



The Fabric of Space: Water, Modernity and the Urban Imagination

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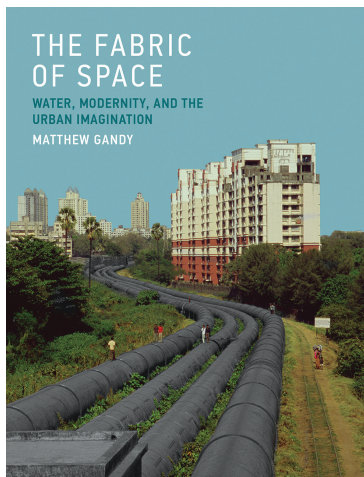
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BOOK REVIEW FORUM

The Fabric of Space: Water, Modernity, and the Urban Imagination

Matthew Gandy. Cambridge, MA: The MIT Press, 2014. x and 368 pp., notes, bibliography, index. \$30.00 cloth (ISBN 978-0-2620-2825-7); \$21.00 electronic (ISBN 9780-2623-2175-4).

Commentary by Austin Zeiderman, Department of Geography and Environment, London School of Economics and Political Science, London, UK.



find here.¹ With that in mind, I want to ask what sort of global history of urban modernity this is. Like all global histories, it is told from and about a set of somewheres and those somewheres influence what is seen.

This point is predictable, coming, as it does, from someone who works primarily in Latin America. The book, of course, does not intend to be a comprehensive history of a singular urban modernity: In fact, it aims to displace that very idea by offering “a more polyvalent set of developments that effectively decenters existing narratives of urban change” (p. 23). The six

I have had multiple opportunities to engage with Matthew Gandy’s *The Fabric of Space* over the past few years. It has been a privilege to have a sustained relationship with the project, to see it evolve, extend, and deepen over time. I have also had multiple forms of engagement with the book: as researcher and teacher, and as an inhabitant of one of the cities discussed in it. In my most recent engagement—as convener of this review forum—I would like to reflect on the book from these different perspectives. Let me start by saying that one of the remarkable things about *The Fabric of Space* is how extraordinarily generative it is across each of these domains.

As a researcher of urban environments and infrastructures who strives to weave together their cultural, political, and material dimensions, I’ve long found inspiration in Gandy’s work. This book goes beyond his previous projects in attempting to tell the history of urban modernity as a global history of uneven development. This is a point others have made before, but rarely with the nuance and sophistication, attention to detail, and breadth of scope, not to mention pleasurable readability, that we

cities in the book are windows onto different facets “of the relationship between water, modernity, and the urban imagination” (p. viii). Gandy is clearly not after a universal narrative of global urban history, where Lagos and Mumbai get folded into an already familiar story centered in the West. Nevertheless, he resists (for good reason) the easy out of “alternative modernities” or “multiple modernities” when discussing cities of the Global South. He retains the singularity of “modernity,” first, out of respect for the progressive political potential of that universalizing move, and second, in recognition of the fact that if we understand “modernity” as a myth containing a set of promises and expectations, its singularity is central to its hold over the urban imagination.

This leads me to remark on the book’s silence about Latin American cities. I do not mean this as a comment about inclusivity. Rather, what I have in mind is motivated by what Latin American postcolonial (or “decolonial”) thinkers insist is the impossibility of understanding modernity without its constitutive underside—coloniality—both

of which began with the European colonization of the Americas around 1500. The implication here is that Latin America is not simply another part of the Global South, and that Latin American cities are not just another set of postcolonial cities. Their history is different, as is their position in the world and their relationship to urban modernity.

My question, then, is this: What would *The Fabric of Space* look like and what would it tell us about water, modernity, and the urban imagination if it were to have a chapter on the hydrological history of Mexico City, the threat of floods and hurricanes to the slave-trading and gold-exporting hub of Cartagena, the boom-and-bust cities of Amazonia, or the port of Colón at the eastern entrance to the Panama Canal? Would sea water, the transoceanic trade of enslaved bodies, precious metals, and valuable commodities, and their constitutive relation to urban modernity figure more prominently? Would the dialectic of utopian and dystopian urban imaginations be more pronounced? I'm not sure. Perhaps this tells us something profound about modernity and the urban imagination: Latin America must remain implicit or invisible for stories of urban modernity and coloniality to remain intact, for it complicates both of them. What I am really saying here, though, is that I like the book so much that I want it to comment on everything, everywhere.

