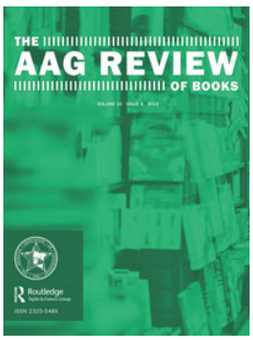

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Natura Urbana: Ecological Constellations in Urban Space

Matthew Gandy. Cambridge, MA: The MIT Press, 2022. xiv + 416 pp. $30.00 (ISBN 9780262046282).

Dawn Day Biehler, Julian Agyeman, Stephanie Wakefield, Marion Ernwein & Matthew Gandy

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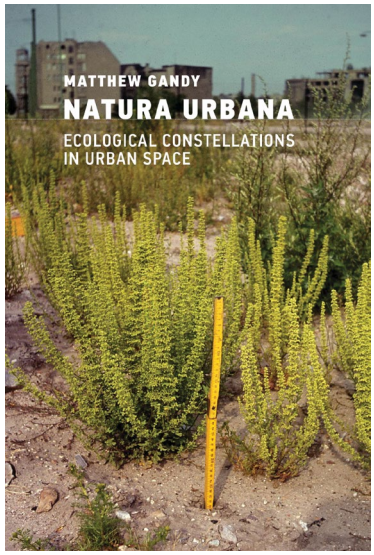
BOOK REVIEW FORUM

Natura Urbana: Ecological Constellations in Urban Space

Matthew Gandy. Cambridge, MA: The MIT Press, 2022. xiv + 416 pp. $30.00 (ISBN 9780262046282).

Commentary by Dawn Day Biehler, Department of Geography and Environmental Systems, University of Maryland, Baltimore, MD, USA.



Over the past twenty years, Matthew Gandy has written about moths, water, light, sound, tuberculosis, hardy cosmopolitan plants, and many more of the other-than-human multitudes that embody urban ecologies. Few entities escape Gandy's careful attention, and the lenses he turns on these city dwellers reveal in each a universe of tensions among the scientific, the political, the aesthetic, and the affective. Gandy's latest book, *Natura Urbana: Ecological Constellations in Urban Space*, feels like a culmination of these two decades of writing (and filmmaking) about cities. The book takes stock of the ways scientists, artists, philosophers, the state, and human city dwellers in general have understood nature in the interstices of the urban landscape. Gandy assembles a rich ecosystem of examples and theoretical material, troubling the history of intellectual and policy engagement with city natures while pointing toward pluralist urban ecological futures.

One of the most striking features of *Natura Urbana* is its concern with "marginal" spaces—those not designed as city parks or wildlife corridors. Many such spaces the world over result from warfare, technological obsolescence, racist disinvestment, the deathly churn of uneven capitalist development, and simply the aging of infrastructure, tearing at cities' physical and social fabric. These spaces also teem with life: ferals and strays, globalized synanthropes, hardy generalists, microbes, some lurking big cats, and often ecological communities important for preserving rare species.

Many writers and readers, including environmentalists and city planners, romanticize these spaces, spawning yet another thriving entity: a subgenre of ruin porn, the urban nature writing fascinated with rewilding cities in the so-called Anthropocene yet naive of the politics of these spaces. *Natura Urbana* unsettles the aestheticization of urban nature in the margins, and Gandy rightly insists that all aesthetics are political. In these spaces, marginalized human groups struggle for survival, resisting both globalized capital (often embodied in real estate firms devouring the city) and those environmentalists who are at least as blinkered as they are well-meaning.

As a geographer from the settler society of the United States who focuses on the historical urban environments of North America and Turtle Island, I found *Natura Urbana* deeply helpful for illuminating other pasts and presents that have shaped struggles over interstitial urban nature. The wastelands or *Brachen* of Berlin particularly opened my eyes; Gandy explores these in his 2017 documentary, and they reappear throughout the book as well. Ecological communities have thrived in parcels and blocks leveled by bombing during World War II and in the strip of land where the Berlin Wall formerly stood, as well as in sites of abandoned industry and infrastructure. The word *Brache* implies that these lands lie fallow in the agricultural sense, not mere "wastelands" as some might assume—a subtlety connoting regeneration over long time scales rather than languishing redundancy or emptiness. Scientists, planners, and the broad public value these sites; advocates even succeeded in protecting biodiversity in Berlin's Südgelände park, an old rail

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corridor. Gandy argues that art and science about such spaces in Berlin "transcend positivist notions of ethical neutrality to encompass critically reflective perspectives on the socioecological dynamics of capitalist urbanization" (p. 140).

