

The Botanical City

The Botanical City

Matthew
Gandy
and
Sandra
Jasper
[eds.]

Contents

16 Part 1 Histories and taxonomies

6
The city as a botanical field
Matthew Gandy and Sandra Jasper

18
Signs of life: interview with Herbert Sukopp
22
The metabolic city and the city of biotopes:
Paul Duvigneaud and
Herbert Sukopp
Jens Lachmund

30
Urban granaries, planetary thresholds
Nigel Clark

38
The flora of bombed areas (an allegorical key)
Seth Denizen

46
Vegetation as testimony: botanical traces of the urban past
Moritz von der Lippe

54
The curious disappearance of the Ennore Creek
Bhavani Raman

62
***Phoenix canariensis* in Lisbon's new ecologies: a post-phenomenological tracing of a palm tree in a disused gasworks**
Daniel Paiva

71
Urban plants and colonial durabilities
Henrik Ernstson

82
***Ailanthus altissima*, or the botanical afterlives of European power**
Bettina Stoetzer

91
Seeing, surveying, and sorting urban trees: the 1970s street tree project in Dresden
Sonja Dümpelmann

100
Vertical ecologies: the balcony biotopes of Berlin
Dorothee Brantz

107
Drying greens, commons, and the possibilities of the botanical (in one quiet corner of London)
Marcus Nyman

120 Part 2 Botanizing the asphalt

122
The flight of seeds
Mara Polgovsky Ezcurra

131
Dandelions at work: a street corner tale of ecosystem services
Alexandra R. Toland

139
Plants in the urban night
Bergit Arends

146
Toxic tour: Houston's environmental apartheid and institutional liberation
T. J. Demos

161
Queering the transect
Matthew Gandy

<p>170 Walking with plants: disrupting the material logics of <i>degrado</i> at the banks of Turin's Stura river Lucilla Barchetta</p> <p>178 Following mosquitoes into an urban forest Nida Rehman</p> <p>185 Rhizome city: tracing knotweed through the soils of Brussels Livia Cahn</p> <p>196 Part 3 The art of urban flora</p> <p>214 Part 4 Experiments in non-design</p> <p>216 Framing urban landscapes: interview with Susanne Hauser</p> <p>221 Acoustic botany: listening to nature in a former airfield Sandra Jasper</p> <p>229 There's life in dead wood: tracing a more-than- human urbanity in the spontaneous nature of Gothenburg Mathilda Rosengren</p> <p>237 From undead commodities to lively labourers: (re)valuing vegetal life, reclaiming the power to design-with plants Marion Ernwein</p>	<p>243 Tracing the urban pastoral in Tallinn: Leo Marx, Karl Marx, and urban political aesthetics Maroš Krivý</p> <p>253 Tokyo ecology: the Akabane Nature Observation Park Kumiko Kiuchi</p> <p>266 Red leaves Suili Xiao</p> <p>272 Part 5 Cartographic imaginations</p> <p>274 Urban plants: a window on how ecology becomes evolution Peter Del Tredici</p> <p>282 Discovering and mapping urban plants Mark Spencer</p> <p>293 Mapping the urban flora of Berlin Birgit Seitz</p> <p>300 Nature is for everyone: investigating attitudes to urban biodiversity Leonie Fischer</p> <p>305 Urban cemeteries in Berlin and beyond: life in the grounds of the dead Ingo Kowarik</p> <p>314 Contributors</p> <p>322 Acknowledgments</p>
---	---

The city as a botanical field

Matthew Gandy and Sandra Jasper

The one tree in Francie's yard was neither a pine nor a hemlock. It had pointed leaves which grew along green switches which radiated from the bough and made a tree which looked like a lot of opened green umbrellas. Some people called it the Tree of Heaven. No matter where its seed fell, it made a tree which struggled to reach the sky. It grew in boarded-up lots and out of neglected rubbish-heaps and it was the only tree that grew out of cement. It grew lushly, but only in the tenement districts.

Betty Smith, *A tree grows in Brooklyn*¹

In Betty Smith's description of the tree of heaven (*Ailanthus altissima*), also known as the "ghetto palm," the tree is contrasted with the memory of a school poem that evoked the "forest primeval" with its "murmuring pines and hemlocks." For Smith, writing in the early 1940s, the presence of this tree was a marker, or even harbinger, of neighbourhood decline. The tree of heaven serves as a symbol of an American modernity gone awry. In this essay collection, by contrast, we are interested in disentangling some of these aesthetic and ideological strands that suffuse the idea of "weeds" or "alien plants" in the urban landscape. We explore a series of intersections between cultural and scientific readings of urban space in which the presence of spontaneous plant life serves as a portal into alternative interpretations of urban nature.

What does it mean to regard the city as a botanical field? The history of botany and the history of urbanization are deeply entwined. We know that many early cities had elaborate gardens and other complex reconstructions of an idealized nature: plants from distant places were often chosen to symbolize the geographical reach of imperial power. Plants were selected on account of specific properties, such as their aesthetic characteristics or shade-providing foliage. There is also evidence for the widespread cultivation of plants in cities for culinary and medical use, with some of the earliest treatises on urban botany devoted to useful species growing within and around the city.²

However, the historical record contains less information about those traces of vegetation that simply developed spontaneously in association with human settlements or emerged in the wake of previous waves of human activity. The emergence of “urban botany” as a distinctive field of scientific curiosity can be traced to unexpected profusions or distinctive combinations of plants. The ecological effects of disturbance, for example, were observed in London after the fire of 1666, while a growing fascination with the flora growing on walls and ruins is exemplified by Richard Deakin’s study of Rome’s Colosseum, published in 1855, where he found some 420 different species, including several highly unusual plants found nowhere else in Europe.³ During the nineteenth century, some of the first “urban floras” were published based on intricate investigations of modern cities, often taking advantage of new railway lines to explore fragments of nature on the urban fringe. In the twentieth century, new spaces of urban botanical discovery emerged in the wake of wartime destruction, especially from the creation of “rubble landscapes” or “bomb sites,” along with the establishment of security zones engendered by geopolitical tensions. From the early 1970s onwards, urban ecologies were further transformed through the impact of economic dislocation and demographic decline, which produced a variety of post-industrial “wastelands” and other types of anomalous spaces. Comparative studies of urban vegetation have drawn attention to the high levels of species diversity to be found in cities, comprising not just the persistence of previously existing plants but also a range of new arrivals. This leads to a distinctive pattern of elevated levels of overall biodiversity, combined with increasing degrees of homogeneity at larger spatial scales, marked by the global success of more well-established synanthropic species.⁴

Ecologies of neglect or abandonment have produced a variety of unusual biotopes that have been a focus of both cultural and scientific fascination. For many decades, urban botanists have been challenging existing conceptions of “plant sociology” along with a variety of vegetation taxonomies derived from “natural” ecological systems that have an uncertain relationship with landscapes modified by human activity. In a parallel development, “urban ecology” has gradually become a more significant element within the broader science of ecology, even to the extent that “anthropogenic biomes” are framed as the new analytical focus under the Anthropocene, with one study suggesting that just 11 percent of terrestrial ecosystems can be regarded as “wildlands.”⁵ From the perspective of urban botany, however, it is very much the innate “wildness” or spontaneity within urban ecosystems that remains the focus of attention.

Ruins, wastelands, and other types of interstitial spaces serve as heterotopic spaces of discovery and collective memory. When we encounter plants in cities it is helpful to differentiate between “remnant,” “constructed,” and “adaptive” kinds of ecological assemblages. Remnant vegetation encompasses the kind of plant communities that predated intensive human modification of the regional landscape: in terms of contemporary urban landscapes, these “remnant ecologies” might include areas of woodland that have become incorporated into park systems or pockets of lacustrine vegetation alongside lakes or rivers. Constructed forms of

Histories and taxonomies



Part
1

Signs of life: interview with Herbert Sukopp

Herbert Sukopp is one of the key figures in the post-war emergence of urban botany as a distinctive scientific field. We bring together excerpts from three interviews undertaken in November 2012, March 2013, and July 2015.

Matthew Gandy How did you discover the field of urban botany?

Herbert Sukopp Slowly, from outside to inside, so to speak. My dissertation was an examination of the moors of Berlin that were furthest away from the city. Historically, Berlin had a surprising number of lakes and moors stemming from the ice age, and this was my first field of research. After that, I became interested in the reedbeds of the Havel river and the conditions of the riverbanks and lakesides. From there, I moved on to study urban parks, and finally the *Stadtbrachen* (urban wastelands) in central Berlin.

Matthew Gandy In the 1950s a specific interest in Berlin's *Trümmerlandschaften* (rubble landscapes) emerged. Could you tell us more about it?

Herbert Sukopp This interest developed not only in Berlin but worldwide.

The city became a large-scale experiment, comparable in scope only to the first colonization of bare ground covered in volcanic ash and rubble. There was an astonishing abundance of species that spread phenomenally fast. This was nothing new in itself, but the scale across so many cities was unusual.

Sandra Jasper How did you begin studying these urban sites?

Herbert Sukopp Travelling by tram, I often saw something interesting. I knew there had to be something there because of the structure of the surface. I started to select and examine twelve quadrats that were further systematically analyzed by my colleague Wolfram Kunick. At first, we only sought out the most interesting discoveries. This developed into a methodical programme, with a certain number of field sites in densely built-up areas, loosely developed areas, and so on, to be representative of Berlin as a whole. However, this proved difficult with field sites of one square kilometre in size that were simply too large and internally heterogeneous to allow for comparative analysis across the city as a whole.

Sandra Jasper With whom did you collaborate in Berlin?

Herbert Sukopp I mostly worked with Hildemar Scholz, who began to identify unfamiliar and often non-native plants to figure out what they were. In the beginning, we could only identify two-thirds of the plants with one third completely unknown to us.

Matthew Gandy How did you manage to identify these plants without the help of the necessary books and scientific knowledge? How difficult was it back then?

Herbert Sukopp We were lucky in that we had access to a large herbarium in the Botanical Museum in Berlin, where specimens of almost every species from across the world were available. More difficult cases could also be handled by specialists. *Chenopodium botrys*, for instance, was given to Paul Aellen in Switzerland, and other examples of the Chenopodiaceae to Russian colleagues. Many things are only possible through international collaboration.

Matthew Gandy How would you describe the science of urban botany at the time, compared to its forms in earlier periods, such as plant sociology for example? Did urban botany differ from previous work?

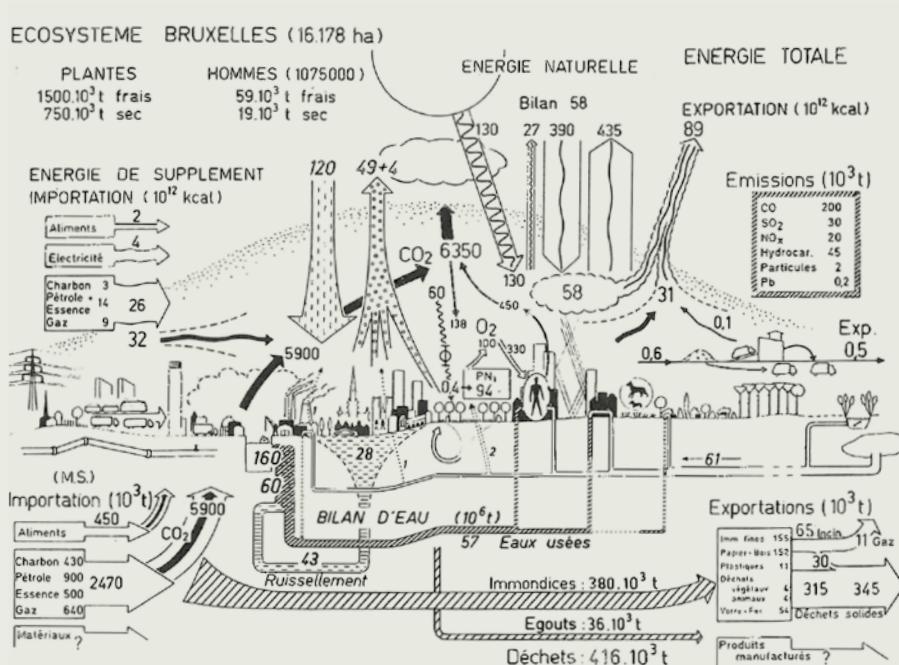
Herbert Sukopp Yes. Berlin has a long botanical tradition that also acknowledged plants growing in the city centre. Our oldest flora by Carl Ludwig Willdenow was written in 1787. It mostly focuses on plants of the surrounding countryside, which was very rural at that time with vineyards, fields, and meadows. But this flora includes a remark in Latin, *in urbe ipsa*, which means that a plant can be found in the city itself, and not only in the wider circle surrounding the city that the flora was usually comprised of.

The 19th of March 1953 marks the beginning of urban botany in Berlin. On that day, my colleague Hildemar Scholz began studying the flora of Lützowplatz, and made his first notes about plants that were already sprouting in early spring including *Chenopodium botrys*. He studied the flora and I studied the vegetation patterns. One could say that this is the starting point for urban botany after the war.

A pivotal point in Berlin was the shift from a purely botanical analysis to an inquiry that mattered to people. This beautiful analysis of flora that we take pleasure in was “dead material” for urban planners and policy makers: the data was filed in cabinets and simply forgotten. Only when we established the connection between specific land-use types, urban development, and plants could we then foster a wider interest in urban botany.

Sandra Jasper Could you tell us a bit about the significance of the Red List for endangered plants in an urban context?

Herbert Sukopp Surprisingly, the recent editions of the Red List have stood up in court, so that one has something tangible to argue with. Previously, with the earlier versions, people would not consider it as legally relevant evidence. Currently, we have the fourth edition of the Red List for Berlin. When you look at them side by side, you can demonstrate historical disparities and prove that changes are taking place. People can't claim that things have stayed the same and that nothing has changed. In this sense,



Cross-section of Brussels. Source: Paul Duvigneaud, Simone Denaecker-De Smet, and Martin Tanghe Carte écologique de l'occupation du sol et des degrés de verdurisation de l'agglomération bruxelloise (Brussels: Service de l'environnement, 1977).

The visual and classificatory techniques that Sukopp and Duvigneaud employed in their maps likewise emphasized quite different themes. As part of a “biotope mapping project” for the Berlin Senate, the Sukopp approach created various maps which depicted Berlin as a mosaic of 57 “biotope types.”¹⁹ Each biotope type referred to an area of one dominant land use that was associated with a characteristic assemblage of plant species. Besides open spaces such as fens, forests, and wastelands, this also included different development types, which were neatly differentiated according to their spontaneous and planted vegetation. The map of Brussels, which was also produced for local planning purposes, divided Brussels into five “zones of greenness” (*verdurisation*) which stretched more or less concentrically from the “grey zone” of the inner urban area to the “green zone” on the outskirts.²⁰ “Greenness” was thus understood as the sheer density of “biomass” of the plant coverage, so that “biological productivity” can be seen as the ultimate theme of this map.