I recently had the privilege of giving Gandy's book to my students at the London School of Economics. I was teaching a course called Urban Futures, which sought to teach students to think critically about how the future of cities has been envisioned in different times and places. This experience revealed another of the book's remarkable features. There is no necessary distinction between future projections originating in the realm of scientific and technical expertise, those explicitly political in orientation, and those with artistic or literary origins. This does not mean that all projections are equally true or important, but that on some level we need to approach them as analytically equivalent and deeply entangled. Bringing these future projections into the same analytical field is a radical intervention, and it made an impact on my students. It is a simple yet provocative move that forces us to contend with the promises and predicaments of "urban ecological citizenship" in a world where the ideal of an "orchestra of specialists" or "cadre of experts" "working on behalf of a clearly defined public interest" is, as Gandy puts it, "superficially appealing yet increasingly anachronistic" (p. 221).

Gandy throws himself right in the middle of this complicated and contested discursive field. Throughout the book, there is no sharp dividing line between his authorial voice

and that of people prophesying catastrophe or purveying technical fixes (not that he's saying the same thing, but he's part of the same conversation). Gandy maintains a critical distance from the projections he analyzes, as we would expect, but he also takes them seriously. Around climate change, for example, all concerned, Gandy included, share a sense of urgency about the problems. The reader comes away convinced that they are real and serious. This is neither the problematization nor denunciation that we find in some critical urban studies and urban political ecology, nor is it straightforward advocacy and policy prescription.

My students got the message that their projections also mattered, and that they, too, would have to position themselves among competing visions of the urban future. Gandy does this subtly but not ambiguously: he is quite clear when he discusses "counterdystopian" projections that "present an avant-garde response to climate uncertainty as a space for reinventing relations between society and nature" (p. 211). Gandy argues that utopian flooding scenarios suggest "an optimism almost entirely lacking in much contemporary environmental discourse about human capacity to create a better future" (p. 213). There is no doubt that we had better concern ourselves with the unfolding socioecological crisis that is climate change, yet dystopian scenarios will not do. We still need to "imagine a better kind of human society" (p. 213). If there's one thing I wanted my students to learn, it was this, and I think the closest they got was in our discussions of *The Fabric of Space*.

I want to turn to another place I know less well than Latin America but better than the others discussed in the book: London. Since relocating to London a few years ago, I have been drawn to the watery landscapes of its east end. About a year ago, I moved to the Lower Lea River Valley. I now live a stone's throw away from (and less than a meter above) one of the river's many tributaries, a minor waterway called Dagenham Brook, and a short walk from ominous flood defense infrastructures, voluminous water supply reservoirs, disused filter beds, lively marshland ecosystems, burgeoning wetland restoration projects, and smelly wastewater treatment plants. Sometimes I wonder how, without knowing any better, I landed smack dab in the middle of Gandy's intellectual world.

Having settled in East London's floodplains, I am acutely sensitive to the concerns Gandy raises. I have studied environmental hazards for a while in Colombia, but I now find myself thinking about them in quite a different way. Gandy's discussion about the potentially dystopian, potentially utopian futures of inundated London are not

academic to me. They hit home in a very literal sense. When Gandy predicts that if London “really were to be flooded as [J. G.] Ballard describes [in *The Drowned World*], it would be mostly poorer communities in the east of the city that would first be inundated by rising water levels” (1962, p. 186). That’s my neighborhood he’s talking about.

Yet I am also sensitive to the fact that my neighbors and I do not appear in the book, at least not directly. This is true of the chapter on London, but the same could be said for the others, too: We get little sense of the quotidian social and cultural practices of the people who inhabit and produce these socionatural worlds, aside from a few key (usually rather noteworthy) people (who are mostly men). I say this not to question Gandy’s political sympathies or his methodological orientation, but rather to suggest that his book opens up huge swaths of terrain for future exploration. Put simply, there is more work to be done.

About a mile and a half north of my house is another important landmark in the book’s conceptual universe: the former home of the Victorian designer, writer, and radical thinker William Morris. The utopian socialism he famously invoked in his book, *News from Nowhere* (Morris [1890] 2003), is for Gandy “a radical critique of the social and environmental effects of industrial capitalism” (p. 209) that does not reject modernity, retreat from the city, or propose technological fixes. Morris’s efforts to reimagine the city as a socially and ecologically balanced world resonate, to some degree, with Gandy’s own vision.

Morris’s former home now houses a gallery, which showcases examples of his diverse body of work as well as that of contemporary artists. On a recent visit, I found an exhibition featuring Nigerian-British artist Yinka Shonibare, who re-created a number of photographs from Morris’s family album, juxtaposing the two versions. Shonibare was riffing on Morris’s profitable career as a textile designer by dressing his subjects in Victorian-era clothing made from Dutch Wax fabric. These fabrics are, of course, aesthetically “African,” yet originate as batiks from the colonial Dutch East Indies, eventually manufactured in European mills to be marketed and sold to African consumers. The subjects posing as Morris’s family members are current residents of the surrounding borough who Shonibare and the gallery invited to participate.