Gandy's narrative of critical engagement lays a path for places where discourse and aesthetics of marginal land remain romanticized and depoliticized. In Baltimore, Maryland, one of the locations of my own work, media and city policies represent tens of thousands of land parcels as abandoned or vacant. Such spaces, already layered atop erased landscapes of the Piscataway Conoy and Susquehannock people, actually brim with history, life, and culture. Here, "the periodicities of capital intersect with the temporalities of nonhuman nature" (p. 206). As in Detroit, Cleveland, and Philadelphia, governments and banks long denied Black neighborhoods investment, industry has moved to the suburbs or abroad, and so-called urban renewal and highway schemes demolished city blocks. Now, White environmentalists see opportunities here for green infrastructure, climate mitigation schemes, and even food production. The "discovery" of such opportunities echoes McKittrick's (2013) critique of Europeans' expanding plantation logics that consumed "uninhabitable" lands. Meanwhile, Black residents mourn the loss of human neighbors who had once lived in row houses that stood there, now crumbling after decades during which banks, realtors, and city government have channeled money to spaces they consider more profitable. As Gandy rightly notes, the hardy species taking root in abandoned lots represent not only legacies of past policies, but conditions that municipal governments, banks, and others actively maintain through planning, deferred maintenance, and differential investment. Because racial capitalism shapes these spaces of spontaneous other-than-human flourishing, their ecological communities connote neglect and marginalization for people who have watched this process unfold—and they often contain species that bring real harm, such as persistent, crepuscular mosquitoes, poison ivy creeping up to the rooftops, or *Ailanthus* bursting through the hollow frame of a row house.

Activists find remedy in asserting their own agency, claiming and remaking these parcels. They eschew ruin porn that erases human power, instead bridging the history of Black vernacular gardens toward urban futures of self-sovereignty and healing. Black vernacular gardens have long "made a way of no way," ingeniously salvaging shared plant materials, broken pottery, and other items and piecing them together like fabric scraps in a quilt (Glave 2003; Sills, Hilton, and Pei 2010). At one such site in West Baltimore, artists and community members borrowed motifs from sunflowers and birch trees, both sprouting from the ground and painted on adjacent buildings, black-and-white stripes on seed hulls and bark contrasting with yellow petals and green leaves. In another, a longtime resident artfully arranged medicinal herbs, including some selected to repel the invasive *Aedes albopictus* mosquito, with shards of stone, tree limbs, and broken signs. In an interview, a community member who helps maintain the latter garden explained that neighbors needed to know that Black people created the space rather than allowing a meadow to grow on its own.

Gandy notes that the "Plantationocene" helps conceptualize "global environmental change [by] emphasiz[ing] the centrality of racial difference to the construction of extractive frontiers" (p. 205). A vital piece of this Plantationocene concept is the "plot," whose double meaning references both enslaved people's kitchen gardens and plans for subversion and escape that flourished there (Davis et al. 2019). Across vast swathes of U.S. cities, residents such as those in Baltimore are "plotting" ecological futures. They often do so within necropolitical matrices as the state withdraws vital infrastructural resources and intensifies resources for policing.

Gandy's ecological pluriverse invites a multitude of "plots" and *Brachen* alongside other stories of urban spaces, species, and struggles. *Natura Urbana* also compiles and explores a wealth of techniques for human communities to tell nonhuman stories—Black ecologies and queer transects, Indigenous and feminist epistemologies, historical materialism, and landscape forensics. I look forward to seeing what grows in this ground that Gandy has shared.

Commentary by Julian Agyeman, Department of Urban Environmental Policy and Planning, Tufts University, Medford, MA, USA.

Matthew Gandy and I have been working on urban environmental questions for a long time. After reading his latest book, *Natura Urbana*, I was struck in particular in the introduction by Gandy's opening description of his childhood fascination with urban nature in London, which echoes my own encounters with nature growing up in Yorkshire. Our early experiences led us both to pursue geography degrees (in my case as a joint honors degree with botany) and we are now both engaged with the study of different aspects of urban environmental change, in my case through the lens of critical urban planning, whereas Gandy's work lies closer to the fields of cultural and urban geography.

