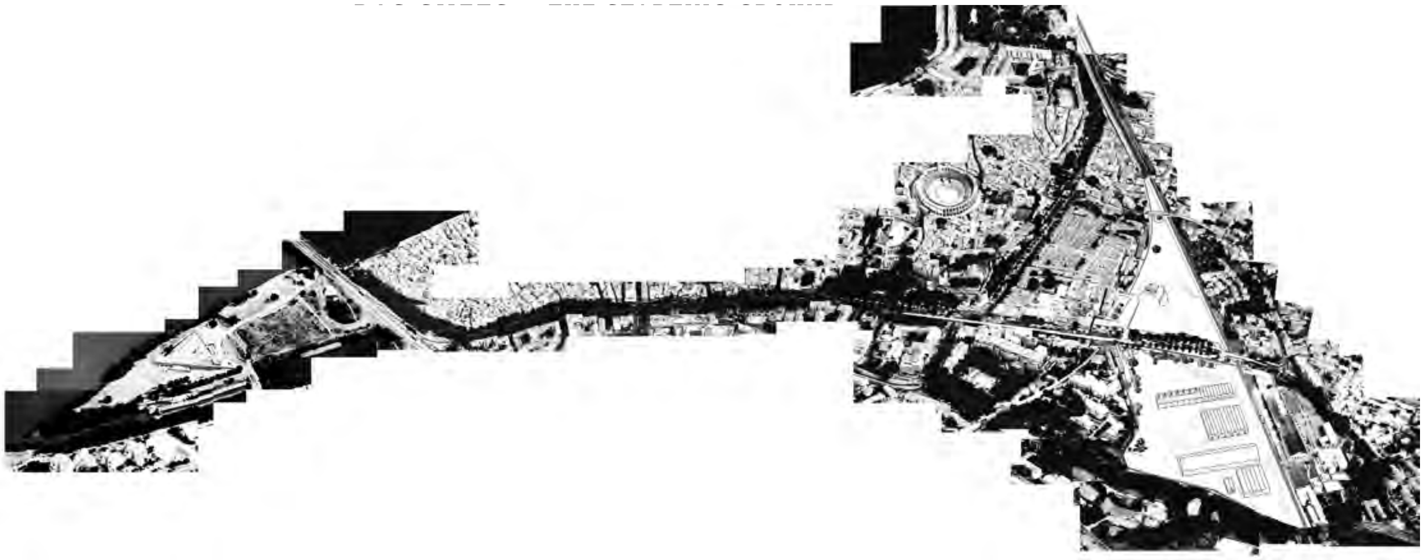
a former industrial site, the Parc des Ateliers, an open space somewhat similar in size to our Tour & Taxis park in Brussels. Once a railroad yard used to repair locomotives, the site was carved from the bedrock to be perfectly flat. There is no soil, no water, only rocks [4-17].

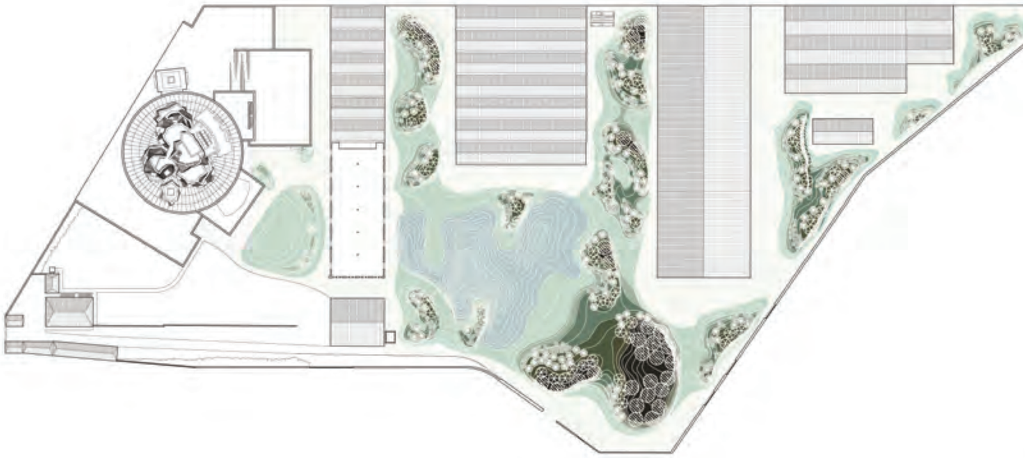
Maja Hoffmann from the LUMA Foundation asked us to design a landscape for this barren space, destined to become a new center for creating and exhibiting art. Annabelle Selldorf would convert the old industrial buildings; Frank Gehry would build the centerpiece: a tower for the arts. The lack of obvious landscape features troubled me when I first arrived on-site. In Belgium we often bemoan that we're neither artificial enough to be exciting nor natural enough to be beautiful; we are stuck somewhere in between. But this sterile site seemed even worse than the typical Belgian situation, requiring a new attitude and approach to discover qualities of beauty and interest.