In this exhibition, we have four parallels with Gandy’s book. First is its focus on fabric, an artifact with both material and symbolic dimensions, which of course draws our attention to the etymological relation between textile and text. Second are the connections it makes between

modernity and coloniality as well as between radical critique (from the likes of Morris) and the material histories of empire. Third is the exhibition’s global scale, invoking histories of Indonesia, Africa, the Netherlands, Britain, and elsewhere in a single snapshot. Fourth is the people who inhabit and produce lived space, and their absence or presence in our representations of it. These concerns find parallels in Gandy’s book, but they also seem to speak back and pose questions to it.

Having engaged with *The Fabric of Space* as researcher, as teacher, as inhabitant of one of the cities discussed within it, and now as reviewer, I can say that I am truly amazed by its polyvalence. It is no wonder that the American Association of Geographers (AAG) awarded *The Fabric of Space* the 2014 Meridian Book Award for Outstanding Scholarly Work in Geography. In that spirit, the reviews that follow offer a critical celebration of a truly exceptional book. Like the best urban infrastructure, *The Fabric of Space* serves many different functions and each of them quite well. We need this kind of infrastructure as much as we need this sort of book. Our thanks go to the author for inspiring us all to create more of both.

Commentary by Nikhil Anand, Department of Anthropology, University of Pennsylvania, Philadelphia, PA.

Building on the accomplishments of *Concrete and Clay*, Matthew Gandy’s *The Fabric of Space* examines the cultural and material worlds of water in cities. Always and already ambivalent, water both makes and takes life, and participates both in the production and destruction of cities, urban infrastructures, and urban landscapes. Following both dangerous and vital waters, Gandy’s book attends, in particular, to the ways in which water is interpellated in and productive of the shifting relations among urbanism, modernity, and nature. By journeying through the past and present histories of cities as diverse as Berlin, Los Angeles, Lagos, London, Mumbai, and Paris, *The Fabric of Space* makes a series of generative interventions to the literature in political ecology, urban studies, and science studies. In the interest of brevity, I only detail three of the most compelling insights from my vantage point. First, the book demonstrates how urban water projects bound the city and differentiate social subjects within it. Second, *The Fabric of Space* attends to the slow, incremental processes through which water infrastructures are generative of public and private domains. Finally, the book’s careful treatment of water across time and space reveals how modernist imaginaries and projects of urban

water are always made incomplete by water's fickle flows, producing variegated landscapes and temporalities.

The Fabric of Space identifies ongoing processes of state formation by attending to different assemblies of water—sewers, pipelines, swamps, and rivers—across urban space over the last 200 years. It also demonstrates how cities are materialized through modernist projects to govern water supplies, sewers, and other waters, like those of rivers and swamps that lie along (or in) the way. Infrastructure projects to direct waters are both mundane and of enormous consequence. Drawing on the work of Barry (2001), Gandy shows how water infrastructures are “technological zones” that exceed their own political geography of the city. Conversely, as material networks distribute water and sewage within the city, they also differentiate urban bodies, often producing what Murphy (2006, 157) would call “elsewheres within [the] here's” of urban space; elsewheres not just in Lagos or Mumbai, but also London, Paris, and Los Angeles.

Here is the first and most immediate reward of reading *The Fabric of Space*. The book provides a wonderful example of comparative research, of how following Robinson (2011), one might study “cities in a world of cities.” Modernist projects to manage water are suitable units for comparing what cities and their residents do around the world. Thus the canalization of the Los Angeles River resonates with projects to manage the flooding of the Thames, and indeed also the Mithi in Mumbai, a river whose very terms of being are contested. Gandy notes how modernist responses to the water's uncertainties—uncertainties formed by urban infrastructures themselves (roads, infill, etc.)—produce “landscapes of disaster” in cities around the world. Water infrastructures, as they appear in the book, are a productive unit of comparison that allows us to examine the matter of politics with history, across place.

Second, Gandy makes a critical point in his review of the literature on water systems when he attends to the embodied experience of technological networks (Braun 2005). Cities, Gandy points out, are a palimpsest of water infrastructures; infrastructures that have accreted slowly and incrementally over the last one-and-a-half centuries. As these infrastructures permeate cities, they are generative of social and political practices not just in public, but also at home, in “private.” Here I am thinking of Gandy's careful treatment of indoor plumbing. Sanitary infrastructures in Paris emerge with discourses about the body and bodily practices. They are constitutive of the boundary between the public and the private sphere, and the practices within these domains. Yet Gandy is careful not

to let infrastructures determine social (or political) forms. He shows how the relations between water and its modern infrastructures are not neat and frictionless, nor are experts agreed on what water infrastructures can and should do. Instead, he points out that the relations between water and modernity are marked by tensions between different forms of expertise and different aesthetic orders. Water's politics are polyvalent, and Gandy demonstrates how this in part is because the “same” modern water systems carry different and often contradictory aesthetic and political forms at once.