The book's introduction raises two pressing questions inspired by Gandy's visit to an art exhibition on the biodiversity of an urban wasteland held at the AirSpace Gallery in Stoke-on-Trent in northern England:

> Does the recognition of "new natures," exemplified by the cultural valorization of wastelands, offer an alternative to the rise of xenophobic nationalism, and what the writer Anthony Barnett describes as "England without London," rooted in an antimetropolitan, isolationist, and backward-looking political imaginary? (p. 3)

Gandy continues:

> Can a different vision of nature, landscape, and society, as both cosmopolitan yet locally distinct, offer a way out of the postindustrial malaise that has blighted so many communities? (p. 3)

In other words, do specific manifestations of urban nature have the capacity to challenge existing conceptions of nature, landscape, and conservation biology that remain steeped in a variety of colonial, nativist, and often reactionary environmental discourses? In my PhD dissertation, I argued that curriculum planners and teachers have been influenced by what I term *urban wildlife groups*, who have selected and promoted concepts from a set of existing ecological values, theories, and practices. In particular, the distinction between "native" and "alien" plant species on the basis of their utility to wildlife is a key concept that permeated thinking through these emerging urban wildlife groups in the United Kingdom during the 1980s and subsequently influenced environmental education in schools. The alternative approach that I articulated in my thesis provides both the contextual and theoretical underpinnings for the study of urban nature through the entity of what I term the *Multicultural City Ecosystem* and through the process of multicultural ecology.

I would suggest that my delineation of the Multicultural City Ecosystem has similarities with what Gandy describes in the 1970s and 1980s in West Berlin where explicit parallels were being drawn between the *Multikulti* characteristics of urban society and the cosmopolitan characteristics of urban ecology. It is in this context that radical environmental groups such as the Alternative List (a precursor to the contemporary Green Party) sought to simultaneously defend ethnic minorities from pervasive racism and officially sanctioned discrimination and at the same time defend unusual spaces of urban nature from speculative development pressures. In a profound sense, then, this emerging "multicultural" standpoint in urban ecology sought to engage with the actually existing social and ecological characteristics of urban space. From the standpoint of my interest in the Multicultural City Ecosystem developed in a UK context, the emphasis lies on what is there and why it is there and not the mainstream ecological perspective I encountered within urban wildlife groups that insisted on what should be there. The multicultural perspective is thus concerned with the cultural and ecological complexities of material spaces rather than idealized conceptions of urban nature.

But how are we to make sense of this now vast field of urban ecological thought? Do these earlier debates from the 1970s and 1980s still have contemporary resonance? I find Gandy's articulation of four main perspectives within urban ecological thought to be a very helpful entry point:

> first, the evolution of a series of systems-based approaches, with their roots in the analysis of urbanization as a dynamic interaction between different elements, including energy, materials, and human mobility; second, an intense focus on urban nature as an observational field, with links to early modern botany, marking a shift from medicinal to classificatory idioms, and framed by the evolving scope of a distinctly urban natural history; third, the emerging influence of "political ecology" within urban theory, marked by a synthesis between neo-Marxian and metabolic insights into the production of urban space; and fourth, a more recent emphasis on what I term the "ecological pluriverse" derived from a combination of posthuman and postcolonial conceptions of urban space. (pp. 18–19)

I agree with Gandy's contention that the systems-based approach is almost completely dominant within the urban environmental field. Thinking as the head of an accredited urban and environmental policy and planning program that trains urban planners, environmental policymakers, and planners, it seems to me that the most prominent perspective in the U.S. curriculum is without doubt dominated by various systems-based approaches with urban political ecology only emerging as a distant second (depending on faculty interests). In reading this book I am struck by the ongoing challenge to shift away from the prevailing environmental paradigms that continue to permeate both professional practice and most teaching programs.

Based on my reading of Gandy's book there are a series of further questions that I would like to raise as a basis for further discussion and reflection. How can we shift both the urban and environmental policy and planning curriculum and professional practice toward the kind of "ecological pluriverse" perspective that Gandy outlines? How might this shift relate to the current obsessions du jour in urban planning such as place-making, low-impact development and resilience planning, gentrification, and displacement? How might ecological pluriversal thinking destabilize the segregated U.S. city where urban planning has served as the spatial toolkit of White supremacy?

Commentary by Stephanie Wakefield, Department of Natural Sciences, LIFE University, Marietta, GA, USA.