Which political visions were associated with these two approaches? One should not overestimate the differences, as both botanists agreed about the value of green spaces for the improvement of urban living conditions. Sukopp, however, understood greening efforts of this type as an urban version of nature conservation. While traditional nature conservation had often treated the city and nature as opposites, Sukopp posited that cities harboured diverse and valuable species, and that it was specifically this diversity of species which was beneficial for urban

inhabitants. He claimed that typical urban biotopes such as parks, garden areas, and, notably, wastelands were just as worthy of preservation as the allegedly pristine landscapes of the countryside. He therefore sought to align his research with a comprehensive policy of urban landscape planning, notably through his work for the Berlin Senate's Species Protection Programme. Consequently, this programme made detailed recommendations for how species diversity in each of the 57 biotope types could be improved.

Duvigneaud was much more assertive than Sukopp in linking his ecology to a broader moral and political vision. Ecology, he wrote in 1970, should take a leadership role in a "permanent green revolution" and a "renewed socialism."²¹ In contrast to the Marxist associations that these terms might evoke, what he was describing was a rather technocratic project. Accordingly, it included more efficient management of natural resources to help combat hunger in the developing world, and better integration of industrial society with the cycles of nature. Additionally, with regard to cities, Duvigneaud considered ecology primarily as a means to rationalize urban planning. Thus, Duvigneaud drew a direct link between his urban ecology and the modernist urbanism of Le Corbusier and the Athens Charter, which he characterized explicitly as "urban ecological."²² In accord with Le Corbusier, he considered fresh air, sunlight, and recreation spaces to be preconditions of any livable city. In addition, he also made some (not very developed) suggestions for how the urban metabolism could be improved, for example by promoting collective transport, the use of the underground for traffic, the creation of pedestrian streets, and the greening of the city with parks and planted façades. The concept of biological productivity lost its original link with the issue of food production in these treatises on the city, but remained politically significant in that it expressed the vitality of the urban ecosystem and its ability to provide various benefits (what is now referred to as "ecosystem services"). While the mapping of Berlin's biotopes went hand-in-hand with the stipulation of very concrete space-specific conservation and management measures (which were often watered down during the actual planning), Duvigneaud's elaborated ecosystem model had a much more indirect political effect. It served mainly as a means of framing the environment as a public problem and of legitimating future measures, while providing little instrumental guidance for the actual implementation of such measures. Interestingly, those parts of Duvigneaud's work which actually did have a direct impact on planning decisions were in fact those in which he was least ambitious in his application of ecosystems theory, and in which he relied more on classical vegetation analysis.²³

Thus, while both botanists wanted to make their cities greener, "green" meant quite different things to each of them. For Duvigneaud, urban green was an expression of the biological productivity of an urban ecosystem and part of its complex metabolic mechanisms. For Sukopp, greenness was a question of biological diversity, both in terms of the kind and number of urban species and of the varieties of "biotopes" in which these species assemble. The distinctiveness of these two projects of urban ecology clearly reveals how the ways in which we know the botanical city are entangled with different political visions of how such a city should

Urban granaries, planetary thresholds

Nigel Clark

In the distance, we catch sight of the walls, tall and sheer as escarpments but boasting straight edges such that only a god would dream up. We have come “here” because we no longer have a “there.” ... When the rains retreated, we wandered farther and wider, until our cattle grew lean and our own bones showed through our hides. Finally, when hope abandoned us, we rounded up our remaining stock and shouldered what we valued too much to leave to the locusts and the winds. Our bearings we took from the gossip of merchants, our route was a spattering of wells strung together by hoof prints. The last of our livestock and our small treasures we traded along the way, leaving us with only the dwindling strength of our backs. Descending from the plateau to the river valley, we saw for the first time multitudes of stooped bodies worrying at tall golden stems sprung from muddied water ... Finally, we arrive at a break in the wall, a gateway guarded by soldiers whose gazes weigh up our tired limbs as we once eyed the gaunt flanks of our cattle. Though we try to stand tall, fear curdles with the hunger in our bellies. If the guards permit us to pass through, who can say what will happen to us—we who know everything about herding cattle and nothing of tussling with overgrown grass? And we cannot but wonder—have those great walls been built to keep out strangers like ourselves? Or are they intended to keep in the kind of people we may be about to become?

“Thresholds,” observes geographer Clive Barnett, “are the very scenes for the drama of responsiveness, hospitality and responsibility.”¹ In the opening decades of the third millennium, city life seems once more to hinge upon the timeworn, troublesome presence of walls and gateways, barriers and breaches. Today, it is not only a matter of who is entitled to enter and share our urban spaces but an issue of how cities will cope with critical transitions in climate and the greater earth system. Or rather, it is the challenge of both of these at once: the question of how to organize our cities “responsively” at a time when transgressing limits in the very operation of our planet looks ever more likely to estrange, unsettle, and mobilize large numbers of people.

And in this context, for all that the “complete subordination of the agrarian to the urban” may have been accomplished, as Henri Lefebvre proposed,² we would do well to keep our granaries stocked. For there is neither sharing nor withholding without the stuff of livability.

In the midst of a discussion on the way that social-spatial relations have become not only world-wide but “planetary” in their scale and consequences, Lefebvre paused to meditate on the way so much of the language we still use to make sense of the world has “a peasant and artisan origin.”³ The term “threshold” clearly invites such a reading. As linguist Anatoly Liberman teases out:

Most probably, the threshold was a place where corn was threshed (a threshing floor). The word contained a root and a suffix. That suffix has undergone numerous changes, for people tried to identify it with some word that could make sense to them. What remains unclear is not this process but the semantic leap. We are missing the moment at which the threshing floor, however primitive, began to denote the entrance to the room.⁴

I want to take the agrarian origins of the threshold, in all its obscurity, as a provocation to probe the idea of “planetary urbanization.” Elaborating on Lefebvre’s notion of “the planetarization of the urban,” contemporary theorists have destabilized the idea of cities as discrete objects and explored how urban socio-spatial processes are transforming the entire surface of the earth.⁵ In the course of subjecting the concept of the city to a thorough interrogation, however, it is not always so clear what these urban thinkers make of the earth’s own boundaries, properties, and dynamics.

While Lefebvre deserves credit for recognizing the environmental significance of the urban, his later writings come just in advance of scientific claims that there are critical thresholds in the functioning of the earth as a whole. The idea that global climate is capable of moving abruptly over a limit into an entirely new regime or state emerged in the 1980s from research into polar ice cores and other proxies of past climate—though it also built on studies of smaller-scale shifts in ecological systems.⁶ Over the intervening decades, geoscientists have been piecing together how the different components of the earth system interact—and exploring how these tight relationships or “couplings” make it possible for the entire planet to shift abruptly from one “operating state” to another.

This possibility is conveyed by the thesis that human activities may be nudging the earth out of the geological epoch of the Holocene—11,700 years of relatively stable conditions following the last ice age—into a novel state referred to as the Anthropocene.⁷ The idea of the Anthropocene raises difficult questions about what kinds of human impact matter most—and about when members of our species first started to have cumulative impacts on earth and life processes significant

Vegetation as testimony: botanical traces of the urban past

Moritz von der Lippe

It was just as the total renovation of the *Heimstättensiedlung* in Jena (a city of about 100,000 inhabitants in the federal state of Thuringia, Germany) was about to begin that I discovered wildgrowing forest violets, orchids, and devil's claws in the hedges of its front gardens. These species are not rare in the forests around Jena, but I had never seen them in a housing estate before. In Germany, these species are considered indicator species of ancient woodlands.¹ The *Heimstättensiedlung*, an early Garden City² of the 1920s, was also old, but was it really possible that such sensitive forest species had spread from the forests into developed areas? My curiosity was aroused, and I sought out historical pictures of the settlement from the town museum. By bringing together historical documents, and through an understanding of how plants are distributed now, it became clear that these ancient woodland species were primarily found where an overgrown embankment had stood in the early urban development. This discovery was only the beginning of a deeper botanical-historical investigation into the hidden traces of garden history to be found in current vegetation patterns.³

What kind of clues might we look for? To begin with, urban vegetation is known to be highly adaptive to rapid transitions in the urban environment. However, another feature of vegetation that is often neglected in an urban context is its persistence in adapting to land use change. Frequently, some components of plant communities that were adapted to previous land uses will persist even decades after the land use has changed. In addition, species that have escaped from horticultural cultivation by spreading out into adjacent vegetation can survive for a long time in certain plant communities, even if the original plantings have long since disappeared. This tenacity of vegetation elements can lead to an accumulation of traces of the past that can be read by experienced botanists. This was first demonstrated in studies on the vegetation of historical parks, where "feral" ornamental plants from previous eras can still be found in old meadows, perennial borders, and other vegetation, proving their high testimonial value.⁴

These traces of history include plants whose origins have a clear human cultural explanation, although their current occurrence is not intentional. Even when the original plantings have long since been replaced, some specimens can survive in the same area or nearby for decades, or even centuries. This phenomenon has been introduced into the botanical literature by Dutch botanists under the term "*Stinzenplanten*".⁵ In such cases, spontaneous vegetation documents a part of a garden's history as an "indicator with memory."

Areas of vegetation can also present evidence of the history of gardens and settlements beyond naturalized populations of ornamental plant species. Spontaneous vegetation can offer indirect evidence of garden practices, tracing the changes in open spaces over the course of their development history. The types of vegetation present in an area can depend on the form and duration of gardening activities or on certain forms of use and maintenance, and thus can be historically conditioned. The vegetation composition of historical settlements can therefore be read as a clue to the degree of care practised over decades, such as the infrequent mowing of meadows.⁶ In such cases, the spontaneous vegetation itself represents a historical document that should be included in conservation efforts when a settlement is recognized as protected according to monument or heritage protection laws. Plant species that are dependent on long development periods and continuous forms of use or maintenance can also be used to determine dates in the inventory of historical open spaces, and thus supplement archival research. In the case of several settlements, it has been shown that certain species are bound to residential quarters of different ages.⁷ Existing vegetation can lead to a more complete picture of garden history, especially in connection with written or pictorial sources.

A further group of vegetation elements that provide a historical testimony are the remnants of the original vegetation that have been carefully integrated into newly created gardens or settlements, which thus indicate the long-lasting history of a site. As long as the intensity of urban use has not led to a complete change of species, relic occurrences of plants can indicate historical patterns of use. Plants that are typical of agricultural landscapes or forests, and that do not have the ability to spread widely, for example, often indicate the earlier uses of their present settlement sites. In the ecological literature, these relics are often referred to as a result of land use legacies, i.e. the legacy of a former land use that is still visible in the current vegetation.⁸

Does the vegetation of open spaces within developed areas represent a historical document that makes the history of their origin and development legible, in a similar manner to what we see in historical gardens? This question has barely been investigated at all in the context of settlements listed as protected monuments, where expert assessments of the significance of vegetation are mostly limited to an inventory of planted trees and shrubs. Results from urban ecological research indicate that the suitability of spontaneous vegetation as a historical document, especially for landscape gardens, can in principle be transferred to open spaces in settlement areas.⁹

The meadows in front of the houses are an unusual design element of the *Heimstättensiedlung*. With a few exceptions they determine the appearance of the front garden. The meadows are the only vegetative cladding on the generous embankments in front of the apartment buildings. This type of greening was obviously intended to require little maintenance at the outset. This was made clear in a statement by the *Heimstätten* housing cooperative to the State Tax Office, in response to an attempt to revoke its non-profit status by reason of the high expenditure on horticulture in 1933: "The front gardens and grounds are the natural additions to the dwelling and form the natural decoration of the estate, which makes living in the estate healthier and gives the residents joy and love of nature. The complexes are not luxury gardens. The preservation of the gardens will not amount to more than about RM 2000 in the future, since the facilities are so simple that the maintenance costs can be kept to a minimum."

Photographs from the founding period of the settlement illustrate the height of the vegetation in the meadows, indicating that the front gardens were maintained relatively lightly even in the first years after their construction. Until the fall of the Berlin



Embankment in front of the houses of the first construction phase around 1919. The historical record proves that extensive meadow maintenance was already practised in the front gardens during the founding period of the settlement.

Source: Jena City Museum.

Wall in 1989, all meadows that were not assigned to single-family houses were maintained by cooperative gardeners. According to residents, mowing was carried out with the scythe until then. Lawn-like care was thus excluded at the outset. This maintenance, when practised over decades, results in a species-richness for meadows that is unusually high for human settlements. The species composition corresponds roughly to that of lean agricultural meadows. As time passes, the sites became increasingly nutrient-poor due to the continuous removal of the mown material and the simultaneous lack of fertilization. Over the long development period, the vegetation adapts to the site conditions of the different meadows in a very differentiated way, so that variations in shading or soil moisture are expressed in different species combinations.

The third example illustrates how differentiations below the species level can be helpful in obtaining valuable information on the historical use of plants. In the first construction phase of the *Heimstättensiedlung* in particular, wooden trellises were attached to the front sides of the houses, which were planted with pears shortly after construction. According to older residents, the planting material came from the cooperative nursery. This was privately managed on a specially designated site on the edge of the settlement, and was closely linked to the garden history of the settlement until its dissolution in the 1960s. According to residents (and also deduced from the trunk size of the trees), most of the espalier pears can be dated to the time when the settlement was founded. A determination of the still-existing pear varieties resulted in an unexpectedly high diversity of historical pears. More than half of the pears are very rare regional varieties, which are hardly available commercially anymore and only rarely occur in the numerous orchards surrounding the city. The preservation of this range of varieties is not just important for the protection of rare cultivated plants. It is also a testament to the self-sufficiency concept of the Garden City movement, and the special form of organization of plant procurement in this specific settlement.

The *Heimstättensiedlung* shows in an exemplary manner how historical processes, and the precise development of open spaces can be determined through a study of their vegetation. A prerequisite for this is a lengthy age and a long continuity of similar uses. The redevelopment of the existing buildings and the outside facilities of the *Heimstättensiedlung*, which began in 1996, represents a break in the decades of development continuity for the vegetation.

Protective measures are indeed being taken for the woods. The renovation of the building foundations, however, requires excavations that usually destroy a large part of the front garden vegetation. After the damage caused by the renovation work, the meadows are largely dug up and then sown again. In addition, the particularly valuable old trellises cannot be preserved due to the subsequent external insulation of the façades.

After German reunification, the traditionally minimal care of the meadows and hedges also changed. Maintenance services are now carried out by external caretakers. Meadow mowing takes place at shorter intervals and, with four to five cuts per year, reaches a frequency at which many of the higher-growing meadow



Koromandel (southern sheet).
Atlas map by D'Anville, re-issued
by Franz Anton Schraembl, 1800.
Source: David Rumsey Historical
Map Collection.

An old "choultry" at Ennur,
near Madras, 1786.
Copyright: British Library.