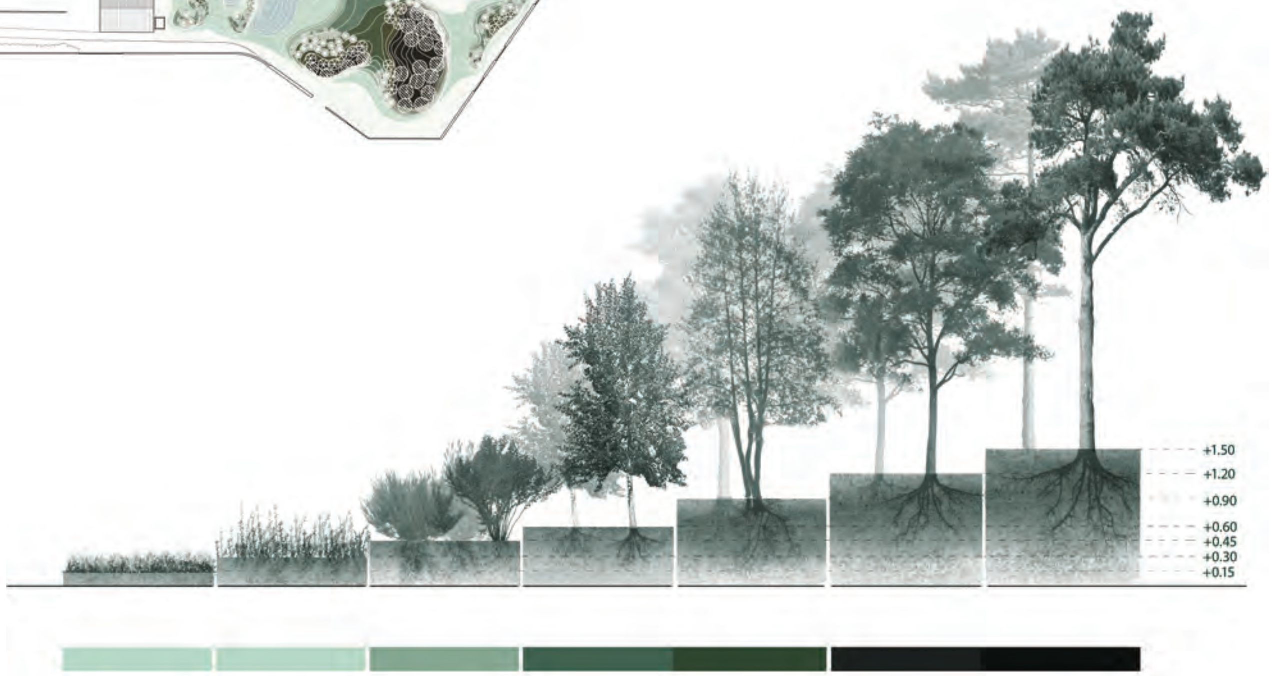
After intense study, we determined that three types of landscape comprised the site, each marked by dramatically different geographical conditions: the Crau, the Camargue, and the Alpilles. The Crau is the bed of a former glacier, today strewn with rocks and lined with an impenetrable layer of clay, a landscape where no tree can grow. The Camargue occupies the estuary between the turbulent Rhône and the Mediterranean; the Alpilles are the southern extension of the Alps. One landscape is very wet, one is very dry, one is very mineral. Seen on a map it appeared as if those three landscape types were reaching out toward our site. How could we utilize the foremost characteristic of each to bring nature back to this sterile land? We spent considerable time exploring those geographies that are, perhaps ironically, one of the richest environments in Europe for both plants and animals.