I have admired Matthew Gandy's work for a long time. *Concrete and Clay* (Gandy 2002) was the textbook for the Urban Environment course I taught for years at Queens College, where it offered the perfect window onto the politics, ideologies, and metabolisms of New York's "metropolitan natures." As I read Gandy's latest book, *Natura Urbana*, I could not help but think of it in relation to *Concrete and Clay*, and more specifically in relation to broader urban–environmental forms of thinking that have exploded since its publication in 2002. Since then, the Anthropocene has come to signify an era of climactic but also epistemological crisis, in which human–nature and city–environment dualisms are widely seen as obsolete artifacts of erroneous modern thinking. In response, critical thinkers, designers, and governments alike have widely embraced entangled more-than-human ontologies and design approaches. This is especially so in governmental contexts, where systems thinking now grounds efforts to manage populations, cities, and even the earth in the age of climate change.

In this context the book speaks to a key question for critical more-than-human or new materialist thinkers: How should we deal with the reality that human–nature entanglement thinking, although often forwarded as counterhegemonic, is hegemonic already, particularly in now-dominant urban resilience, cybernetic, and conventional earth systems governance approaches? In applied systems thinking-based and biophysical sciences versions of human ecology, urban ecology, and urban resilience, the horizon and parameters of urban human–nonhuman relational thinking are often very narrow. "Bringing nature back" into cities is often but a new mode of governing cities, one seen as proper to the age of climate change and permanent crisis. Here we might think of attempts to bring nature into cities to use and mobilize its perceived natural processes to govern other natures. There is nothing necessarily wrong with enrolling nature for human ends. When employed toward preserving existing political economic regimes, however, it is a specific frame that yields extremely limited imaginaries and limits political possibilities.

Can, and if so how can, urban ecological approaches and imaginaries be politically trenchant? Rather than propping up governmental efforts to secure existing systems, how can urban ecological thinking help open imaginaries of liberatory transformation and resistance, even in the Anthropocene? *Natura Urbana* gets at these questions in different ways. The book brings insights from different, often isolated strands of urban ecology into conversation to draw out other modes of thinking and imagining city–nature entanglements. The book is extremely rich with stories and examples of how urban ecology can be anti- or ungovernable, and emphasizes places, moments, and relations where animals or people become together in ways that evade biopolitical government or domestication. In stories of what Gandy calls "feral urban ecology" (p. 57), for example, coyotes make incursions into urban spaces and infrastructure. Foxes find niches in low-density housing blocks. Wolves lurk in postindustrial ruins. Stray dogs proliferate in the wake of urban unrest and political upheaval. Tales like these are common in urban ecology textbooks, in which they are often portrayed as examples of Anthropocene adaptations. Gandy instead emphasizes the element of dedomestication in the human–animal encounters, such as in the film *Wild*, wherein a young woman captures a wolf living in the park near her housing complex. Writes Gandy, "after subduing the wolf with a tranquilizer dart she attempts to domesticate the animal in her apartment. Over time, however, it is Ania who becomes more wolflike in her behavior. She becomes increasingly 'feral' in her interactions with the outside world and dreams about allowing the wolf to lick her menstrual blood" (p. 55). Similarly, writing of the film *Foxes*, he describes a woman who meets a group of foxes who congregate each night in her garden, and, "transfixed by their eerie nocturnal shrieking" (p. 57), jumps over her garden fence to vanish into their fox world. In contrast to governmental urban ecological thinking—and equally in contrast to much Anthropocene critical thinking, where focus is often on precarity, fragility, and survival in multispecies entanglements—these are stories whose affective and political inflection is antigovernmental or transgressive, and whose characters "become" in rather less socially acceptable ways.

My favorite thing about *Natura Urbana* is the fact that Gandy explicitly holds on to human agential capacity even while exploring more-than-human contexts. This is an important contrast to much critical Anthropocene entanglement thinking (with, of course, the exception of the systems-based governmental versions of urban ecology/resilience, in which human agency is only ever a matter of governing systems, nothing more; Wakefield, Grove, and Chandler 2022). Instead of declaring the need to "humble" human beings to coexistence and survival amongst ruins, it seems critical to insist on human agency, particularly in this age of climate change and political conflict.