For a long time now, waterscapes like this have been treated as swampy waste, as receptacles of garbage, and as a site to which we banish those we refuse to house. We value water only when it is bottled, stored, piped, or pumped, and we can control it and sell it. However, waterscapes like Ennore are difficult to own. They disappear seasonally, and they defy legal categories because they appear in many interconnected forms such as marshes, floodplains, and ponds. The wrong sluice gate or a wrongly placed wall or culvert brings floodwaters swirling into homes. As the citizens of Chennai know too well from the 2015 floods, small shifts in gradient can make a huge difference to water levels.



Disused Lock, VLC Bridge, Ennore (2017). Photo: Bhavani Raman.

Tamil Nadu's coast is dotted with small blue boards. The raging battle with nature in the city's backyard is in effect part of a war being waged all along India's coasts. How has this landscape come to be, and what imaginaries does it disclose?

The shifting landforms of Ennore integrate features made by ebbing tides, gently flowing rivers, and humans—fishers, salt workers, crabbers, gatherers, and pickers of all kinds who enjoy “use rights” to the waters and its shores. These activities, and hence this landscape, have historically been managed by the conventions of *poramboke*, a Tamil term denoting land that is uncultivated, unassessed, or otherwise not privately owned. Arrangements of usufruct dominate *poramboke*, and are often a point of intense power struggle.

Ennore's salt and fish workers were here before the British canals arrived. An eighteenth-century European map sketches the creeks and settlements on the Madras coast, and locates “Enur” between the sea and the small, unmarked rivers that make up the Kosasthalaiyar drainage system.

About 30 years later, in 1786, the boats and water of Ennore reappeared as a setting for a colonial landscape painting. A painting in the Colin Mackenzie Collection held by the British Library portrays Ennore with the obligatory ruined “choultry,” a traveller's rest house, surrounded by trees, glistening waterways, and busy boats. The depiction of Ennore as a place of transit anticipated public works improvements along these *poramboke* watercourses. The British cut new canals and deepened channels to link the backwaters with Pulicat Lake. Boats carried salt from Ennore to faraway Calcutta and Chittagong. Like other manmade plans and imagined futures, this too had a shelf life. Railway lines crossed the creek. From the 1960s, the canal economy dwindled.



Where the salt and freshwater meet, Ennore (2017).
Photo: Bhavani Raman.



Treelines, Ennore (2017). Photo: Bhavani Raman.

The ambit of those who lived with the wetlands is shrinking fast. Roads cut across the water and culverts squeeze flows to rivulets. Tree lines that once marked the boundaries of small fields and let the waters move now lie behind stonewalls. There is no planting.

But those who continue to live here resolutely make life, refusing to yield to the imagination that deems the wetlands to be waste. With no salt to work, no water, no land to maintain or fish to sell, kitchen gardens thrive in *kuruvimēdu* painstakingly handwatered by water brought by tanks and pipes.

Aloe is grown in broken plastic water pots. Jasmine winds over trellises made of salvaged wood and metal. Clothes are hung on lines of leftover wire propped by fallen branches.



Kuruvimedu, Ennore (2017). Photo: Bhavani Raman.

Our fate lies with the fate of the creek and that of the users, keepers, and makers of Ennore's place-words. Our language and our gaze make them invisible to us. As long as we refuse to acknowledge this battle of imaginations, our future also hangs in the balance. As we deplete the ability to denote and imagine particular aspects of our places, to see and hear the wetlands as they call from the canals and the nullahs in our cities, to recognize ways of making life in what we dismiss as waste, we deplete our ability to imagine a different future. The disappearing Ennore creek marks a crisis in our imagination.

- 1 A version of this essay first appeared in *The Wire* in November 2017.
- 2 "RTI reveals Chennai's largest estuary Ennore Creek missing in the latest CRZ map," *DNA India* 22 July 2017, see <https://www.dnaindia.com/india/report-rti-reveals-chennai-s-largest-estuary-ennore-creek-missing-in-the-latest-crz-map-2510179> (accessed 30 September 2019).
- 3 "Illegal map used to clear port plan in Ennore creek," *The New Indian Express* 25 July 2017, see <http://www.newindianexpress.com/states/tamil-nadu/2017/jul/25/illegal-map-used-to-clear-port-plan-in-ennore-creek-1633204.html> (accessed 30 September 2019).
- 4 "A Venice that no longer is: remembering the canals of north Madras," *The Hindu* 29 August 2017 <https://www.thehindu.com/news/cities/chennai/a-venice-that-no-longer-is-remembering-the-canals-of-north-madras/article19577538.ece> (accessed 30 September 2019).
- 5 Kapilar, *Nattrinai* 292, M. L. Thangappa, *Love stands alone* (2010) p. 78.

watercourses, palaeochannels and springs" on the Iberian peninsula.¹¹ This description matches the landscape of Matinha. In addition to the palm tree in the garden, younger *Phoenix canariensis* would later be planted around some of the gasworks buildings, where the ground is susceptible to flooding. In these conditions, the naturalized *Phoenix canariensis* was able to spread among the new ecologies of these sites in which native and exotic species sprout side by side. However, it was not until the 1990s, when production stopped and demolitions started, that its wild spread in the gasworks site was made possible.

The predilection for palm trees in urban projects in Lisbon persevered past the end of the colonial empire in 1974. In 1998, Lisbon held the World Expo. The theme was "The Ocean." The event was largely a way to reframe the Portuguese expansion in a post-colonial context, by highlighting the economic, technical, and scientific achievements of Portuguese discoveries and expansion, instead of issues related to colonization, extraction, and slavery. Lisbon's largest urban development project in the democratic period—the Parque das Nações—resulted from the reconversion of the event area. Although the public space project emphasized native tree



An avenue of *Phoenix canariensis* at the Campo Grande garden (Lisbon) in the early twentieth century.
Source: Arquivo Municipal de Lisboa.

species of the genera *Quercus* and *Pinea*, some areas devoted to the theme of the Portuguese discoveries also contained several types of tropical and Mediterranean palm trees, including *Phoenix canariensis*.¹² After the Parque das Nações project was concluded, the Matinha site was deactivated; it was supposed to be the next large urban reconversion area, but lack of investment hindered the project. The abandoned and devastated landscape of the site, however, has provided a prime location for the *Phoenix canariensis* to spread. The site was very quickly covered by wild vegetation, which attracts many birds to this placid landscape. *Phoenix canariensis* spreads by means of seeds, which are disseminated by the birds that pick up the dates and move them to other parts of the site. Additionally, the colluviums and dry ravines of the site provide excellent conditions for the sprouting of new individuals. Without human intervention, *Phoenix canariensis* participated in the creation of new ecologies and new atmospheres of wildness and abandonment in which native and exotic species sprout side by side.

While new individuals sprouted across the site, the oldest palm tree started to die. Like many others in Lisbon, including emblematic specimens in botanic gardens, historical gardens, and main avenues, it was affected by the arrival of an Asian weevil to the Iberian Peninsula during the 1990s, a consequence of the increasingly intensive and globalized plant trade. This weevil is *Rhynchophorus ferrugineus*, commonly known as the red palm weevil, from the *Curculionoidea* superfamily and the *Dryophthorinae* subgroup. It has been considered a *Cocos nucifera* (coconut tree) pest since the beginning of the twentieth century in its native area, which is monsoon Asia, ranging from India to the Philippines. It was also reported in the Mesopotamian region in 1920. However, it was not until the 1970s that it rapidly spread to other geographies, where it has plagued coconut trees but also other palm trees.

The species was first reported in Japan in 1975. In the late 1980s, it was reported in several countries in the Middle East. In this region, it mainly affected *Phoenix dactylifera*, the date palm tree, which is an important agricultural species. Later, in 1994, it was reported in Spain. The species was most likely introduced into Spain through the importation of the ornamental *Phoenix canariensis* and *Phoenix dactylifera*, which were in great demand throughout Southern Europe. Between 1999 and 2011, the species had spread to most countries of the Mediterranean, and it has been found in farther sites such as the Caribbean, China, and Australia. The species spread slowly in the north Mediterranean until 2004, but since then its expansion has been remarkable.¹³ The species was first reported in the south of Portugal in 2007 and it has since spread to the whole country.¹⁴ *Rhynchophorus ferrugineus* became a regulated quarantined pest in the European Union in the same year, which means it was acknowledged as a pest in some member states and that measures to control its spread were enforced. Since then, palm trees have been subject to strict regulations regarding importation and commercialization.¹⁵

Most host plants of *Rhynchophorus ferrugineus* belong to the palm tree subfamilies *Arecoideae* and *Coryphoideae*, but the weevil has also been reported in species other than palm trees such as *Agave americana* (American aloe) or *Saccharum*

are still ignored. Viewed from this subaltern basis of reasoning, the award ceremony was *also* a way of disciplining subaltern agency, enrolling an environmentalist of colour within an established configuration of how to handle the environment while excluding his wider social and political motivations and reasoning. This is how the settler public sphere operates.

My second story (from a couple of years after the award ceremony): in a full-page advert that depicted sad faces painted at the end of logged pine trees, the “Shout for Shade” group entered the Capetonian public sphere in 2010, as part of the debate on whether to chop down pine and gum trees or to rehabilitate fynbos shrub vegetation at the Cecilia Forest on Table Mountain.²⁴ Pouring out their discontent with how they had been treated by conservation biologists employed by the South African National Biodiversity Institute (SANBI) at Kirstenbosch (or the “fynbos fanatics” as they were nicknamed by the campaign), the advert helped to create an image of two groups at loggerheads in their opinion of what was of value at Cecilia: trees for shade, or fynbos for biodiversity, and whether the site was to be called a “forest” or a “park.”

Although the advert to some extent caricatured the conflict that had been ongoing for years, it provides another aspect of how the settler public sphere travels as a remnant within botanical and environmental knowledge. While on the surface it can be seen as a heated dispute over the use of mountain land for *these* plants in preference to *those* (apparently aligning Kelvin with the “fynbos fanatics”), it also constitutes the staging of privilege, which makes plants, both indigenous fynbos and “alien” trees, into props. In this case, the love for trees can be explained by the establishment of forest plantations between 1884 and 1902, with Cecilia being one of the last remaining plantations.²⁵ This included roads and “zigzag cross-paths-cum-firebreaks” making the mountain and the growing forests on its lower reaches accessible to a wider white elite and middle class who used it for leisure hikes, dog walks, and horse riding.²⁶ Growing up and using these forests over generations, exclusively surrounded by wealthy areas classified whites-only under apartheid, forged a strong sense of place between elites and the trees, which fynbos conservationists at SANBI now had to contend with. With verbal tirades that framed “a bureaucratic minority [referring to the Table Mountain National Park and conservation botanists] as imposing their will on the majority of the public [those supporting trees for shade],” the high-octane dispute peaked in 2011 in leading newspapers, local magazines, and social forums (but was back again in 2016) and with the mayor of Cape Town weighing in to settle it through a public participation process.²⁷ The outcome in 2011 was that most of the (“alien”) trees in a 600-hectare area were allowed to be felled by commercial companies, but a “transition area” with non-invasive pine and indigenous Afro-montane trees to provide shade was introduced, covering only 8 percent of the area.²⁸

The important thing here is how this dispute lays open another enduring aspect of the settler public sphere, and how botanical knowledge plays a clear role in its constitution. From an oblique view, what is *not* important are the plants and the associated arguments and counter-arguments, but rather the stage that this



Workers taking a rest at Kirstenbosch Botanical Gardens in February 2015.
Photo (cropped) taken from the film *One Table Two Elephants* (Von Heland and Ernstson 2018). Photo: Johan von Reybekiel.



Image of felled trees at Cecilia Forest/Park, which lies close to Constantia Nek on Rhodes Drive, Cape Town. The image was published as part of a media campaign with the attached message "It's too late to cry about the trees. It's time to shout for shade." Published as an advert (cropped) in *Cape Times*, 11 March 2011.

Ailanthus altissima, or the botanical afterlives of European power

Bettina Stoetzer

The forest stood there, green, next to the ruins.

Ursula le Guin¹

Take a walk along a city's paved arteries and stumble across a botany of concrete. Look for cracks in the sidewalk, the thin gaps in-between the iron rods of gutters, the dry, gravelly soil of abandoned lots, the seams along the edges of buildings, or spaces along the road and train tracks. In the fissures of the city's built structures, nestled between slabs of concrete, you will find a world full of surprise. And if you are lucky, you will catch a glimpse of a small tree pushing its way through the concrete, breaking its surface, reaching skyward. Its dark green, palm-like leaves gently brush up against a wall. Follow the tree, and it will tell you a history of the world that is more than human.

This tree is called *Ailanthus altissima*, or tree of heaven in English. In Chinese, its name is ch'un-shu, which means "stinking or spring tree." For *Ailanthus*, becoming urban is closely linked to the history of empire, industrialization, and climate change. A fugitive for eighteenth-century European gardens and their orientalist legacies, it is a testament to the unruly lives that have persisted in the cracks of cultivation, domestication and imperial power for centuries. While often dormant or invisible, these fugitives continue to assert their presence. And they show us that Europe's cultivated landscapes, including its cities, have always been more than what humans wanted them to be.

For the purpose of this essay, let me take *Ailanthus altissima*'s roots and routes as a guide. With their unique suckering abilities, the tree's roots, once cut, quickly grow back and are able to thrive in anthropogenic and seemingly inhospitable environments. Considered both a noxious weed and a wondrous example of resilience in the city, *Ailanthus* convey stories about the entanglements between people, plants, and urban infrastructure. Tracing their intertwined routes and roots, I ask: in what ways might critical engagements with the botany of cities require cultural analysts to do more than simply rethink urban life beyond the human? In other words, how can we methodologically approach the complex and enduring processes of

exclusion, violence, and ruination—as well as the seeds for their transgression—embedded in the very ecology of Europe’s urban environments today?