This brings me to the third point that emerges from my reading of the book. Water infrastructures demonstrate the unstable terrain of modern linear time. As Gandy explains in the introduction to *The Fabric of Space*, the book's chapters have a chronological sequence. The book begins in nineteenth-century Paris, works its ways through Weimar Berlin, colonial Lagos, postcolonial Mumbai, and midcentury Los Angeles, and ends in the Londons of tomorrow. *The Fabric of Space* also unsettles this linear exposition of water, landscape, and infrastructure in the city, however. Each chapter is careful to demonstrate how we never have lived just in linear modern (or modernizing) times. An attention to the life of water infrastructures in *The Fabric of Space* demonstrates how time is also cyclical and multiple in the city. For instance, Gandy shows how the exemplar of the postmodern city—Los Angeles—continues to be contingent on the workings of modernist infrastructures managed by the Army Corps of Engineers even as it contemplates different restoration efforts in the present. The organic economy of premodern nature in nineteenth-century Paris is gestured to in renditions of London after the floods of the future. The book reveals how our imaginaries, stories, and projects of urban water are always compromised by the ways in which other temporalities interrupt (and are sometimes constitutive of) urban landscapes. The city, like its infrastructures, is at once formed in many times. The analytic payoff of this move is profound, because it compels us to recognize the ways in which the material politics of infrastructures past and present continue to matter to the political forms and possibilities for the future.

Taken together then, *The Fabric of Space* is a wonderful book that demonstrates how infrastructures are contingent accretions of aesthetics, matter, and politics. The diverse infrastructures that are treated in the book compel us, as readers, to open and expand our understandings of what infrastructures are and what infrastructures do. The book takes us through an exploration of infrastructures that are tied up with processes of state formation—of

postcolonialism, postmodernity, or both. Nevertheless, I wonder if we might also think about infrastructures that might exist alongside (but not encompassed by) such historic projects? For instance, might we think of the thousands of wells that percolate Mumbai's ground, as well as those of other cities (see Kooy and Bakker 2008) also as infrastructure? What might an attention to these infrastructures—infrastructures that sit alongside but not within the managerial rhythms of modernist states—reveal? How might we theorize these forms as not anterior to, or less desirable than, but with those modern pipes, dykes, and drains that are constitutive of states? Here I draw on Meehan (2013) and Furlong's (2014) work on infrastructural coexistence to suggest we think about modern water infrastructures with other water bodies that inhabit the landscape. To pluralize and provincialize modernist infrastructures in this way, I believe, is to further the project *The Fabric of Space* develops so evocatively. Thinking of modernist infrastructures in a field of infrastructures "provincializes" both the aesthetics of urban form and its political institutions (see Sheppard, Leitner, and Maringanti 2013). An attention to infrastructures that lie beside those of modernity might provide the tools to think about the future amidst the rubble of modernist projects, not just in Lagos and Mumbai, but also in the lost wetlands of Los Angeles or the organic cities of Paris.

To conclude, *The Fabric of Space* emerges from a careful and expansive reading of the aesthetics, politics, and technics of the city. Its attention to the incremental and slow life of infrastructure is a wonderful counterpart to the emergencies evoked by the languages of the modernity; languages of crisis that the Anthropocene is only the latest manifestation of. Slow, utopian thought, Gandy shows, has long been critical in the makings of landscape and infrastructure. It is by attending to infrastructure's aesthetics, and its compromised materialization, the book suggests, that we might not only think of new and possible figurations of landscape, but also more substantive engagements with the inequality that structures our cities of the future.

Commentary by Stephen Daniels, School of Geography, University of Nottingham, Nottingham, UK.

A lakeside city, Chicago, the location of the initial panel that led to this forum, proved an appropriate place to conduct this conversation with the book and its author. The preface of *The Fabric of Space* provides what is a key

passage to this scintillating book, a passage in both textual and territorial ways, to an adventurous intellectual and geographical journey through urban modernity:

If we trace the flow of water through urban space, the metaphorical and topographic dimensions to cities take on new and sometimes unexpected dimensions. We encounter not only entanglements between human agency and the material reconstruction of cities but also unpredictable aspects to nonhuman agency, such as the epidemiological dimensions to the different hydrological terrains of modernity or the unforeseen properties of construction materials. (p. viii)

Water levels in academic scholarship have been rising recently, as everywhere you look there are studies of the stuff in its various forms, environments, culture, and politics, across the spectrum of the arts and sciences—a veritable flood of research at times, in which so many issues flow, as a period of academic history I am inclined to call it the Aquacene.