In a similar vein, Gandy draws attention to how many uprisings and movements have been tied, at least initially or nominally, to protection of urban natures. Here, of course, he mentions the Gezi Park occupation in Istanbul (2013),

which stands alongside the many other blockades and occupations to stop construction of sites of what Brenner and Schmid (2015) called "extended urbanization" (e.g., pipelines, airports, or high-speed trains) over lands, histories, homes, and futures. Like Gezi Park, conflicts like the occupation in Standing Rock, the ZAD in France, and the NO TAV movement in Italy, all open a portal to new lands in which new subjectivities, new truths, and new human–nature relations can emerge, in and through struggles to "save" certain natures and ways of life. Most recently, in New York, we might think of the fight against the City of New York's bulldozing of the beautiful East River Park, a holdout against Shake Shack gentrified New York, to build the East Side Coastal Resiliency Project (ESCR), a "world-class park"-slash-resiliency sea wall to govern sea rise and flooding along the coast.

This example of the ESCR brings up something that Gandy discusses less in the book, which is how resilience planning in cities is itself producing new, specifically Anthropocenic urban natures and ecologies. Building the ESCR entails replacing existing natures—which are not at all natural of course; the East River Park was constructed by Robert Moses in the 1930s—with new resilient natures, like salt-water-resistant plant and tree species, which it hopes will field Anthropocenic nature (sea rise) encroaching on the city. Here the fight to save the park entails pitting multiple forms of nature against each other. These and other new urban natures emerging via city planners' attempts to govern climate change—such as experimental incorporation of animals like oysters into urban coastlines to act as living breakwaters or rehabilitated regional ecosystems like the Everglades to act as critical urban drinking water infrastructure—constitute a very interesting area for critical urban ecological thinkers to explore. *Natura Urbana* opens up so many such avenues for future urban ecological thought and I am excited to see what will emerge in its wake.

Commentary by Marion Ernwein, School of Social Sciences and Global Studies, The Open University, UK.

In his latest book, Matthew Gandy continues his exploration of the scientific, cultural, political, and ethical dimensions of spontaneous nonhuman life in cities, a theme that already runs through his recent film, *Natura Urbana: The Brachen of Berlin* (Gandy 2017), and coedited book, *The Botanical City* (Gandy and Jasper 2020). There are explicit and implicit traces throughout the book of the influence of "green" urban political ecological thought—for example, in Gandy's critical take on "ecological simulacra," expressions of urban design that superficially mimic spontaneous ecologies but ultimately mainly aim to increase real estate value (p. 100). In fact, though, Gandy does not spend much time engaging with these sorts of projects. Instead, he devotes most of his attention to the unplanned, spontaneous nonhuman life that thrives in wastelands, *terrains vagues*, and other interstitial spaces within metropolitan areas—a stance that makes it stand out within a genre that often focuses on the production or metabolization of nature.

The marginal urban landscapes examined by Gandy are the often-overlooked by-products of infrastructural modernity. Whereas governmental and scientific interest toward these types of sites long remained marginal, artistic and grassroots engagement with them have a long and vibrant history. It is precisely one of the book's great achievements to examine the articulations between different sorts of engagements with spontaneous nature—from urban ecological science to what Gandy calls "civic ecologies," all the way to cinema, photography, and literature. A key topic running through the book is how and to what extent spontaneous urban nature can be known, by whom, and with what effects. One of Gandy's key interests in the book is the political potency of knowledge about spontaneous nature. Throughout the book, he insists on the intellectual work inspired by spontaneous plants, and its political effects, ranging from destabilizing colonial and postcolonial ways of knowing nature (particularly their nativist trope, embodied in discourses on indigenous vs. alien species) to instrumentalizing opposition to neoliberal state-led development plans.

Another stated goal of the book is to think creatively about autonomous, agential nature. The emphasis on spontaneity inspires Gandy's conceptual engagement with nonhuman agency. What does it mean for nature to be spontaneous? What is the political potency of spontaneity in contemporary urbanism? How can one emphasize the spontaneous character of nonhuman life while retaining something of the specificity of human agency? By attempting to deal with these questions, the book contributes to recent, ongoing efforts to enliven urban political ecology. The conceptual questions around agency—and their ethical extensions—are introduced in chapter 1, "Zoöpolis Redux." They are exemplified through urban animals and the different registers of their agency. I was in fact surprised to see animal geographies—and specifically Wolch's (1996) essay "Zoöpolis"—used to introduce conceptual questions of agency, given the relatively greater presence of flora rather than fauna in the book. It got me wondering: Would these animal-inspired registers of agency work if one were to write a "plantopolis" rather than a "zoöpolis"? One where plants are world-makers who matter? Some of the ontological and ethical questions

associated with recognizing the agency of animals—for example, the urge to look beyond species to understand individual animals' trajectories and agencies—can prove limited in the plant realm, where the delineation between an individual and a community is much more tenuous (Atchison and Head 2013) and a body always has the potential to be multiple (Margulies 2021). When moving between and across species and realms, how much can existing concepts be transferred before they show their limits? How might an engagement with plants on their own terms make a difference to the way we imagine how cities are made, on what time scales, and by whom?