A deciduous tree, *Ailanthus* is considered to be native to Northeast and Central China, to Taiwan, and to North Vietnam. With a long winter dormancy, the tree signals the beginning of spring. Its bark and leaves have been widely used for medical purposes—as astringents and to cure various ailments, including depression, baldness, stomach upset, or skin irritations. Attracting honeybees, its honey has a nutty flavor.²

According to botanical storytelling, the tree made its first appearance in Europe in 1740, when Pierre d’Incarville, a Jesuit priest who had received a botanical education in the Jardin Royale des Plantes in Paris, shipped its seeds from Beijing to Paris.³ Soon they were sown in apothecary and botanical gardens, and they also made it to London a few years later. These early travels of *Ailanthus* occurred at the height of “chinoiserie” and its orientalist fascinations—at a time when Europeans were increasingly becoming interested in plants from throughout Eastern Asia. Faring well in warmer climates, these plants, so was the hope, would aid Europeans economically as they cultivated landscapes in the colonies. At a historical moment when Chinese imperial power was in decline, and Europeans were consolidating their colonial expansion in the Americas, *Ailanthus* thus helped shape Europe’s “imperial landscapes,”⁴ in the metropole and colony alike: they adorned English and French gardens, such as Le Jardin de Plantes in Paris and the Chelsea Physic Garden⁵ as well as cities and colonial plantations in the Americas—thus providing the seeds for materializing European cultural and economic hegemony at home and abroad. In this sense, they are part of a larger trend of what Jill Casid has called “imperial landscaping practices”—the making of everything from plantations to cities to island gardens during the eighteenth and nineteenth centuries, when the global circulation of seeds and plants both symbolized and materialized imperial power.⁶

In 1784, when the tree made it to the Americas via the Philadelphia gardener William Hamilton, it was accompanied by the Shantung silk moth, *Attacus cynthis*. In fact, trees of heaven were intermittently used in silk production in North America as well as in Europe, as they had previously been in China (the so-called Shantung silk is more coarse and durable than other silks, and also does not dye).⁷ Praised for their beautiful foliage and exotic appearance, as well as their rapid growth and resilience vis-à-vis smoke, pollution, drought and even a large number of herbivorous insects,⁸ trees of heaven appeared widely as ornamental street trees throughout Europe and the Americas. They lined city promenades in France and Italy, as well as streets in Boston, New York, and Philadelphia, and they could also be found at the edges of plantations in the Southern United States.⁹ In Europe, they were increasingly used for wood production and as a buffer against erosion and wind,¹⁰ thus assisting urbanization and the fortification of transportation infrastructure.¹¹

Trees of heaven thus became associated with cities—although, curiously, in China, they mainly appeared in rural areas. This was due to different European pruning techniques and the ubiquity of urban gleaners in Chinese cities.¹² In contrast, in



Winter balcony (2019). Photo: Dorothee Brantz.

In Berlin, March and April are transient times because both types of seasonal balconies persist. On many balconies, pine twigs still dominate, while on others pansies, narcissi, and hyacinths are already in bloom. No pelargoniums and petunias yet. They are too sensitive to frost, which could still return at any time in early spring. The garden centres are slowly filling up their outdoor spaces with plants as customers grow ever more eager to purchase flower boxes, dirt, and all kinds of flowery and green plants. Early spring weekends are among the busiest times of year for home supply stores. Garden centres have long been highly commercialized spaces of an astounding eco-globality in the midst of cities. Here one can purchase plants from all over the world. Japanese cherries stand next to

Mediterranean olive trees, boxwoods next to citrus plants. Oleanders are lined up next to rose bushes of all kinds. These days, there are also a growing number of specially-bred miniature fruit trees. All of them end up on balconies across the city. Spring holds the promise of a summer harvest—of urban agriculture in miniature. After all, balconies embody the philosophy of the “edible city.” Often, they are described as a private oasis amidst the bustle of the urban or as a little paradise and safe haven in times of planetary demise. Very likely, this is just an illusion. We will see when spring turns to summer. If 2020 turns into another European summer of drought, what will happen to the city’s planted balconies? Will they become another site of drought, or will they attest to the excessive use of water? Both would present problematic sights, and sad signs of our changing environmental and political climate.

In a recent shift towards a more phenomenological perspective on the corporeal and sensory dimensions of cities, scholars are looking at the complexity of urban atmospheres to uncover the prevailing mood or cultural representations of a place. Matthew Gandy writes that atmospheres of this kind always connect to “a persistent material or meteorological presence, either real or imagined, which envelopes or unsettles the human subject.”⁶ Balconies embody the transitory nature of urban atmospheres and how they affect various living creatures. Walter Benjamin called his loggia a protected place where time and place melted together, where impressions of life amalgamated and where life slowed down to a sense of *carpe diem*.⁷ Balcony life is not just about *carpe diem*, but it encapsulates numerous temporal dimensions such as time of day, seasonal time of year, memory, and history. It embodies change and continuity, both of which are exemplified in the lifecycle of plants that blossom, bloom, and wilt to reemerge the following year (if they are frost-resistant). Plants also participate in historical processes through their continuous existence either as individual plants, in their persistent succession (such as roses and pelargoniums), or in their distinct presence at specific historical moments (consider vegetables in the immediate post-war years or miniature fruit trees today). Recognizing the whole urban temporal spectrum opens up a deep perspective on the botanical city—both in specific geographic (climatic) locations and with regard to species diversity. The balcony offers a stage where these urban atmospheric distinctions manifest themselves. This is not only a matter of perceptions and impressions; it also translates into a profit margin. If one is to believe real estate advertisements, a balcony oriented towards the sun contributes substantially to the monetary value of an apartment. In Berlin, a south-facing balcony is by far the most desirable because it provides the largest amount of sunshine while the north-facing balconies are considered the least attractive option. The existence and size of balconies as well as their sun exposure are important factors in determining real estate values, but not simply as a matter of hype.

Alignment towards the light matters with regard to sun exposure, which in turn has a direct effect on what can be planted. Plants, as we know, influence the atmosphere of a place, not just with regard to human leisure but also with regard to its ecology—which plants will grow, which birds and insects might come to visit



Former drying site, Blackheath, London (2017). Photo: Marcus Nyman

or to provide another pair of eyes to spot something novel and as yet unnoticed. I had by this point become somewhat accustomed to the peculiar rhythms and embodiments of this form of botanical surveying. When the focus is species occurrence—rather than, say, abundance or richness—walks tend to move only a little in the first hour or so. As the more common species are noted down, their occurrence later on in the route becomes incidental and the overall pace increases. And yet urban landscapes are far from smooth, and a stop-start pattern is only further complicated by disrupted and fractured terrain. This is not so much a question of the physical capacity to traverse city spaces (although in some cases, soil, rubble, and detritus can present precarious footing³), but the form and focus of a survey concerned with wild and self-sown plants offers a re-reading of such spaces. This form of surveying is atlas-based. It divides an area of interest—in this case the whole of Greater London—into grid reference squares, and surveys each of these for the number of species occurring within each of them (on several different occasions). It constitutes a “transect” inasmuch as it is based around a linear, walked

route rather than making use of quadrats, but it is not itself a form of representative sampling.⁴ Routes are largely dictated by the local knowledge and experience of the meeting leader and by connecting the spaces in which one would be most likely to encounter wild plants, rather than their domesticated and cultivated cousins. Although selectively walked routes may well confer certain biases,⁵ urban environments, with their mosaic-like landscapes, do not provide smooth, unimpeded terrain upon which to record. It is estimated that around 24 percent of Greater London is private, domestic garden.⁶ While typically populated by cultivated species, these gardens are also locations in which the wild and the self-sown thrive. And yet domestic gardens are beyond the practicable purview of this kind of survey. Although classically, a transect—as a rigorous sampling method—can be useful for assessing species change across different land types and zones of transition, such transects would likely prove unfeasible and inappropriate for surveying the variegated landscapes of a city such as London, at this scale.

We worked our way back westward through the car park, parallel to the railway, noting down as we went not the ornamental or monumental but the bit-part vegetal players, growing from cracks in the pavement, occupying the edges of paths, and encroaching on otherwise carefully managed spaces. The back fences of the gardens we passed and the presence of tomato plants (*Solanum lycopersicum*) hinted at the possibilities of botanical escape that urban density and diversity engender—an unintended invitation for plants to cross human-imposed boundaries. We squeeze between cars and brush past oddly-shaped alkanet (*Pentaglottis sempervirens*) reaching out from the loosely-soiled pavement edges and the base of trees, while discarded bedsprings offer an improvised growing frame. Meanwhile, woody nightshade (*Solanum dulcamara*) makes use of chain-linked fencing for support in its circuitous growth upwards, catching the tree-dappled light on its crimson-red berries. Blackheath is a largely affluent neighbourhood, approximately ten kilometres southeast from the centre of London. Once a suburb *proper*, the city's urban expansion has long since engulfed everything but the Heath itself. Like many such areas of London, despite its sometimes grand architecture and obvious wealth, Blackheath contains pockets of public housing, and it is contiguous with areas such as Charlton and Woolwich to the north, Lewisham to the west and Kidbrooke to the east, that contain higher levels of socio-economical disadvantage. The somewhat anarchic growth of the city did not always leave room for the strict segregation of the rich from the poor. The railway arrived here in the 1840s, linking the metropolis with this newly sprung-up suburb lining the southern edges of the sizeable expanse of common land known as Blackheath. Heading east, the railway continues to the Thames estuary, the Medway, and the north Kent coast. As local historian Neil Rhind points out, unlike many of the ancient villages ultimately subsumed in the expansion of London, Blackheath village was not especially old. Indeed, “it was never, in the true sense, a village at all, for when it finally came into being it was sited at the meeting point of four parishes.”⁷ Like many extant areas of metropolitan common land, the semi-rural vistas that the heath afforded the owners of its large new

Botanizing the asphalt



Part
2

Maria Thereza Alves: *Wake for Berlin* (1999–2001) (detail). Photo: Maria Thereza Alves.



topsoil can include “similar species in many places.”⁸ Carefully following this advice, Alves’s research on the seventeen sites resulted in a 400-page document containing not just the botanical drawings of the plants that did germinate—and of others found on the site—but also a large assortment of historical documents, including photographs, photocopies of botanical treatises, personal annotations, and records of exchanges with various botanists and ecologists.⁹ The richness and scope of these materials is truly striking, even if, as I suggest above, they simultaneously perform the act of historical investigation and disavow it by treating each finding as a “found object” or “text” to be rapidly stripped of its references—i.e. to be decontextualized and treated as an index of a larger narrative of a globalizing colonialism.

In the important boulevard Unter den Linden (German for “under the linden trees”), which runs from the City Palace to the Brandenburg Gate in Mitte, Alves collected

a soil sample 2.7 metres below street level, where a hole had been dug out in order to do some piping work. The artist was drawn to this site by its immediate relationship with the history of war, given the inevitable crossing of the Brandenburg Gate by marching soldiers—those who travelled to conquer, and those returning from victory or defeat. In recalling some of these wars, Alves mentions Napoleon's multi-national army of one million soldiers (coming from Poland, Sweden, the Netherlands, Prussia, and France), a section of which were garrisoned in Berlin on their way to Russia in 1812. She also recalls their return to Berlin after their colossal defeat, having first crossed the Berezina and Neman Rivers into Poland. In moments of triumph and celebration, Unter den Linden was decorated with greenery, including the symbolic laurel and oak wreaths, and was also filled with celebratory flowers presented by women along the routes. Alves identifies species of all these provenances and varieties as potentially located in the site's seed bank, together with seeds brought to Berlin as a result of international trade. She mentions, too, the increased presence of luxury goods in Unter den Linden towards the beginning of the twentieth century—with diamonds coming to Germany from Namibia “where German soldiers were stationed.”¹⁰ New varieties of flowers arrived on the site during times of protest and unrest in the 1930s, even if during the early days of his rule Hitler ordered the linden trees that had given a name to the boulevard to be cut down, only to replant them in 1936. The soft street surfacing used at that time allowed “seeds to easily settle into the seed bank.”¹¹ This policy changed in 1961, with the replacement of soft materials by concrete slabs that would seal access to the soil beneath. The potential consequence of this change in urban policy is a gradual diminution of diversity in the seed bank with the passing of time.

During her research on this site, Alves conversed with botanist Herbert Sukopp, whose work has shown that two non-native plants have become characteristic of the area: the *Sisymbrium irio*, originally from the Mediterranean, and the *Parietaria pensylvanica*, first found in the state of Pennsylvania in the United States. The former was first seen in Berlin within the confines of the Moabit Prison; so it is likely that its seeds spread via the management of soil by prison workers, and the subsequent use of this soil to plant tree saplings in the city. The second one may have spread in the mid-nineteenth century from samples brought to the botanical gardens of Schöneberg and Humboldt University. The seemingly unintentional dispersion of these plants in Berlin is significant in a context in which the acquisition and loss of plant varieties as a result of warfare was an object of botanical interest, as Alves shows in her research on another of these sites (a construction site in the corner of Charlottenstraße 33 and Französische Straße 42/44). Here, she includes among her “found documents” a photocopy of a French botanical study listing the plants lost by Germany after the annexation of Alsace-Lorraine by France in 1918—and those, in turn, gained by France. This treatment of plants as spoils of war shows how problematic the nationalist appropriations of plant species ultimately are. It also serves as a reminder of the ways in which the desire to own, appropriate, and domesticate “foreign” plants animated the colonial imagination.



Taraxacum pappus with captured airborne microfibers and dust.
Photo: Alexandra Toland, 2016. Courtesy of the artist.

creatures as well. Ecosystem services are described by the UNEP (2009) as the provisional, regulative, cultural, and supporting services provided by nature for human recipients.³ Säumel et al. (2015) discuss a number of specific examples and management strategies for ecosystem services (as well as disservices) provided by roadside vegetation in an argument for more liveable urban habitats.⁴ Dandelions, like all flowering plants in the city, contribute to some of these ecosystem services, such as providing joy to children with their seed pods (a cultural service), providing food and nesting niches for insects (a supporting service), and stabilizing the soil, shading the surface, and to some extent filtering dust (all regulating services).

To date, much research has been conducted on the dust filtration capacity of trees⁵ and herbaceous vegetation⁶ along roadsides, where the source of traffic-induced PM is at its greatest.⁷ While the filtering capacity of plants has been linked to various morphological features of leaves, such as hairy or wrinkled surfaces,⁸ there



Taraxacum models made with microfiber cleaning products.
Photo: Alexandra Toland, 2016. Courtesy of the artist.

is very little known about the filtering capacity of *flowers*. Because the presence of plant leaves, required for photosynthesis, is relatively greater than the seasonal presence of flowers, required for reproduction, and the bulk quantity of leaves exceeds that of flowers, leaf structures have been seemingly singled out for study in determining the dust filtration capacity of urban plants. The complex, three-dimensional structures of flowers, however, make them interesting allies in dust filtration. Since that fateful afternoon in August, I began to focus my attention on all the flowers, fruiting bodies, and seeds in my neighbourhood. Which species bloomed the longest? What kind of flower shapes made the best filters? Which surfaces captured the most dust? What kinds of dust were the flowers and seeds picking up? And how could the questions that are relevant to urban ecologists be investigated with artistic means? I sketched out an artistic ecology research plan, started experimenting with forms, and promised my daughter that we would have better answers come next August. With a flood of questions, tiny seeds took flight.



Installation view of *DUST BLOOMS* at the 2017 Ars Electronica Cyber Arts Exhibition (with reference to Dürer's 1503 "Great Piece of Turf").
Photo: Alexandra Toland, 2017. Courtesy of the artist.

The *DUST BLOOMS* project, which has had several iterations under several titles,⁹ is an ongoing transdisciplinary artistic research experiment in multiple parts that aims to better understand the role that roadside flowers play in making cities healthier, happier places. Using a synthesis of artistic and scientific methods, the project juxtaposes the beauty and function of urban flora to comment on the very idea of ecosystem services in cities. It is both a systematic investigation and a practice of embodied everyday curiosity. As an art project, *DUST BLOOMS* does not provide answers but rather raises questions often avoided by scientists in ESS discourse: Should plants be seen as “service providers” in a larger service society? What moral responsibilities do humans have towards plants in return for their services? Can the services provided by plants be seen as phyto-technologies in a multi-species democracy? And how can new human technologies be used to improve relationships between plants and humans under the environmental strains of the Anthropocene?