Water is more visible in landscape developments, in the exposed infrastructure of modernizing cities of the Global South, illustrated by the astonishing book cover photograph of *The Fabric of Space* of great water pipes in Mumbai used as urban walkways. If it reminds a modern reader of the inside-out surface of Richard Roger's Pompidou Centre in Paris, it also recalls old prints of exposed water pipes snaking through the suburbs of eighteenth-century London, before such utilities were buried underground. We have been witnessing a postindustrial gentrification of the urban waterfront in many cities in the Global North, if, in its very regulation, this connects to the civic ideal of the plumbed city.

Gazing across the current academic waterscape, some familiar scholarly landmarks dissolve, and it sometimes hard to work out, on the map of knowledge, where we are. This is not so with Gandy's amphibious guide to urban exploration, or should we say navigation. We never lose sight of some familiar material and intellectual features—indeed structure as well as flow are key coordinates, material infrastructures as well as some theoretical and historical structures concerned with passages of modernity, not least the remapping of modernity through water power, both the power of the stuff itself, and the power of the various authorities who store and channel it. We are on the urban waterfront, in all its places and forms—standpipes and buckets as well as reservoirs and lidos, sewers and culverts. Each of the six cities in this book is seen through its characteristic infrastructure for water. The modern city, as a geographical formation, will never seem the same again.

Gandy's perspective, in present and past, is as a historical geographer of modernity, taking us back to the mentality of the modern city in the early twentieth century, to remind us how the very speed of urban technical and social progress also took observers back, to the elemental and primordial, to nature, the creaturely, and ancient mythology, the return of the repressed. I was delighted to see a reference to the great passage on water in James Joyce's ([1922] 1986) *Ulysses*, tracing the passage of municipal water supply through Dublin, in an exchange between Leopold Bloom, "water drawer, lover of water," who is filling a kettle to make the tea, and Stephen Daedalus, who distrusting "all aquacities of thought," refused it. As Bloom pours the kettle, Joyce describes the flow of water from reservoirs, aqueducts, and mains, to the turning tap, ranging far in space and time, with some send-up of geography books of the time, to take in capes and bays, cloudbursts, artesian wells, lagoons and atolls, watersheds, glaciers, and tidal estuaries, "its secrecy in springs, and latent humidity, revealed by rhabdomantic and hygrometric instruments" (p. 549).

The Fabric of Space is a model of border crossing, in terms of disciplinary as well as material territories, of periods and places, focusing on conjunctions of water and infrastructure, fluency and fixity. Water itself emerges as a mobile assemblage of processes, practices, and meanings. We never lose sight of the fact that water is a medium as well as a material, through which we can look, and reflect, on other matters in the making of modernity. I am interested to see that landscape is a key word for the book, as are representation and circulation. We are reminded how the history of landscape representation is writ in water, emerging, perhaps precipitating in watery cities like Amsterdam and Venice, and how much landscape is associated with liquidity.

I am reminded of some of the pioneering hydro-landscape work of Denis Cosgrove, particularly on Venice and its terra firma. Water and water power were central to Cosgrove's mapping of urban modernity in the sixteenth century, including the development of cartography and geography as forms of representation, but as in the Venetian landscape it is a medium and source for matters like food supply, disease control, capital and labor systems, and state formation. Cosgrove was keen to situate the practice of academic geography in a wider geographical imagination, so it is good to see geographers in Gandy's book, among the artists and writers, and two German geographers who are perhaps not familiar in the usual Anglophone genealogies of the discipline: Friedrich Leyden for the picture of Weimer Berlin, and for 1930s Los Angeles,

Anton Wagner, placing *Wasserfragen* (water questions) of both shortage and superfluity at the center of the city. It makes a refreshing change from Reyner Banham and freeways, interestingly a scholar of low humidity, a "dry" sensibility in both a medieval and modern sense, never more at home than in the desert, or in the drylands of his home in England's East Anglia, a scholar of concrete, not clay.

The itinerary of the book is fascinating, beginning in Paris and ending in London, almost as polarities of hydromodernity, one the rational planning of water control, and the hydrophilia of impressionist art, celebrating bathing and boating. In London, by contrast, every hydro-engineering scheme, from embanking to barriers, and every moment of Paris envy, seems undermined by fears and fantasies of flood, not so much from incoming sea levels as from rising groundwater. The more they were culverted, the more the Thames tributaries have haunted the imagination; the Thames barrier only serves to raise the specter of muddy flood, of estuary England. If central London is cosmopolitan, and perhaps more full of Parisians than it has ever been, estuary England, the marshlands of Essex, is the political front of English Europhobia.