The theme of agency is further taken up in chapter 2, "Marginalia," with a focus this time on different types of knowledges about urban ecological dynamics, particularly plant dynamics. In this chapter, agency is largely about the colonization of interstitial spaces by communities of pioneer, or adventive, plants. It is explored through a multisited account of the emergence of concepts and approaches in urban ecological sciences. Reading that story, I continued jotting down questions: How differently would one think about plant agency in cities if one started to trace the diffusion of concepts from not only urban ecology, but plant sciences? In the past twenty years, plant sciences have played host to a variety of new developments, including ideas such as plant communication and memory, which disrupt conventional Western ideas about what it means to communicate, to learn, to behave, and displace the brain as the central organ implicated in intelligence (Pollan 2013). The field might not stand out immediately as relevant to urban critique, and yet I would argue that there are emerging signals suggesting that concepts derived from plant sciences are starting to make a difference to imaginaries of more-than-human cities. Understandings of what it means for a plant to live a good life are fueling attempts to make plants' lives in cities richer—from new street tree planting in the newly redesigned Rue Garibaldi in Lyon (France), where the model of trees individually planted in their own pit was replaced with street-long shared pits in which a multiplicity of trees, shrubs, and grasses share soil and live a joined-up life, to speculative thinking about the way Internet technologies could be channeled to help trees communicate in a fragmented urban environment (Galle, Nitoslawski, and Pilla 2019). Are these provocations just a new iteration of ecological simulacra? Or do they signal that different ideas about what plants are and how they live could inform new urban design practices? Is there a life for these ideas outside of the grip of capital?

Where the genre of urban political ecological critique tends to have single-case monographs (Gandy 2002; Lachmund 2013; Fredericks 2018) or case-study-based collections (Gandy 2014; Ernstson and Sörlin 2019) as its preferred formats, Gandy's book takes its readers across a range of different places. Some make recurring appearances, nurturing some degree of familiarity—Berlin, in particular, but also Paris, Brussels, New York, Chennai, or Los Angeles. Others are brought in to substantiate a particular point—such as Sheffield for its recent street tree controversy. Despite its broad-ranging spatial approach, the book partly shares its name with Gandy's (2017) Berlin-based film. Indeed, Berlin is a recurring locale—as a center of urban ecological knowledge production, a singular urban landscape, a terrain for experiments in non-design, and so on. In other terms, it is a global story that Gandy tells, but one that is informed by a close engagement with a specific place. It is a story told from somewhere. Gandy distances himself from the planetary urbanization thesis, arguing that "an overemphasis on methodological globalism risks obscuring the differences that matter in the articulation of alternative modernities" (p. 35). Yet I think there are some (productive) tensions between the critique of methodological globalism and the book's temptation to tell a story that can encompass cities as diverse as Los Angeles, Paris, Stoke-on-Trent, Sheffield, Mumbai, Chennai, Hong Kong, Singapore, and so on. If not methodological globalism, then how exactly should the approach be termed? What informed the shift in spatial register—away from the case study narrative structure of *The Fabric of Space* (Gandy 2014) toward a more free-flowing approach to spatial contexts? How differently might the book have been conceived had it been less informed by Berlin, and more by another one of Gandy's recent research sites, such as Chennai?

These are only a few of the questions that were spurred by my first reading of the book, but this is the kind of book you want to come back to. There are so many entry points. It makes new connections, and makes you think across regimes of knowledge, across species, and across space. I know it will keep me thinking for a while.

Response by Matthew Gandy, Department of Geography, University of Cambridge, Cambridge, UK.

This book review forum draws together four leading contributors to contemporary thinking about urban nature—Dawn Day Biehler, Julian Agyeman, Stephanie Wakefield, and Marion Ernwein. My remarks stem from both their written contributions and also the discussion held at the virtual American Association of Geographers conference

amidst the COVID-19 wave of early 2022. The COVID-19 pandemic itself has served as a kind of catalyst for thinking about different aspects of urban nature including the recognition of nonhuman others within the urban realm, the cultural significance of urban biodiversity, and more distant sets of relations associated with extractive frontiers, zoonotic transfer zones, and the epidemiological impact of capitalist agriculture. The question of urban nature now permeates many fields of enquiry as both a practical challenge and also a focal point for theoretical reflection, it is an arena of contestation that connects with global environmental challenges in relation to biodiversity loss, emerging health threats, and the escalating impact of climate change.