The burden of answering these questions I place upon the speechless dandelions clustered in an empty tree pit on my busy street in Kreuzberg. Consider the dandelion, with its dense radial structure (both as a flower and as a seed pod). Note the looseness of the individual achenial seeds with their hairy pappus “wings,” the length and straw-like hollowness of the stem, and the browning, curling phyllary leaves pushed downward towards the base. The dandelion speaks as a “model species” widely referenced in ecological research because of its highly adaptive



Installation view of *DUST BLOOMS* at the 2017 Ars Electronica Cyber Arts Exhibition. Photo: Alexandra Toland, 2017. Courtesy of the artist.

morphological and genetic properties.¹⁰ Dandelions can adjust their size, shape, and metabolic properties to better deal with stress factors such as being grazed in rural locations¹¹ or with pollution in urban ones.¹² Its super adaptability makes the dandelion a super-species—a complex group of species so closely related that, taxonomically, they are nearly impossible to tell apart. If in real life the morphological potentialities of the dandelion escape conclusive specification, then I am emboldened to study its likeness with different combinations of materials and compositions in order to get to know the species better. To model the dandelion is to honor 30 million years of subtle shape shifting through sculptural research. To model the dandelion is to have a conversation about the Anthropocene without spoken words.

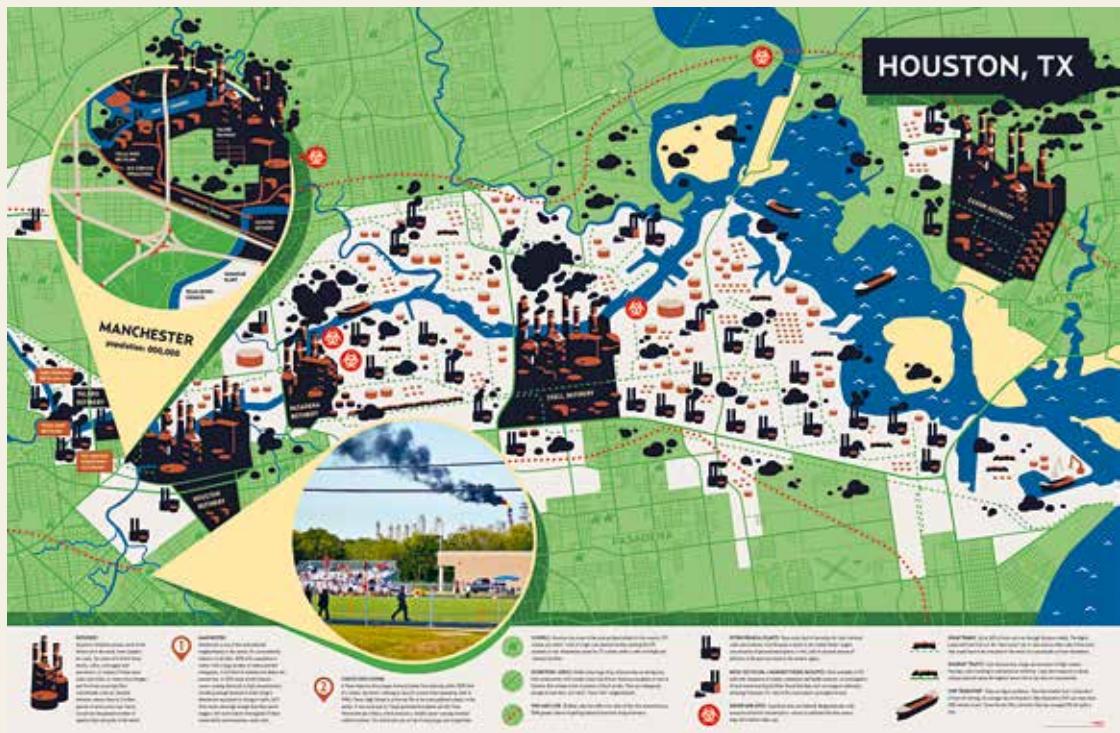
Biologist, Gerhard Scholz (2015) recognizes that “models, like all cultural objects, are reflections of their time in terms of materiality and aesthetics but also in terms of scientific knowledge, viewpoints and concepts represented.”¹³ The materials used in *DUST BLOOMS* are sourced from the very world they seek to understand. Unique inventions of consumer society—plastic dental brush-sticks, microfiber wipes, polycarbonate screws, beading wire, plastic clay, glitter, rubber bands, and granular resins—are fused together as glorified bricolage of the Anthropocene. What is in other contexts used to clean, decorate, or hold things together can be repurposed to measure environmental phenomena. Sculptural prototypes based on the morphological features of the *Taraxacum* (Dandelion) family are developed

Toxic tour: Houston's environmental apartheid and institutional liberation

T. J. Demos

Wastelands have increasingly merged with urban sacrifice zones at the frontiers of impoverishment, environmental degradation, structural racism, and police brutality, where containment is no longer fully possible—if it ever was. Still, this situation grows worse and is revealed in city areas formed at the catastrophic convergence of climate change and extreme weather, as in post-hurricane Houston, Texas. As investigated by the U.S. based artist collective Not an Alternative/The Natural History Museum, Houston offers a revealing lens on shifting conditions of resurgent urban gentrification, environmental injustice, and petrocapitalist mythology. They also propose modes of intervention that build on the intersectionalist political ecologies of contemporary art, according to which creative aesthetic sensibility conjugates social justice concerns with multispecies life and more-than-human forms of life in ways that are both critically analytical and environmentally generative.¹ In the case of Not an Alternative's *Mining the NHMS*, a mixed-media installation and social-practice project of 2016, the urban zone of Houston becomes a diorama of socio-ecological connections in which botanical formations intersect with politico-economic divisions.

Urban wastelands have long been the focus of environmental justice (EJ) movements in the United States. These emerged in the 1980s, but extend back to social movements of the 1960s that staged protests against environmental racism. One fundamental insight of EJ analyses, led by African-American concerns for in/equality in environmental health, is that communities of colour (African American, Indigenous, Hispanic), are disproportionately impacted by the urban toxicity of landfills and incinerators and corresponding lack of greenery; consequently, any justice-based solutions to waste management and urban design must take social inequality in exposure and vulnerability into account. The momentum of EJ activism initially built on the 1968 Memphis Sanitation Strike over better pay and safer working conditions, and resulted in such key publications as the 1983 congressional study on "Siting of hazardous waste landfills and their correlation with racial



Not An Alternative, *Houston's Fossil Fuel Ecosystem*, map charting Houston's geography of environmental injustice, installed as a lightbox table in the exhibition *Mining the HMNS: An Investigation by The Natural History Museum*, Project Row Houses, Houston, TX, 2016. Photo: Not An Alternative/The Natural History Museum. Courtesy of the artists.

and economic status of surrounding communities," which in turn informed the United Church of Christ's Commission for Racial Justice's 1987 study *Toxic wastes and race in the United States*, and Robert Bullard's 1990, *Dumping in Dixie: race, class, and environmental quality*.² These were generally opposed to the tendencies of white, liberal environmentalism, which, beginning in the nineteenth century, directed preservationist policies toward wilderness conservation and wildlife protection, reflecting the interests and privileges of outdoor leisure cultures shocked at the horrors of unregulated extraction, deforestation, and spread of industrial waste that were effects of colonial modernity. That trajectory continues today with the mainstream focus on greenhouse gases and atmospheric carbon. For example, the Sierra Club, founded in 1892 by Scottish-American preservationist John Muir, proclaimed its ambition in its original mission statement as follows: "To explore, enjoy, and render accessible the mountain regions of the Pacific Coast," without mentioning the fact that those lands were premised on Indigenous dispossession. It is precisely this mode of environmentalism—today, implicating the kind dedicated to the ineffectual liberal reformism of recycling and green consumerism, rather than socio-ecological justice—that Indian activist Ramachandra Guha terms the "ecology of affluence."³

utilitarian envisioning of nature? There are a number of botanical studies that simply apply the transect method directly to urban areas in order to examine the plant diversity at specific sites.¹⁴ In other cases, a more schematic approach is adopted in order to provide a cross-sectional representation of the urban-rural gradient in terms of variations in the built environment and its characteristic vegetation.¹⁵ The transect has also been adopted within some architectonic formulations as a way of depicting urban topography, or as an urban design tool, yet these approaches are invariably schematic depictions rather than a direct application of botanical method to urban space.¹⁶ More prescient, however, are those botanical surveys that have sought to directly challenge the nativist preoccupations of plant sociology and its colonial underpinnings, by emphasizing the novel socio-ecological assemblages to be found in urban space. In the hands of geographers such as Gerhard Hard, botanical methods not only enable interpretation of the unusual characteristics of urban vegetation but also become a means to interrogate the history of landscape itself, in all its ideological complexity.¹⁷

Cultural iterations of the urban transect can take several different forms. An urban transect can follow a line produced by infrastructure networks such as roads, canals, or railway lines, as reflected in projects such as the LA-based artist Ed Ruscha's series of photographs entitled *Every Building on the Sunset Strip* (1966). The simple practice of walking is also a significant motif within Land Art, exemplified by Richard Long's performance *A Line Made by Walking* (1967), which records a transitory impression left by the artist walking across a field. In some cases the transect becomes the ecology of the line itself, as in studies of plants growing in the interstitial spaces produced by transport networks such as roadside verges or railway embankments. In other examples a more conventional type of botanical transect is undertaken within a chosen site, as reflected in a variety of works by the French artist Paul-Armand Gette such as his 16-mm film entitled *Le Transect* (1974). In some instances, there is an attempt to transect space directly, as in the performance art of Simon Faithful, where in an homage to Buster Keaton, he scales fences and crawls through windows to follow the meridian line as precisely as possible in *0°0' Navigation* (2008). Similarly, Gordon Matta-Clark's intervention entitled *Splitting* (1974) sees a recently abandoned house cut in half so that the transect becomes an active sculptural intervention in urban space.

Writers have also used the transect as a way to structure a narrative around movement through space. The transect can be conceived as a Perecian literary device, serving to spur heightened forms of observation and creative reflection through the use of an artificial constraint.¹⁸ The idea of the line as a restriction on thought, or a form of conceptual rigidity, is effectively inverted to heighten the experience of space. Examples include the French writer François Bon, who describes the changing landscapes he observes on his regular commute from Nancy to Paris, or the Welsh writer Iain Sinclair's exploration of London's hinterland by tracing the route of the M25 orbital motorway.¹⁹

A botanical transect is an embodied methodology par excellence: the systematic recording of plant life involves not just training the eye to notice small details,



Richard Long, *A Line Made by Walking* (1967). Photo: Copyright Tate Gallery.

using sophisticated forms of pattern recognition, but also the use of other sensory clues such as smell to help identify specific plants, haptic interactions with leaves to explore their surface textures, and an awareness of small variations in light and shade, to produce an “incidental sensorium” that is open to the unexpected. The completion of a transect introduces a degree of “slowness” to the navigation of space that echoes Isabelle Stengers’s appeal for *ralentissement* (deceleration) in scientific practice.²⁰ Indeed, the very act of slowing down can be likened to a kind of “ecological loitering” that serves as an entry point into the nuance and complexity of urban space.

The transect also resonates with psychogeographical explorations of the modern city. And yet the situationist excursion or *dérive*, in its classic late 1960s formulation, has little grounding in ecological observations.²¹ Methodologically, the *dérive* is a highly impressionistic if not masculinist cultural trope, although we should be cautious over any essentialist form of epistemological critique. For the Paris-based writer Lauren Elkin, it is attentiveness to the shifting and often invisible contours of the “affective landscape” that marks the starting point for urban walking as a form of societal critique as well as critical reflection.²² Similarly, the geographer

Walking with plants: disrupting the material logics of *degrado* at the banks of Turin's Stura river

Lucilla Barchetta

Walking, as an everyday practice, can be considered one of the most emblematic engagements with everyday living environments—and especially with natural spaces in human settlements, which are the focus of this essay. In recent years, the interest in walking as a research topic in social sciences agendas has significantly expanded, with scholars investigating a variety of issues associated with urban space.¹ Walking has thus been framed as a methodological concern within discussions on ethnographic practice, primarily in the study of how different types of walks (functional, aesthetic, and experiential) may alter phenomenological appropriations and atmospheric experiences of space; however, scholars have also argued that encounters with the vegetal world can alter human thinking during the process of walking.²

The emergence of two bodies of research within the field of cultural studies known respectively as strollology (or promenadology) and critical plant studies confirms the renewed attention that walking has received in recent times. The Swiss architectural thinker Lucius Burckhardt was particularly bold, claiming that new design intelligence was not just embedded in everyday life but emerged from taking a stroll. The only aesthetic one can produce is strollological, he argued, for the simple reason that walking is a way in which the human body can explore and build knowledge of place, while also reaching a higher awareness of the close relationship between the human and non-human world.³

In this essay I argue that “walking with plants” in marginal urban areas can offer a means to build a collaborative laboratory of environmental change, in that it represents a transformative practice of engaging with the elusiveness that characterizes the processes of ruination in urban settlements that cause places to experience neglect or destruction.⁴

Thus, this essay explores ways of documenting the affective ecologies that connect human subjectivities and spontaneous urban flora in Turin's riverbank area,

with the aim of formulating a different language through which to capture the tenacious effects of ruins; rather than speaking of “inert remains” and “privileged sites of reflections,”⁵ this essay will focus on their agentive reconfiguration, decomposition and re-composition into the present.

Patrizia stands at the side of the gravel track that was built in 2009 along the left bank of the Stura river. Destined to become part of a river park, the edges of the Stura represent one of the gateways to the recovery and cleaning up of peripheral riverbank spaces. Rows of young maples and willows on each side of the three-km track are palpable marks of a physical intervention. Despite the inauguration of Arrivore Park in 2010, the recovery has been accompanied by difficulty in materializing a systematic project of riverfront rehabilitation. The result is the presence of tracts of riverbank spaces where intermittent developments combined with forms of controlled abandonment have occasioned a peculiar condition of temporal suspension, which is illuminated by the manifestation of peculiar configurations of “waste” and “blight” space.

Two bridges interrupt the trail and delimit a huge open space where cultivated vegetation and spontaneous riparian woods combine. The seasonal changes in the river embankments between spring and summer time have formed gentle slopes, where children and dogs play and chance upon mallards, grey herons, and crested grebes, turning the river’s edge into an interspecies playground.

Patrizia is 58 years old and lives in the Barca area, a neighbourhood located on the edge of the city, near the confluence of the Stura and Po rivers in the north-eastern periphery of Turin. As we walk along the river, she recalls how her parents always forbade her to hang out nearby the Stura area, which she remembers as an inaccessible heap of thorny plants and weeds with the remains of a sand extraction site showing along the riverbanks; it was used for the construction of a residential building area during the housing boom of the 1950s and 1960s.