The site had been, in part, carved from bedrock, and built atop a Roman necropolis. Due to its historical significance we were not permitted to dig, and instead sealed the ground before installing a garden above it on a new layer of soil. Other constraints such as fire-engine access and underground services determined the places where we could model a new topography to support vegetation growth. In Arles another consideration is the mistral, a northerly wind that blows straight from the Swiss glaciers that follow the Rhône and brings with it ice-cold temperatures. There is a saying that when the mistral blows, it makes

4-16
Bureau Bas Smets.
Waterfront.
Himara, Albania, 2017.
A grove of pine trees provides shade. Seen from the water, the trees form a coastal pine forest.
[BBS]






+1,50
+1.20
+0.90
+0.60
+0.45
+0.30
+0.15

you crazy; and when it arrives with a velocity of about 100 kilometers per hour, everyone stays indoors.

Drawing on what we learned in designing the Tour & Taxis park we questioned how we could use the forces of nature to transform the site. What would happen if we didn't do anything on the site for ten years, one hundred years, two hundred years? How would nature appear and how would it develop over time? Studying the wind patterns, we understood that wind, particularly the mistral, would bring sediment over time—and when deposited, sediment creates topography. The new terrain would create different environmental conditions, which would in turn support the growth of various types of vegetation. That exercise was much like science fiction, of course: you establish the rules and then you follow these rules, rules of your own making. We modeled how the landscape would be formed when interacting with the buildings. We imagined that the strong winds, when diverted by the buildings, would first scour a depression for a lake and then deposit sufficient sediments to create a dune. The resulting ground would have an asymmetrical section that, coincidentally, would create a comfortable climate: in summer people could relax on the soft slope in the shade of the trees; in winter they could walk along the steeper slope, protected from the wind by plants growing on the dune [4-18].

Topography was a major concern, as the soil needed to be sealed to ensure that no roots entered the archaeological site. Pioneer trees that grow in very shallow soil were planted, to be followed in an ecological succession by pine trees requiring at least one or two meters of earth [4-19]. In terms of experience, a walk through the space would become a walk through time—one that could potentially illustrate 200 years in succession. All the levels on which the trees had been planted were maintained. A walk on the site reveals the pine trees growing on one level, the oaks on another, the maples on yet another. This logic was applied to the entire six hectares of the park [4-20].

Although there was neither sufficient soil nor sources of water on-site, those problems were mitigated by an adjacent sixteenth-century canal, which brings irrigation to the Crau. An agreement was struck with the company that manages the canal to allow us to pump its water into a new pond. After filtering, the water is used to irrigate the newly planted vegetation.

4-17
Bureau Bas Smets. LUMA Arles Parc des Ateliers. Arles, France, 2021. The Parc des Ateliers had been carved from the bedrock to create a level terrain. Graced with neither earth nor water, the site was barren. [BBS]

4-18
Bureau Bas Smets. LUMA Arles Parc des Ateliers. Site plan. The design is based on accelerating natural processes. [BBS]

4-19
Bureau Bas Smets. LUMA Arles Parc des Ateliers. The depth of soil brought by the mistral wind reflects varying types of vegetation, planted as a spatial version of ecological succession. [BBS]

The mounds were constructed layer by layer, guided by GPS and then planted with vegetation. In total more than 1,100 trees and shrubs have already been planted, from large to small. First the pine trees, then the oaks, then the remaining species—as if following an inversed ecological succession. More than 80,000 smaller plants introduced more than 140 different species to the site and completed the scheme. Even while still under construction, animal life started to return to the site. Birds seem to smell the changes, and new species have been spotted. The evaporation of the pond and the evapo-transpiration of the leaves have already created a new microclimate. The semidesert conditions of this former industrial site have already transformed into those of a Mediterranean climate.

In closing I would like to return to the idea of the section, and expand the understanding of topography with the same notion that Vladimir Vernadsky once used to describe the biosphere: that in the end, the space in which life occurs is quite constricted: 300, 400, or 500 meters wide in an atmosphere only about twelve kilometers high. For Vernadsky the biosphere is the composite of all living things combined with all the former organisms that have died. Fossil fuels, most minerals, the entire layer in which plants and animals grow—all are a part of this biosphere. The living entity that draws on both the atmosphere and the ground is, of course, vegetation. This is the topographical layer in which we live, the interface between a stable geological reality and an uncertain meteorological evolution.

4-20
Bureau Bas Smets. LUMA Arles Parc des Ateliers. Arles, France, 2021. By planting some 1,200 trees and 80,000 plants, the semidesert conditions have transformed into a Mediterranean climate. [BBS]