Dawn Day Biehler senses that *Natura Urbana* marks the culmination of an extended period of work. Indeed, my book appears almost exactly twenty years after my earlier exploration of what I termed "metropolitan nature" in *Concrete and Clay* (Gandy 2002), where I focused on the production of nature as a distinctive facet of capitalist urbanization. In *Natura Urbana*, by contrast, my emphasis is on spontaneous forms of urban nature and the emergence of new kinds of socioecological assemblages, with a particular orientation toward the unplanned, the unexpected, and the overlooked. Although my argument touches on aspects of designed nature and the recent impetus towards the "greening" of cities, I am repeatedly drawn to the independent agency of nature as an entry point into alternative cultural and scientific perspectives. Or to put it slightly differently, as Marion Ernwein observes, my emphasis here is not on the production of nature as a metabolic facet to capitalist urbanization, but rather on the parallel and often closely intertwined realm of nonhuman agency.

Biehler's comparison of my book with a "rich ecosystem" presents an intriguing analogy with its subject matter. In the period since *Concrete and Clay* was published, it is fair to say that the literature on urban nature has simply "exploded" as Stephanie Wakefield puts it in her contribution to this forum. My attempt to make sense of this vast, dynamic, and heterogenous field led me to eventually settle on a typology that highlights four main approaches: first, the dominant systems-based approach that emerged in the early decades of the twentieth century and has been extensively repurposed under the aegis of the adaptive Anthropocene with emphasis on themes such as ecosystem services and urban resilience; second, the observational paradigm, with roots in nineteenth-century botany and natural history, and now reworked within a variety of art practices, citizen science, and other fields; third, the urban political ecology approach that came to prominence in the late 1990s with links to radical strands of urban and environmental history, and is now undergoing a multifaceted set of empirical and conceptual reconfigurations (see Gandy 2022); and finally, the recent emergence of what I term the *ecological pluriverse*, marked by diverse constellations of agency, postphenomenological readings of affect, and growing interest in the ethical parameters of multispecies urbanism.

My book emerges from childhood recollections of "wastelands" in London—a fascination that I developed further through my research on the emergence of urban ecology in the "island city" of West Berlin, and subsequently on marginal spaces of nature in a number of other cities such as Chennai, Lille, Tallinn, and elsewhere. A particular theme of interest to me is the recognition of "cosmopolitan ecologies" as an ideological counterpoint to the persistence of nativist conceptions of cultural landscapes. I am very pleased that Julian Agyeman was able to participate in this forum because his early interventions on race, social justice, and the urban environment have been a formative influence on my own thinking. Agyeman notes how our shared childhood fascination with urban nature, including the spontaneous flora of marginal spaces, has left a poignant impression for our subsequent work. Of course, at the time that Agyeman was making his pioneering interventions with the Black Environment Network in the early 1990s, questions of race and ethnicity were almost completely marginalized within the parochial and often reactionary terrain of UK environmentalism. Agyeman's disquiet over the violent eradication of "alien plants," for example, under a nativist conception of conservation biology, has proved highly prescient. Indeed, just recently I received the Hackney Parks and Open Spaces Newsletter for May 2022, which encouraged the public to take part in the organized eradication of Himalayan balsam (*Impatiens grandulifera*) from the Lea Valley in east London. The removal of this attractive plant, a nineteenth-century garden escape, is described as "surprisingly easy and satisfying," but an odd priority in relation to the wider ecological impact of the 2012 Olympics and the generalized destruction of vibrant marginal ecologies to make way for speculative urban development.

Agyeman asks what the implications of my argument might be for pedagogy and professional practice. To what extent, for example, can the dominant systems-based approach be effectively challenged, let alone displaced by an alternative conceptual framework? He notes how the alternative field of urban political ecology lies a distant second within most university curricula, with its presence often dependent on the research interests of a few teaching staff. An alternative perspective on urban nature offers multiple possibilities for radical pedagogy including encounters with the "constitutive outside" of geography, planning, and cognate

disciplines. The term *outside* has a double connotation here involving both direct contact with aspects of urban field ecology but also strands of global history that have shaped knowledge about urban nature and the emergence of distinctive cosmopolitan ecologies in metropolitan areas. As for the realm of professional practice, there are evident tensions between my conceptual synthesis and the types of resilience-oriented paradigms associated with emerging fields such as ecological urbanism. Emphasis on generic ecologies in the service of capitalist urbanization is clearly very remote from the kind of site-specific urban natures that have been a long-standing source of cultural and scientific fascination.