Manuela, 55 years old, has joined us on the walk. Samples of pokeweed (*Phytolacca americana*), dubbed “pest species” by the river park’s gardeners, hamper her steps as she rapidly moves towards the flowers of *Robinia pseudoacacia*, a tree commonly known as the “invasive” black locust on account of its rapid growth.

Suddenly, as she loses the perception of contact with the ground, she looks down and unexpectedly finds a group of puffballs (*vescia* in Italian). They remind her of her uncle who used to harvest them there, even though nobody in his family would eat them because they came from a toxic area.

The women’s memories speak of the edges of the Stura as a political project of ruination, where territorial stigmatization, industrial pollution, negligence, and administrative mismanagement have imprinted the forms of a socio-spatial marginality, and sedimented a common perception of a no-go area.

Nevertheless, as the documentary *City Veins* suggests,⁶ the Stura edges are less an “empty space” than a “crossroads of stories”; the stories of sex workers, stray dogs, drug dealers, and consumers, together with the retired *meridionali* (as Southern migrants were called) who cultivated their vegetable gardens along the river, intersecting with migrants and refugees who—ever since the 1990s—have

as a particular atmosphere that encloses and presses upon bodies, creating the sense of a city “gone wild.”⁹

Arianna is a 37-year-old environmental educator and anti-speciesist activist who, through urban botanical explorations, experiments with the potentials of an imaginative re-interpretation of the urban space as a spontaneous and libertarian place of freedom.¹⁰

We stop, pausing to look at a lush pile of sweet wormwood (*Artemisia annua*) adjoining the gravel track. Arianna describes this annual plant as “saboteurs of order”; the scent of their leaves and their vast distribution show the forms of a “new nature,” thus disrupting normative aesthetic conventions. Weeds can also be considered to be “traces” of a biographical type, to the extent that they tell the stories of those who love and hate them. But how important is it for plants to be recognized? How does this change representations and perceptions of space? Rather than showing the potential of healing (toxic) bodies and places through wilderness, it seems that the sensual experience actuated by roaming shifts the baselines and determines the extent of change by suspending one’s anthropocentric judgments; in doing so it occasions rethinking of anthropogenic interventions in urban environments and begins to track our attentiveness and intimacy with places.

The knowledge captured in the walk can thus be compared to the practice of “informal garbage collectors”¹¹ who take an archaeological look at the convergence and divergence of both organic and inorganic materials.

As my interlocutors join their footprints with lady’s thumbs (*Persicaria maculosa*) and yellow mignonettes (*Reseda lutea*), taking the time to stop, observe, and



Encounters with lady’s thumbs (*Persicaria maculosa*), 2018. Photo: Daniele Fazio.

touch, they are doing more than simply exploring the material vitality of what would otherwise be disposed of; they also tell alternative stories that urge us to reflect on the messiness of social realities without ever reducing ruination “to an all-too-human by-product in need of rational management.”¹² Instead, they show that ruination remains within and continuously flows through bodies and the corporeal dimensions of space.

“Everything gets knotty here!” 60-year-old Fulvio exclaims, while he moves towards the thick vegetation that brings us to the river’s edge. Fulvio (Patrizia’s husband) notices that, in all of their Sunday walks on the edge of the Stura, they have never left the main path. Crafting new paths therefore not only liberates the body from the performative constraints of the city, but it also provides a way of venturing the possibilities of life processes and creating entanglements without losing the complexity of histories.

Unexpected encounters with corncobs and tomato plants remind us of once cultivated lands, which carried the seeds of Turin’s “car empire”¹³—constructed on former areas of subsistence farming—into the present. By looking at the way white bryony (*Bryonia alba*), honeysuckles (*Lonicera japonica*), tree lupin (*Lupinus arborens*) and mock strawberries (*Duchesnea indica*) expand and radiate across space, or even “roam,” according to French gardener, botanist and writer Gilles Clément,¹⁴ there emerges the possibility of interpreting the infrastructure of the city as a vegetative system where, as Andrea Brighenti writes, “the manifestation of the urban only or just takes place when the time is ripe.”¹⁵ Cities concentrate time and space in “knots,” but they also contain gaps, frictions and discontinuities.¹⁶ This is less a celebration of a romantic and universal hybridity than an acknowledgement of the messy actuality and incompleteness of everyday experiences that we, as researchers, often attempt to disentangle.

These topographical explorations approach the urban space as a temporal horizon by aligning with multiple time-spaces and highlighting the way that temporal sedimentations of ruination can be observed through a sensing, rather than a mastering. This dimension is central to an understanding of the uses of *degrado*, especially in the Italian context. *Degrado* is an aesthetic problem that is solved at the level of perceptions towards urban spaces and the bodies that grow in the midst of them. Feelings of disgust and waste spread across the city (the city stinks!), and people also feel abandoned. What does ruination do? How do bodies live with it? How does one describe these phenomenological and atmospheric encounters? The future of ethnographic enquiry has to engage with these questions.

We end the walk by roaming the dried up riverbanks, finding a buried car lying near a sample of *Verbascum thapsus*, known as the great mullein. Daniele is a 45-year-old agronomist, very passionate about learning how plants can help connect fragments of stories to socio-ecological transformations. After foraging information in his plant identification notebook, he recalls how people used to extract a juice from the seeds of the plant, which they then poured into the water in order to poison fish and thus catch them more easily. Patrizia, Daniele, Manuela, Fulvio, and I found ourselves surrounding this plant and wondering to what extent these



A view of the General Store in the Lahore Railway Yards, 2017. Photo: Nida Rehman.

influenced horticultural pursuits and ornamental gardening through its centrally located garden, featuring didactic displays, plant and flower shows, and a nursery.⁶ Post-colonial and contemporary urban development and planning in Lahore have continued to narrowly privilege urban nature practices steeped in historicist rehearsals of the Mughal “city of gardens” and colonial horticultural aesthetics. Today, a preference for water-intensive and exotic trees and flora, highly manicured lawns, and ornamental shrubs is apparent in private elite gardens. Meanwhile, urban managers deploy monocultural planting of economically expedient (and profitable) species such as *Conocarpus* or date palms for urban “beautification” along the city’s main arteries and public areas. As rapid urbanization and the expansion of the built environment have decimated swaths of urban forest cover, imported and ornamental species have largely replaced mature, shade-giving trees, contributing to a crisis of deteriorating air quality.⁷ The resultant urban landscape exemplifies the unequal and stratified geographies of class in relation to the environmental politics of post-colonial South Asian cities. For instance, the presence of tree cover and access to open areas is far greater in central and suburban elite neighbourhoods than in denser working-class areas, while the health risks of atmospheric pollution are unevenly distributed, disproportionately affecting those who lack access to air-conditioned private spaces and automobiles.⁸

Conversely, concerned citizens and environmental groups decry the use of exotic and invasive species. “Every alien eucalyptus is a tube well, drinking up our precious groundwater,” laments Salman Rashid, a prominent columnist and activist, speaking about a much-reviled tree⁹ introduced and acclimatized over a hundred years ago for its economic value (and a nineteenth-century belief in its power to “absorb swamps and destroy malaria”).¹⁰ Similarly, the presence of invasive species such as mesquite, lantana, and parthenium in wasteland and other neglected

sites like cemeteries is a source of concern for ecologists. In recent years, research efforts have focused on the conservation and restoration of native, drought-tolerant plant species.¹¹ However, discourses privileging the revival of native ecosystems do not account for the historically and culturally constituted diversification of urban landscapes, the impossibility of “turning back the ecological clock,” and, notably, the socio-ecological possibilities of cosmopolitan and novel ecosystems,¹² such as those present in Lahore’s railway yards.

Despite its proximity to the historic centre of the city, its dense residential communities, and some of the city’s busiest arteries (such as the Canal Bank Road and the Grand Trunk Road), the Mughalpura railway land is effectively invisible to and inaccessible from the city, hidden behind tall boundary walls and guarded entrances. In contrast to both the “beautified” and denuded aspects of the urban environment outside the walls, nature operates here outside the limits circumscribed by urban management, while being thoroughly bound up in human-dominated processes over the course of the site’s more than hundred-year industrial history.

While the complex ecologies of the railway yards, their industrial uses and toxicities, and their largely neglected status in terms of public perception present interesting overlaps with those of the marginal urban landscapes discussed in literature focused on wastelands and post-industrial sites in the global north, they also raise certain conceptual challenges, and suggest avenues for further research. For instance, urban ecology and landscape design literature on wastelands or “terrain vague” has frequently highlighted their associations with emptiness and lack of productivity. On the one hand, these associations of vacancy and devaluation can be propagated by or co-opted into processes of urban development or land seizure.¹³ Conversely, in being “mentally exterior” to the city, wasteland or other marginal spaces also lend themselves to counter-narratives of freedom and play, where the limits of propriety and behaviour normally established in managed landscapes and parks may be transgressed (if only momentarily), giving way to more ambivalent encounters.¹⁴ However, the spaces of “old urban nature” in Global South cities, such as the railway yards in Lahore, index distinct political ecologies and functional dynamics.¹⁵ As an active and controlled landscape of production within an established institutional purview, the railway yards are not (at least at the moment) subject to development pressure, but they are also highly securitized and enclosed. Here, even the more remote areas are actively policed, and access is restricted, as I learnt one morning when our group was stopped and interrogated by a guard patrolling the storage yards. While institutional controls and security of this type may help maintain the state of neglect towards urban nature through protection against urbanization, they also restrict possibilities for public use or informal appropriation. Freedom for trees and weeds to do their own thing does not seem to translate as readily into similar possibilities for people. Resolving this paradox might be crucial for ecological interest in such sites to grow.

The tension between ecological and epidemiological concerns raises further conflicts. That mosquitoes have led us here in the first place is an indication that the site is difficult to fit into the narratives of reclamation and resilience that are



Young knotweed shoots unfurl in early spring (2017). Photo: Livia Cahn.

but its tiny flowers produce millions of seeds that spur on its recent and rapid spread in cities. Dandelions, with their familiar yellow flower, thistles, blackberries, and nettles: all of these flourish in derelict sites. What distinguishes knotweed is that it grows particularly fast. Knotweed can grow up to four centimetres a day and up to three metres tall.

Its tendency to dominate a plot is linked to the plant's particularly effective vegetative reproductive system. In Europe, the plant doesn't even form fertile seeds. It reproduces exclusively asexually. All knotweed plants in Europe are thought to be female clones.⁵

Knotweed blankets the ground with an extensive rhizomatic network of roots that can grow up to three metres deep and up to seven metres away from the parent plant. This extension of the plant that is buried underground constitutes its greatest total mass and its "trickery."⁶ While its leaves and stems die in the winter, its roots continue to expand and grow up to 50 centimetres a year. Its rhizomes can lie dormant in soils for up to ten years before sprouting. The presence of the knotweed is as mobile as urban soils: its growth is unforeseeable, ongoing, changing but incessant. There was a time when the fast growth of this plant was celebrated. In the 1840s, Phillippe von Siebold (1796–1866), a doctor and naturalist from Bavaria was stationed in Japan by the Dutch state. He imported a range of plants to Europe for his commercial enterprise in Leiden. A sales list catalogue from Siebold & Cie published in 1848 notes that in the previous year it had been awarded a gold medal by the Society of Agriculture and Horticulture at Utrecht.⁷ The medal was awarded to "the most interesting new ornamental plant of the year."⁸ At the time,

Fallopia japonica was independently classified as *Reynoutria japonica* by Houttuyn in 1777 and as *Polygonum cuspidatum/sieboldii* by Siebold in 1846. The taxonomical naming of this plant is as changeable as its reception. In 1901, the Japanese botanist Makino realized that the two plants were identical.⁹ It was generally referred to as *Polygonum cuspidatum* by Japanese and American authors, followed by Swiss botanist Carl Meissen's 1856 classification as *Fallopia japonica*. Today, these three names are considered to be synonyms for the same plant species in the *Polygonaceae* family. Some propose that it be reverted to *Reynoutria* based on DNA sequence analysis.¹⁰ "*Reynoutria japonica* Houtt," is cited as the preferred name in "The plant list," 2013, a list of reference for taxonomists. After much hesitation, the European Committee for Invasive Plants decided not to change the name of the plant in its literature. This would set a precedent for keeping up with taxonomists' debates. The reader will have noticed that I refer to plants by their common names. Knotweed has many common names: Japanese bamboo, donkey rhubarb, German sausage, and crimson beauty. Nicknames, whether affectionate or pejorative, express the various relationships constituted between the plant and people. These common names do not distinguish between the different species and varieties of the *Polygonum* family; they reflect the reality of the usual vernacular urban knowledge of this plant.

The fast-growing qualities of this plant in Europe are easily observed. As a laudatory footnote in the price list points out, the "interest" this plant generated comprised more than its fast-growing qualities.¹¹ A legacy of the Dutch colonial presence in Japan, knotweed was reportedly originally imported from Japan for its exotic qualities, and planted for its ornamental, aesthetic, utilitarian, and edible virtues too.¹² Gardeners would readily share cuttings. Even accidentally stepping on knotweed or pulling it out from the ground can cause a new plant to grow. Strikingly, even just 0.7 grams of rhizomatic material (10mm in length) can produce a new plant within ten days.¹³ Given the characteristics of its roots, human practices have been and continue to be the major factor in spreading the plant (sometimes inadvertently or even in an attempt to eradicate the plant).¹⁴

From botanical gardens to private gardens, this plant was introduced to European cities, bit-by-bit, step by step. One hundred and fifty years after having been praised in the very same places, the same plant is troubling gardeners, local authorities, and supranational legislations. Today, in the name of biodiversity and on the grounds that the plant severely damages "local" environments, the economy or human health, the knotweed "problem" is tackled by targeted eradication campaigns put in place by local authorities and European-wide listings.¹⁵ Its compact, fast-growing clumps limit the other plants growing around it by shading them. Furthermore, its roots emit compounds that are thought to alter soil chemistry and prohibit other plants from growing nearby. By reducing the plant biodiversity of plots, it also affects animal populations. Compared to other plants, knotweed stems are not particularly difficult to pull out of the ground. Generally speaking, however, gardeners be they communal or regional, are unable to muster the persistence and regularity necessary to eradicate knotweed, and in particular its rhizome.

The art of urban flora



**Part
3**

Lois Weinberger





Mona Caron





Yan Wang Preston



Framing urban landscapes: interview with Susanne Hauser

Susanne Hauser is one of the most innovative contributors to recent thinking on post-industrial landscapes, combining insights from aesthetics, history, and urban design. The interview took place in July 2015.

Matthew Gandy Can we still use the word *Brache*?