A key city for me in the book's itinerary is Mumbai, the subject of a short film Gandy made in 2007 for the AHRC Landscape and Environment Programme I directed, a film titled *Liquid City*, produced in collaboration with the innovative nongovernmental organization Partners for Urban Knowledge, Action and Research (PUKAR). The voices of a range of people—activists, local residents, academics—combine with telling sequences of places in the city—giant pipes taking water to new suburbs passing over local mosquito-infested bodies of water in deprived neighborhoods; ancient stepped stone tanks, now used for recreation or ritual bathing, oases of symbolic purity in Hindu mythology; and tankers siphoning drinking water from reservoirs as part of the city's semicriminal "dark background," in a city now dominated by Hindu nationalism. *The Fabric of Space* further explores the politics and poetics of water in the hydrological regime of the city, from the legacy of a colonial regime that tried to impose a London or Parisian model of water engineering on a region experiencing the episodic hydrological cycle epitomized by the monsoon, to the emergence of an authoritarian Hindu nationalist regime symbolized by the renaming of the city in 1995, quoting de Bellaigue's (2000) description of how a "liberal city called Bombay" became "an ugly, disturbing shrine city called Mumbai" (p. 35).

Gandy wears his learning lightly as we cross continents, languages, and media (film, photography, design,

literature) and move from the archive to the field. The footnotes alone are a third of the book and have the joys of a parallel text. *The Fabric of Space* is a fine artefact, even an artwork, designed and made, not just with beautifully reproduced photographs, but with elegant topography and generous margins. In these days of digital publication, and the sheer misery of what is called “hard copy,” it is a pleasure to pick up, to read and read again. This remarkable book is a fine companion to a remarkable physical and intellectual journey.

Commentary by Jennifer Wolch, College of Environmental Design, University of California, Berkeley, CA.

Matthew Gandy's *The Fabric of Space: Water, Modernity and the Urban Imagination* is a superb book. Beautifully written, theoretically sophisticated, and based on meticulous scholarship, *The Fabric of Space* provides us with an acutely observed set of city case studies about urban water and water infrastructure. Urban political ecology is the frame for Gandy's narrative, and indeed this book stands as perhaps the most persuasive exemplar yet of the power of political ecology to illuminate the genesis, fabric, and trajectory of urban nature–culture relations. The book goes beyond this frame, however, to forge a new crucible for understanding the city, seamlessly integrating diverse strands of social theory, history and politics, physical geography, architecture, and urbanism. Building on the geohumanities turn, the book deftly includes art, film, and literature to give full-bodied texture and experiential meaning to alternative urban imaginaries around water, social justice, and biopolitics.

The Fabric of Space begins with the sewers of Second Empire Paris, highlighting the continuing cholera epidemics that plagued the city. Under the authoritarian regime of Napoleon III, Haussmann was mandated to redesign the city and build massive sewers to carry urban runoff to the Seine. The resulting infrastructure was a gleaming paean to modern engineering. Haussmann's urban incursions, despite their controversy and regressive impacts, utterly refashioned the city and marked the emergence of the technological sublime, as captured by Nadar's contemporary photography of the sewers. With rapid population growth, though, the Paris sewers eventually faced challenges they could not meet, not only because Haussmann refused to consider combined sewer system technology (leading to massive contamination of water supplies during heavy rains), but because sewage systems were woefully incomplete in terms of their geographic coverage.

Until the 1930s, no regional institution had the ability to rationalize the maze of water infrastructure or craft an approach to water management for the Paris metropolitan region.

Gandy next moves to Weimar Berlin, and the city's relationships to the region's lakes and forests. Noting the increasing industrialization of the urban labor force, as well as the lack of indoor plumbing in Berlin's working-class housing districts, Gandy recounts the efforts of key local planners and Bauhaus architects, such as Wagner and Gropius, and their ambitious modernization plans. These plans included provisions for recreation and public health promotion, in particular the protection of nearby lakes for working-class bathing and physical activity. The place of these lakes in the urban imagination is revealed through a discussion of a silent film, *People on Sunday*, written by Billy Wilder, focusing on responses (erotic and otherwise) of four young workers as they swim, walk in the forest, and interact with each other. Eventually, the lakes became civic battlegrounds, as the Nazis banned Jews and racial minorities from lakeside recreation, and used Berlin's lakes as places to perfect the Teutonic body.