By shifting the focus of my recent research from designed to nondesigned spaces of nature, the question of agency has been a recurring focus for theoretical reflection. There are tensions, for example, between expanded conceptions of agency and the historical and geographical specificities of racialized forms of environmental degradation. In articulating my analytical vantage point of the ecological pluriverse, I have been careful not to blur the distinction between different forms of agency. Stephanie Wakefield notes how my conceptualization of agency does not dispense with distinctive dimensions to human agency, thereby highlighting differences between my conceptual framework and some of the literature associated with new materialist and neo-vitalist approaches. Indeed, Wakefield's recent work has explored specific ways in which the agency of nature has been enlisted into the decidedly human project of the adaptive Anthropocene through the creation of living infrastructures within capitalist urbanization (see, for example, Wakefield 2019).

The extension of ethical concerns to nonhuman others forms part of a wider commitment to ecologically enriched forms of social justice. At the same time, we need to be alert to how the valorization of specific dimensions to urban nature can contribute toward racialized forms of capitalism, including the intersections between exclusionary forms of place-making and the wider impact of ecological gentrification. Wakefield asks how we might produce counterhegemonic forms of urban environmental knowledge. An intriguing question for me is the role of urban ecological imaginaries in articulating alternative futures to both the dystopian fatalism of much popular environmental literature and the instrumentalist discourses of (capitalist) resilience that regard urban nature as infinitely malleable. My argument also steers in a somewhat different direction from the emphasis on novel ecosystems as an alternative to specific forms of ecological endangerment in an urban context.

Marion Ernwein raises the intriguing question of how the "plantopolis" might differ from the "zoöpolis" given my intellectual entry point via Jennifer Wolch's (1996) classic essay on changing relations between animals and urban space. New scientific advances have shown how plants can form sophisticated living assemblages based on complex means of chemical communication. This recognition of the sociality of vegetal life is clearly very different from the kinds of phytosociological categories that have been used within "plant sociology" and existing forms of urban botany to delineate forms of ecological complexity or identify the presence of novel biotopes. Ernwein's emphasis on the body as a multiplicity resonates with postphenomenological insights into alternative configurations of agency as well as the queering of urban ecologies as part of a commitment to epistemological complexity. Similarly, the conceptual parameters of an extended ethical sensitivity toward nonhuman denizens of urban space remain ill-defined in relation to urban political ecology and other existing approaches within the literature.

Ernwein notes that I seek to distance my analysis from what I term *methodological globalism*, but wonders whether the geographical scope of my argument, which draws on many cities, is nonetheless seeking to make global claims. The productive tension with neo-Lefebvrian approaches that I elaborate on is derived from my emphasis on multiscalar dimensions to urban space, including distinctive aspects to the metropolitan arena as a realm of cultural and political deliberation. My critical reading of scale is derived from three main elements: a decenterd interpretation of global history that unsettles a series of teleological or essentialist narratives; a recognition of the limits to generic ecologies in relation to socioecological specificities; and a reticence toward overdetermined conceptual or theoretical tropes. The polycentric aspects to my analysis might certainly have been different if, as Ernwein suggests, I had altered the relative significance of disparate cities within my narrative structure.

In *Natura Urbana* I try to advance an alternative form of interdisciplinarity to the kind of forced epistemological unity that is characteristic of much of the systems-based literature. In particular, I have tried to articulate a conceptual synthesis for the study of urban nature that can incorporate insights from across the biophysical sciences, the social sciences, and the humanities. Emerging fields such as the environmental humanities already point to the potential for a radical combination of different disciplinary perspectives that takes both scientific advances and cultural criticism seriously. In writing this book I have drawn on a variety of cultural representations of urban nature, including literary and cinematic evocations of alternative ecological

imaginaries, to explore the shifting meaning and significance of urban nature. I have sought to expand the imaginative scope of urban environmental discourse by bringing disparate fields such as aesthetic theory, critical legal studies, and urban political ecology into closer dialogue.

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