Susanne Hauser Yes, absolutely. It depends a bit on what for. *Brache* refers to something that has been used before, usually a piece of land, that is not in this specific use anymore, and is also in no other use that we would understand as such. The term *Brache* implies that no activities are currently happening, but it is not “nature,” or just a terrain, or a place prepared for something to happen. Aesthetically, there is a desire to conceive of a *Brache* as an entity, but I find this slightly misleading. It is a very distinctive idea, and also a very specific kind of historical approach, that derives a type of beauty from the *Brachen*. It requires a particular appreciation that is not applied at all times. Even in the current century, it has not been applied for a prolonged period so far.

Matthew Gandy Are there other words that we can use for these distinctive spaces in the city or in industrial landscapes?

Susanne Hauser Most words immediately imply some kind of utilization. For example, *Bauerwartungsland* (land awaiting development) imposes a legal framework; it still might appear as a *Brache* but something else has already happened. *Ruinengelände* (ruin terrain) does not apply to every *Brache*, because with ruins we expect to find remnants of human construction, which means there are traces of buildings.

Matthew Gandy Do *Brachen* have a specific aesthetics? Is there an aesthetics of *Brachen*?

Susanne Hauser Something like that has massively developed when large-scale industrial areas were abandoned in Europe—especially when heavy industries disinvested in northern and western Europe in the 1960s and 1970s. Similar developments happened thereafter in other parts of the world, of course. Industrial wastelands exist globally. At that time, the concept of an aesthetics of *Brachen* was useful, because plenty of land that obviously used to be productive was not in use anymore, so one had to come up with an idea for its interpretation and treatment. Aestheticizing is a common approach to finished objects and processes and was, when applied as a technique of rehabilitation, a cheap solution. But it only works when a cycle has been completed, when a process has come

to an end. Then one can showcase objects that tell you there was once economic activity on this site, there was industrial production here, and add a degree of aesthetic glamour. This is something that, at its highpoint in the 1980s and 1990s, and maybe still at the beginning of the third millennium, captured the imagination of many people, among them planners and designers. However, this does not work anymore. And this excitement was never universally shared. During the 1990s, I spent a lot of time in industrial wastelands in order to follow the processes and designs, and from time to time I was joined by colleagues and friends. Afterwards, however, the group of people I was with were often quite eager to spend some recreational time in a "real park" or a baroque garden. Above all, they were eager to spend time in some sort of regulated environment that did not so clearly exhibit the fact that it had slipped away from cultivation and care. What is disturbing about a *Brache* is that it has fallen out of control. It is associated with waste and ruin. Since no one uses the space, and sometimes nobody even knows how to use the space, there is no criterion for behaviour in relation to a *Brache*. This is unsettling because, apart from fences, there is no boundary, and nothing to civilize or cultivate the site. You have to cherish this aspect of *Brachen* if you want to cultivate an aesthetics for spaces of this kind.

Matthew Gandy What are your thoughts on urban ecology?

Susanne Hauser I think urban ecology became a fascinating academic discipline because there were these uncultivated zones to discover during the 1970s. These zones were, of course, very interesting. In a meticulously planned world such areas are extremely attractive. Studying them with the methods available to scientists at the time was really pioneering work. And these discoveries have, in the long run, become highly relevant for urban planning and design.

Matthew Gandy What does the idea of an urban landscape mean to you?

Susanne Hauser To see something as a landscape means to make use of a specific technology of vision: it means to take a specific point of view and to approach your surroundings as a continuous space stretching as far as your eyes can see. The contrast between city and countryside is not the relevant distinction here, although traditionally landscapes are associated with the countryside. The countryside implies an agrarian zone, or an agriculturally-oriented zone. This can include forests, rivers, and lakes. Even fish would belong in such a zone. The countryside can be very varied, but this does not turn it into a landscape. It only becomes a landscape when you look at it in this specific way. As such, we can certainly direct this technology of vision that has been practiced in relation to an agrarian idyll towards the city in order to see how urban space appears when viewed as a landscape. This approach has a long tradition too: ever since the eighteenth century there have been



Environmental monitoring map of the Berlin Tempelhof airfield, 2017. The map shows the 201 territories of the skylark spread across the airfield. Cartographic design: SWUP GmbH. Copyright: Grün Berlin.

in open and extensively used agricultural landscapes. At the latest count, the air-field has 241 species of bees and wasps,³ 25 species of breeding birds,⁴ over 20 orthopteran and butterfly species, and various biotopes with specific assemblages of plants.⁵ Many plants and animals are considered rare or endangered, yet it is one particular bird, the skylark, whose presence this brief essay follows, as it has shaped ecological debates, management regimes, design interventions, and political discussions over the future of this vast urban site.

The skylark is a marker of landscape change. Originally associated with steppes and dry grasslands in Europe and Asia, it has been a common feature of agricultural landscapes for centuries. The bird has a drab appearance, with streaky brown feathers, a buff-white belly, and a small crest on its head, which provides excellent camouflage among crops and earth, and yet it has a dramatic flight and distinctive song. Between spring and late summer, the birds nest on the ground, preferably in arable fields with mosaic-like vegetation heights. The skylark is not a typical urban bird. It tends to avoid areas close to buildings, trees, hedges, and other vertical structures. But urban meadows can provide a refuge for the skylark. These urban habitats become increasingly important in light of the absence of skylarks from rural landscapes.

Voted “bird of the year” by a German conservation group for the second time in 2019, the skylark has become a so-called flagship species. Flagship species are “animals serving as symbols and rallying points for various conservation goals.”⁶ The skylark represents the rapid decline of many farmland bird populations across Europe and is utilized by conservationists as a symbol for an environmental politics directed against the “catastrophic agricultural policies of Berlin and Brussels.”⁷ Since the 1970s, skylark numbers have plummeted dramatically in northern and western Europe. The main causes of this decline are intensified farming and trends towards monocultures, with the merging of agricultural holdings. Reduced crop diversity with homogenous sward that is often unsuitable as nesting ground, fertilizer use that accelerates plant growth and disrupts seasonal breeding rhythms, and pesticides that destroy the weeds and invertebrates that serve as food all further accelerate the disappearance of the skylark.⁸ After German reunification, arable land surrounding Berlin initially recovered from decades of intense soil exploitation by the agricultural cooperatives of the GDR. As portrayed in Volker Koepp’s documentary film *Landstück* (2016), a brief window of time during which family-run organic farms and nature conservation areas took hold and provided habitats for birds is now being closed at an increasing pace. Global financial interests are now reaching beyond the city of Berlin, as far as the Uckermark in Brandenburg, where the state is selling land to foreign investors who push for monocultures and industrialized types of meat production.⁹

Unlike other flagship animals like the panda or tiger, the skylark’s “non-human charisma” does not derive from its size, cuteness, exotic appeal, or other visual features stylized in emblems, but from its distinctive song or “acoustic charisma.”¹⁰ With the disappearance of the skylark from the acoustic landscape, a particular sense of loss is invoked, as has been recently expressed with reference to rural England by the writer Richard Mabey and the geographer Bill Adams.¹¹ This sense of loss and anxiety caused by the absence of birdsong has a longer cultural history, exemplified by the title of Rachel Carson’s influential book *Silent Spring* (1962). It has been featured prominently as part of a wider environmental critique of modernity in the field of sound ecology since the late 1960s. Contemporary debates in sound ecology that link with discussions on the Anthropocene still see processes of urbanization as a major cause of the changing global soundscape, and predict that the world is turning increasingly silent and discordant.¹² However, they neglect the role cities can play as refuges for birds and other species that become part of urban acoustic ecologies, beyond an idealized rural or natural sonic realm.

If we listen closely to the city and train our “ornithological ear,” we learn something about time and seasonality, topography and landscape. Hearing a skylark sing on a Berlin summer day, we will most likely find ourselves in an open space with the horizon in sight: a meadow sprouting in an abandoned plot of land; a former Hobrechtian *Rieselfeld* (sewage field) on the edge of the city; an airfield in the city centre. Airports in and around cities have become important refuges for skylarks and other ground-breeding birds. Unlike larger birds whose presence is deterred with lasers, with predators, or sonically, with flare guns and recorded bird



"Liv i död ved," one of several signs put up by the municipality of Gothenburg in order to inform local residents of the ecological potentiality of "dead" wood (2017). Photo: Mathilda Rosengren.

begins and the other ends. To the south and to the west, the greenery stretches further into the residential areas, ignoring the occasional fence put up a long time ago and the few asphalted pathways now rippled by the force of the roots of neighbouring trees. Thirdly, the name of the wood too is in flux: today, its official denomination is *Högåsberget*, although in the past, and in local parlance, *Trollspisberget* has been the most commonly used.² And, to confuse matters further, locals use the geotag *Johannebergsparken* (which in fact is another nearby park up on the hill) to locate the area online.

The indefinability that such multifaceted slipperiness brings with it has rendered the wood close to invisible to an official urban imaginary. Throughout the past century, in planning proposals as well as newspaper articles, the area has predominantly been approached as an add-on, a margin, or a side-product, particularly of the public park in the north; very rarely is it dealt with directly, if at all. In a sense, it has become an unintentional, long-term experiment in non-design: allowing for moderately undecided urban becomings through a municipal "letting things be," but without completely subsuming to a more disorderly "letting things go."³ And yet this "becoming of the unplanned" rather than the "being of the planned," also highlights a state of precariousness that may arise from the lack of a defined, human-made design. In the winter of 2016, when walking around the area together with one of the employees of the municipal Park and Nature Department (*Park och Naturförvaltningen*, PONF), the employee emphasized the predicament the

wood's borderlessness and namelessness put it in: "If we don't put an [official] name on it [the wood], it is very easy to come and nibble on it here. You see this [happening elsewhere], nature areas and parks without names have no identity and they are very easy to appropriate during a densification process."⁴ And it is true that, when the wood has surfaced to the consciousness of official municipal



The map shows the state of the wood in 1923 at the time of the Jubilee Exhibition that year. Its steep topography and sparse vegetation is displayed in white. The green-shaded southwesterly slopes and dells indicate the considerably more wooded condition at the edges of the area. Copyright: Göteborgs Stad.



Pineapple or Artichoke? Working map with pinned hotspots of disused gardens. Soodevahe is in the bottom right corner, south of the airport. The Northern Tallinn peninsula is in the upper left corner.
Photo: Katrin Koov.

and “natural.” With wastelands having been increasingly acknowledged as the last vestiges of authentically urban experience, there is a sense in which the contemporary referent to Marx’s metaphorical “garden” is renatured culture rather than cultivated nature—or, more specifically, renaturalized cultivated nature. Nevertheless, there is a tension between representing abandoned gardens as a form of urban nature that is “empty,” and recasting emptiness as a potential.

While some plants were gathered in Soodevahe (whose forthcoming demolition gave the event an air of botanical rescue), the bulk was collected in the Northern Tallinn neighbourhoods of Kalamaja, Kopli, and Paljassaare. This is significant in yet another way. Since the late nineteenth century, Tallinn’s industrialization was centred on Northern Tallinn, a peninsula that combined the advantage of a relatively central location with a sense of manufacturing and labour being isolated from the city. Primitive rental housing for workers is epitomized in the vernacular so-called Tallinn house typology (*Tallinna maja*), a two- to three-storey wooden apartment building consisting of single-room rental units, and a backyard garden. Surviving decades of decline and demolition plans, Northern Tallinn has recently experienced a surge of cultural interest and real estate investment. Since the financial crisis of 2008, the district has been consolidated as the city’s principal frontier of gentrification, living off the cultural appreciation of the neighbourhood’s vernacular atmosphere, which is reminiscent of an idealized past.²⁷

There is an ambiguous sense to “potentials” of disused gardens, wastelands, and other ostensibly empty spaces that is repeatedly emphasized by the authors of *Pineapple or Artichoke?*: are these “potentials” aesthetic, economic, or political? The actual gathering of plants took place, ironically, in conjunction with the so-called World Cleanup Day, an annual get-together during which volunteers collect rubbish and other waste, first initiated in Estonia in 2008 and today held in more than 150 countries. The event’s peremptory slogan of “Let’s do it together!” (*Teeme ära!*), suggests a form of community activism that eludes questions such as how and by whom waste is recognized as waste in the first place, and how cleaning might be imbued with ethnic and class connotations.²⁸ We might ask whether the museum functions as a medium of appreciating or of cleaning the wastelands of Northern Tallinn. What was being appreciated, and what was being cleaned away while producing the botanical non-site in KUMU?

The removal of plants from Northern Tallinn’s disused gardens to the museum, under the communal guise of “Let’s do it together!,” echoes uneasily the ongoing displacement of predominantly Russian-speaking and working-class inhabitants from that district. It may be that to dissociate the aesthetic value of disused or apparently disused gardens from the capacity to appreciate them aesthetically adds not only to segregation but also to homophily—that is, the idea that segregation is natural because similarity in status and shared cultural values breeds connection and fellowship.²⁹ The urban pastoralism that is put on display in *Pineapple or Artichoke?* cannot be easily separated from the neo-communitarian politics of place forged at the expense of those who are economically, culturally, and ethnically “other.”

According to Leo Marx, “the machine’s sudden entrance into the garden presents a problem that ultimately belongs not to art but to politics.”³⁰ The aesthetics of pastoralism, in other words, conveys but cannot resolve the variety of contradictions arising from urbanization in particular moments of history. In contemporary Tallinn, disused gardens evoke pastoral feelings in ways that blur boundaries between the garden and the wasteland. The Baltic variant of urban pastoralism has been animated by the symbolic rejection of socialist mass housing, as well as of post-socialist urban sprawl.

The metaphoric “machine,” in the story recounted above, is suburbanization—socialist and post-socialist. If, according to Leo Marx, urbanization and pastoralism were strangely coincidental, then urban pastoralism similarly coincides with gentrification. The aesthetic appreciation of gardens’ afterlives is part and parcel of the emerging sensibility for the overgrown and unkempt, most likely to be found today in the formerly working class inner cities. We need, nevertheless, to recognize the limits to that sensibility, insofar as it remains inattentive to its own implications in uneven urban development.

So, can we extend the thoughts of Karl and Leo Marx together by rethinking the questions of property relations and the speculative dynamics of urban value in the light of the aesthetic operations of pastoralism and ever-shifting notions of urban nature? This prospective programme—let’s call it urban political aesthetics—would

construction” and regional development.³ The afforestation plans for the Xishan hills were undertaken with the slogan of “greening first, beautifying followed” as part of a wider state instituted transformation of the existing landscape. While it once languished in relative obscurity, the art of Keran Li is now back in vogue, and the steeply rising prices for his work reflect the emerging tastes of wealthy collectors, with an interest in “authentic” types of Chinese landscapes. The large-scale afforestation “campaign” for the Xishan hills was carried out in the late 1950s using some 600,000 labourers, drawn mainly from the People’s Liberation Army. The “conquering of nature” through this vast public works project resulted in the planting of nearly 3,500 hectares of forest. This was followed by the introduction of “scientific forest management” by the Xishan Forest Farm created in 1962 as part of a wider impetus towards the maintenance of large-scale landscapes for scenery and recreation. The underlying principles of forestry through mass mobilization persist today and, reflected in events such as the annual Arbor Day that encourages public participation in the care and maintenance of forest trees.