Moving forward in time and to the Global South, Gandy examines Lagos during and following colonization. The colonial city expanded on the edge of estuarial marshes, leading to endemic malaria. Neither scientific experts nor colonial administrators understood the epidemiology of the disease. Eventually, in the wake of massive mortality among British soldiers stationed in Lagos during World War II, large swaths of swampland were drained, reducing mosquito breeding areas. The area's high water table and lack of coordinated underground sewerage systems, however, along with massive informal settlement growth, meant continuing high rates of malaria. DDT became widespread in the mid-1950s, cutting malaria prevalence rates, but by the late 1960s mosquitos had become pesticide-resistant, creating a biopolitical and public health crisis. Informal settlements were left to fester by the postliberation authoritarian state, or else removed, as described in such contemporary works of fiction as Nwosu's (2001) *Invisible Chapters*. Gandy concludes that periodic and ineffectual half-measures have left the city a patchwork of public, private, and informal water supply, and haphazardly designed informal settlements provide a wide array of breeding grounds for mosquitos. Malaria, once viewed as largely a rural problem, is an endemic urban public health threat.

Next, Gandy considers Mumbai. Here, colonial administrators were more successful in obtaining resources and orchestrating efforts to create a large-scale water supply,

wastewater, and flood control infrastructure. The politics of independence, ongoing sectarian and caste politics, and antiquated and corrupt bureaucracies, however, mean that contemporary administrations ignore maintenance of the city's water infrastructure. The engineered system has also failed to keep up with the unrelenting growth of the city. Mumbai's global city aspirations have led to massive upscale developments surrounded by informal settlements lacking infrastructure, where residents are summarily removed or relocated to make way for glittering hotels, condos, and office towers. The results are devastating: high rates of open defecation; victimization of women and scheduled castes forced to share massively overcrowded communal water supply and sanitation facilities; extensive water pollution and water-borne disease; and frequent deadly floods.

Gandy then turns to Los Angeles, long inhabited by native Californians, and then colonized successively by Spain, Mexico, and the United States. The 51-mile Los Angeles River was the original source of water for people, animals, and farmlands, with water distributed via *zanjas* or irrigation ditches. With the arrival of water from the Owens Valley and the Colorado River in the early twentieth century, the city grew rapidly, with factories, transportation and energy infrastructure, and residential areas built close to the river's banks. The Los Angeles River had never been well behaved and flooding was common; an enormous flood in 1938 spurred federal flood control projects. The river was channelized, evaporating as a topographical feature while becoming a symbol of alienation—for example, in the poetry of Luis Rodriguez, art works by Ed Ruscha, and Hollywood *film noir* classics such as *Point Blank*. Gandy's account highlights the changing biopolitics of the river and its radically shifting place in the public imagination—from concrete drainage channel to living river—stimulated by successive interventions of diverse environmental and community-based organizations. The tagline to the Los Angeles story is that its \$1 billion River Master Plan by necessity leaves most concrete in place, while spurring rapid ecogentrification.

The last stop on Gandy's journey is London. After recounting the history of the River Thames and its estuary, he notes the grim condition of many of nineteenth-century London's poor and working-class districts, as highlighted in literature such as Dickens's *Great Expectations* and other Victorian fiction. Eventually, advances in water infrastructure and sanitary engineering led to modern water service provision to the entire housing stock (a significant share of which lacked indoor plumbing well into the mid-twentieth century). Although domestic water

infrastructure was upgraded, the impact of ongoing estuarial drainage and expansive urbanization increased tidal incursions and risk of flooding. The solution was the beautifully designed Thames River Barrier opened in 1983 by the region's planning authority, the Greater London Council. The deployment of this massive barrage was seldom needed during its early years, but recently it has been utilized far beyond its design capacity. With the onset of climate change, and the potential for inundation reminiscent of Ballard's (1962) *The Drowned World*, proposals for a second and far larger barrage are being debated. Undeterred, land developments—not designed to withstand inundation—have continually encroached on unprotected estuarine areas lying beyond the Thames Barrier. Yet with the abolition of the Greater London Council by Margaret Thatcher, there is neither sufficient regional planning authority, public funding, nor political will for effective urban design and land use controls, much less a new barrage.

Throughout, Gandy argues that water and its technological retinues—scientists, engineers, and planners—have historically been a potent force in state formation and power, the evolution of state–society relations, and the dynamics of cities, often to the detriment of the urban poor. In so doing, he offers penetrating sociopolitical and technological analysis of both the possibilities and pitfalls of techno-modern water system engineering, and its contemporary and more overtly environmentalist counterpart, landscape urbanism. He carefully avoids deterministic conclusions, however, recognizing the current limits on the power of science, engineering, and planning to either frame or carry out large-scale infrastructural solutions. He also recognizes that despite the avowed importance of local activism and community participation in decision making around water supply and infrastructure decisions that have a profound impact on everyday lives and life chances, such activism faces real limitations given the sheer scale of infrastructure planning, design, investment, and construction needed by most major cities and metropolitan regions.