The hills and mountains in the western part of Beijing cover approximately one-sixth of the metropolitan area (as defined by the urban municipality). Long before the destruction and reconstruction of this landscape, the area had served for many centuries as a place of refuge or religious worship for city dwellers. This area had always been an intricate patchwork of different cultures of nature, including temples and imperial gardens as well as more “natural” fragments of the original forest at the edge of the city. The growing popularity of the Xishan hills is thus woven into a much longer history of urban interactions with nature. Every autumn there is now a “red leaves festival” that attracts hundreds of thousands of visitors. Increasing public use has forced environmental managers to adopt more sophisticated measures to protect environmentally sensitive areas, including the recent creation of “ecological conservation zones.” As a recognition of the complex balancing act between social and environmental objectives, the area has now been designated as the Xishan National Forest Park with intense and on-going levels of governmental intervention.

By the 1990s, after 40 years of large-scale tree planting efforts, the Xishan hills had achieved a forest cover of over 90 percent through a combination of both human endeavour and natural succession. Interest in “forest tourism” had also grown steadily, with over three million annual visits by the mid-2000s and a diversification between various forms of “mass tourism” and independent visitors or backpackers referred to as *lìyou* (驴友) or “donkey friends,” who seek out more “wild” types of nature with fewer types of management intervention or commercial types of recreational facilities. Concern about public health, especially in the wake of the SARS outbreak in Beijing in 2003, has also contributed to the urban popularity of hiking, trekking, and greater contact with nature on the urban fringe.

Forest management practices for the Xishan hills also became more internationalized in the 1990s, with approval from the state forestry administration of PRC signalling a greater openness to international developments in environmental thought, including new techniques in ecological management. The traditional Chinese



Red leaves landscape on Xishan Hills (西山红叶, Xi Shan Hong Ye) (2007). Courtesy of 西山林场 (Xishan Forest Farm).

emphasis on trying to give artificial landscapes the semblance of “natural” or “un-adorned” spaces was supplemented by a new interest in applying ecological insights into vegetation dynamics, such as the “close-to-nature” forestry developed in Germany and “scenic beauty estimation” in the United States.⁴ This change in forestry practice reflects a new kind of synthesis between science and aesthetics enabled by a more techno-managerialist ethos including novel approaches to the handling of environmental data. An initial focus of interest was how better to care for native tree species such as the Chinese red pine (*Pinus tabuliformis*) as part of a wider drive to produce “optimum landscapes” that could combine aesthetic, ecological, and social principles.⁵ This shift in emphasis is also illustrated by the application of “scenic beauty estimation” techniques to determine ideal colour ratios for autumn foliage. (This is a clear sign of American influence. American newspapers even publish “fall colour maps” to indicate the shifting contours of the “peak” experience.)

The creation of the ideal autumn landscape, with the most vibrant colours, raises tensions between variants of aesthetic and ecological authenticity. The popular autumn display of the Xishan hills is actually derived from a mix of about ten species. While most of these species are native such as the smoke tree (*Cotinus coggygria*), there has been intense debate concerning the inclusion of the non-native

Urban plants: a window on how ecology becomes evolution

Peter Del Tredici

The plants that grow spontaneously in abandoned or unmanaged urban landscapes deserve to be admired for their ability to grow under extremely harsh conditions. In general, such plants need to be *adaptable* (i.e. non-specialized) in all aspects of their life history, from germination through to seed production and dispersal; *opportunistic* in their ability to take advantage of locally abundant resources (water, light, and nutrients) that may be available for only a short period of time; and *tolerant* of the adverse growing conditions (heat and drought) created by covering the soil with pavement.¹

Through a quirk of evolutionary fate, many of these species have evolved life-history traits in their native habitats that “pre-adapt” them to flourish in cities. Indeed, numerous studies have pointed out that many urban plants are native to exposed limestone cliffs and rocky outcrops, or to grasslands with sandy, alkaline soils.² The authors argue—by analogy—that the tall brick or granite-faced buildings and concrete foundations of cities are geologically equivalent to the mountainous environments where these species originated. In a similar vein, they suggest that the increased use of de-icing salts along walkways and highways has produced high pH microhabitats which are also colonized by limestone-loving species, including many from coastal habitats.

Many pre-adapted urban plants also originated in natural habitats that experience high levels of disturbance, including riverbanks (seasonal flooding), grasslands and prairies (burning and grazing), eroded slopes (unstable soil), and coastal or arid zones (salty soils).³ Pre-adaptation is a powerful idea for understanding urban plant ecology for two reasons: firstly, it helps to answer questions about why some species are common in cities whereas others are not, and, secondly, it replaces a static, “native” definition of nature based on history and geography with a dynamic, “cosmopolitan” definition based on fitness and flux.

Relative to adjacent non-urban areas, cities are characterized by 1) increased levels of atmospheric nitrogen deposition and carbon dioxide; 2) increased growing season length and temperature; 3) shorter, warmer winters; 4) increased levels of



Princess tree, *Paulownia tomentosa*, colonizing an abandoned brick building in New London, Connecticut. Photo: Peter Del Tredici.

impervious surface and storm water runoff; 5) increased soil compaction and reduced moisture retention; and 6) increased road salt applications and elevated soil pHs.⁴ Recent research across gradients of both space and time has determined that up to 40 percent of the plants that grow in large urban areas in Europe are non-native to the area, and that urbanization favours the growth of species that are tolerant of soils that are relatively *fertile*, *dry*, *sunny*, and *alkaline*.⁵ In light of their unique environmental conditions and the cosmopolitan nature of their flora, cities clearly fit the definition of a “novel ecosystem” that has been irrevocably altered by human activity.⁶

In the remainder of this article, I will describe nine different urban environmental conditions that wild plants are pre-adapted to, along with examples of species that flourish under these conditions. While these examples are based primarily on personal observations of spontaneous vegetation in the cities of northeastern North America, the underlying ecological principles are applicable to urban areas across the globe.⁷



Rodney M. Burton's *Flora of the London Area* was published by the London Natural History and covered the period from 1965 to 1976.

and the surrounding area. This undertaking was inspired by the BSBI's (then known as the Botanical Society of the British Isles) recently published (1962) *Atlas of the British Flora*. The *Atlas* consisted of dot-maps based upon a ten-kilometre grid aligned to the UK National Grid. Prior to this, most mapping exercises, such as Robert Lloyd Praeger's *The Botanist in Ireland* (1934) used various forms of shading (and no grid-lines) to denote plant distributions. Incidentally, Praeger introduced the vice-county system to Ireland (there, the vice-counties are also numbered consecutively but are prefixed with the letter 'H' for Hibernia). The LNHS project

commenced on 1 January 1965 and was to cover an area known as the "LNHS polygon." The polygon is based upon the society's recording scope, which covers a 20-mile radius centred upon St Paul's Cathedral and encompasses the whole of the Middlesex vice-county as well as the parts of West Kent (vc 16), Surrey (vc 17, South and North Essex (vcs 18 & 19), Hertfordshire (vc 20) and the easternmost tip of Buckinghamshire (vc 24) that either border Greater London or have been engulfed by its twentieth-century expansion. The project involved the cumulated efforts of hundreds of volunteers and collecting data from 856 tetrads (a 2×2 km square) between 1965 and the early 1980s. These efforts resulted in the publication by Rodney Burton of the *Flora of the London Area* in 1983.

Recording and documenting the plant life of a given area is very time-consuming. Most county floras, as they are known, take at least 20 years to complete. In 2006 I succeeded Rodney Burton as the BSBI vice-county recorder for Middlesex and the equivalent LNHS role as "vascular plant recorder." Shortly afterward, I proposed to the LNHS botany committee that we should undertake a new mapping project. This project operates under the working title of The London Flora Project. It operates in a very similar way to that used by the earlier LNHS scheme, but with some differences. Probably the most significant of these is that we are attempting to record at the monad (a 1×1 km square). This has increased the number of squares to "bash," as it is known, from 856 tetrads to 3,424 monads (there being four monads in each tetrad). Also, since the publication of the last London flora, we have entered the era of the computer. Records may still be collected on recording cards with tick boxes or jotted down in note books, but online platforms for recording are increasingly being utilized.

Extensive datasets are being compiled on spreadsheets and the data stored by our local biological recording centre, Greenspace Information for Greater London (GIGL). The advent of organizations like GIGL with the capacity and the resources to store offers significant benefits as well as challenges. Shortly after starting the current project, I asked about the whereabouts of the recording cards for the earlier London flora project, only to learn that they had been disposed of by relatives of the woman who had been caring for them after she had passed away. We had lost much of the original data from that scheme, and we were obliged to use the dot maps in Burton's flora and optical character recognition software to extract the data. While much of the data was rescued, a huge amount of information was lost forever. Even though the digital environment has its drawbacks, the ability to store data in multiple locations should reduce the risk of future losses. I now have my Middlesex data backed up in GIGL, the BSBI's own database, as well as on the National Biodiversity Network's (NBN) system. On the downside, the current project has faced an enormous task in terms of transferring records collected over the last 200 years into digital format. Herbariums, publications, journals, and old county floras have been scoured to retrieve data that otherwise would be unavailable for comparison with the current recording effort. There is also the added complication that the LNHS polygon overlays the pre-existing BSBI vice-county system and the modern GLA and London boundaries. This requires a lot of collaboration. Records

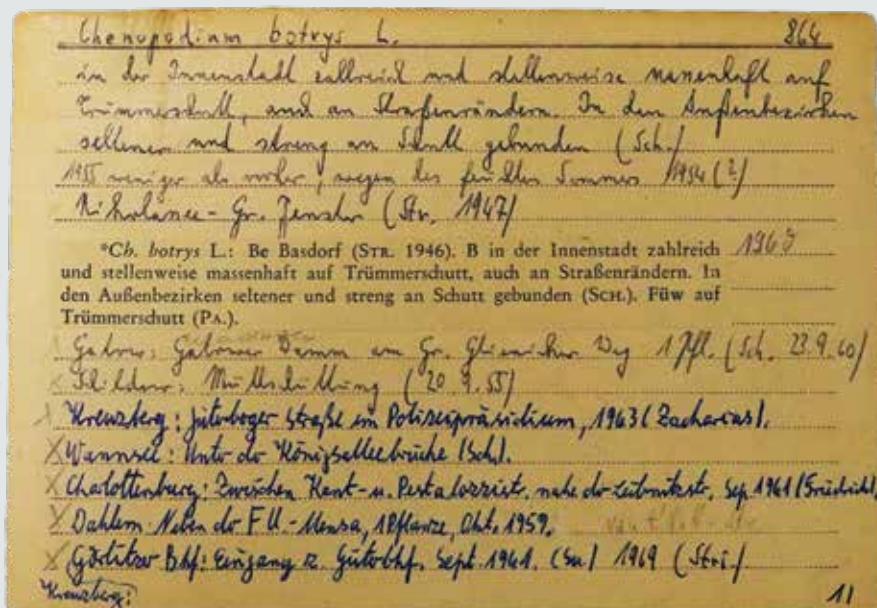


Current occurrence of *Dysphania botrys* in front of the Berlin Reichstag—a relic of former fallow land. Photo: Heiderose Häslar.

The first floristic data was published 1578 in an herbal book by Leonhard Thurneisser zum Thurn.¹ He collected plants in the former herb garden of the monastery Graues Kloster. The oldest localized floristic record was published in the *Flora Marchica* of Elssholz (1663), *Stipa pennata* in front of the Georgentor (now Alexanderplatz).² In the year 1787, Carl Ludwig Willdenow published the first flora of Berlin, *Florae Berolinensis Prodromus*, which featured 822 species of wild and cultivated plants.³ With the founding of the Botanical Society of the province of Brandenburg (now the Botanical Society of Berlin and Brandenburg) in the year 1849, the floristic investigation of Berlin and Brandenburg gained new impetus. The results of floristic investigations were published in an annual journal which serves as a vital historical record. In 1859, Paul Ascherson, one of the key figures in the Botanical Society, published a systematic flora of Berlin.⁴ It was an outstanding and detailed flora, summarizing the floristic investigations of Berlin up to this point in time. This flora and the Society's journal delivered most of the historical data for the atlas of Berlin's flora.⁵ Even Ascherson wrote about the changes in Berlin's flora due to industrialization and the intensification of agriculture. In fact, Berlin's role as an industrial and trade centre led not only to the loss of habitats and species, but also to the introduction of several non-native species. Lists of introduced plants were summarized by Ascherson in 1854 and by Oskar Alexander Richard Büttner in 1884 in his *Flora Advena Marchica*.⁶ Some now widespread species like *Galinsoga parviflora* or *Impatiens parviflora* were naturalized nineteenth-century escapes from Berlin's Botanical Garden.

This was the time when the systematic mapping of plants began in some regions of Germany. Two different concepts were pursued at the time: the mapping of the precise position of selected species, and the mapping of the whole flora within defined grid fields. The first call for the systematic grid mapping of all plants across the whole of Germany was initiated by Johannes Mattfeld at the Berlin Botanical Museum in 1922. The aim was the recording of all wildgrowing (including non-native) species within a grid pattern of 250 metres on the basis of topographical maps. Unfortunately, these cartographic data were destroyed during World War II. In post-1960 Germany, the grid mapping project started again as a part of the floristic mapping of Central Europe. It was initiated by Friedrich Ehrendorfer and Ulrich Hamann in 1964 on the basis of the topographical maps on a scale of 1:25,000. For the western part of Germany (the BRD), the data was collected at the University of Göttingen by Heinz Ellenberg, and later at the Universities of Bochum and Regensburg. The central office of floristic mapping in the eastern part of Germany (the GDR) was at the University of Halle. The role of the central offices was the coordination and data collection of several regional mapping projects.

In the mid-twentieth century, the floristic investigation of Berlin prospered again, with the emerging discipline of urban ecology led by Herbert Sukopp and others.⁷ An outstanding example for the recent evolution of species was the increasing diversity of the evening primrose (*Oenothera*) after World War II. *Oenothera coronifera* originated in Berlin through hybridization, and nineteen taxa have thus far been recorded.



Historical traces of *Dysphania botrys* (former name *Chenopodium botrys*) in Berlin after World War II.
 Card index by Herbert Sukopp.

Imprint

© 2020 by jovis Verlag GmbH

Texts by kind permission of the authors.

Pictures by kind permission of the photographers/holders of the picture rights.

All rights reserved.

Copyediting: Alison Kirkland, Ashford, Kent

Design and typesetting: Susanne Rösler, jovis, Berlin

Lithography: Bild1Druck, Berlin

Printed in the European Union

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche
Nationalbibliografie; detailed bibliographic data are available on the Internet
at <http://dnb.d-nb.de>

jovis Verlag GmbH

Kurfürstenstraße 15/16

10785 Berlin

www.jovis.de

jovis books are available worldwide in select bookstores. Please contact your
nearest bookseller or visit www.jovis.de for information concerning your local
distribution.

ISBN 978-3-86859-519-2