Gandy concludes with insightful discussions about catastrophic risks, the politics of discourse around resilience and adaptation, and the looming specter of ecogentrification as development and landscape urbanism partner to make the poorest people also the most vulnerable to climate-change-induced inundation. Moreover, he drives home the limited ability of the contemporary state—at any scale—to design, fund, and implement major urban water infrastructure despite a broad consensus on need. Even though privatization of water provision and

infrastructure has been largely discredited, state actors and regional agencies seem paralyzed and without the political leadership to articulate and implement public-sector solutions, however imperfect or partial.

Why should this be? Gandy offers less commentary about this issue, aside from observations about the pervasive influence of neoliberalism and loss of confidence in the modernist project. The current lack of state capacity to act, however, might also be linked to globalization and declining nation state power, widening inequality and a fading sense of shared circumstances, and profound skepticism on both right and left that government can efficiently or fairly carry out large-scale physical planning projects. Although the answer is no doubt complex and place-specific, there is a pressing need to move from theory to action. If not technomodernism, if not grassroots action, then what? This is the question with which Gandy leaves us, gimlet-eyed about the profound challenges ahead but empowered—by this innovative, penetrating, and elegant book—to more productively speculate about the possible futures of people, cities, and water.

Commentary by Erik Swyngedouw, School of Environment and Education and Development, University of Manchester, Manchester, UK.

Matthew Gandy's new book, *The Fabric of Space*, is a masterly crafted book that explores the uneven, fractured, and tumultuous geographies and histories, both material and symbolic, of modernity explored through the lens of water, infrastructure, and the urban. Drawing on a wide range of intellectual lineages that defy simple disciplinary classification, the successive chapters move seamlessly from the sociophysical reconstruction and performative reimagination of the relationship among the body, water, and the city, to the political ecologies of disease, normative models of urban socioecological cohesion around various infrastructural ideals, and the political economies of infrastructure. *The Fabric of Space* articulates the imaginary, the material-economic and sociocultural relations that unfold in and through the transformation of water, and it does so by whirling out from the most intimate of bodily affects and relations to the scale of the urban, the national, and indeed the global.

Through the excavation of the metabolic flow of water in a somewhat historical, but by no means merely linear, manner in a range of great cities around the world, the book demonstrates skillfully and seemingly effortlessly what has been elusive for so many years, namely

the articulation of the imaginary, the symbolic and the affective with the physical, material, and infrastructural. In doing so, *The Fabric of Space* demonstrates how modernity as a cultural process and modernization as an uneven and contested process of sociophysical transformation unfolds the urban process in both mesmerizing and deeply unequal manners. For me, the transforming fantasy space through which modernity was cast and recast suggests, following Castoriadis's great insight, the formidably performative political power—at a range of interlocking spatial and temporal scales—of fantasy in producing new connectivities between material and physical transformations and symbolic orders.

Although some of the chapters have been published as individual papers before, they have been thoroughly rewritten to make them both more accessible to a wider audience while adding texture, depth, and subtlety. Through these geographical expeditions, specific watery articulations in a wide range of cities at different times are quilted together in what feels like an almost seamless unfolding of the examination of how water becomes enrolled, engaged, transformed, reimagined, and sociotechnically harnessed in the contested and spatially and historically uneven and variegated trajectory of modernization.

It is really a book about cities, nature, and modernity in the twentieth century, both the pinnacle of the modern ideal and, toward the end, the allegedly terminal transformation of this ideal into something else, yet still very much affected by the controlling, transforming, emancipatory yet also disempowering desires that animated modernity from the very beginning. The book spans the entire twentieth century, whereby cities like Weimar Berlin, postcolonial Lagos, fragmented Mumbai, and the gentrifying reclamation (or rather reconstruction) of the Los Angeles River are sandwiched between the story of the making of the Paris sewers and the recurrent fears of overabundant waters in flood-prone London.

The book's urban analyses demonstrate how to weave together the symbolic, material, and social in relational ways that remain sensitive to fractures, tensions, and heterogeneities. It is precisely the sort of storyline that any aspiring urban scholar should use as a great example of how to undertake historical-geographical urban analysis. This book, therefore, is exquisitely theoretical without much explicit theory as the deep insights and unexpected turns, twists, and connections appear on every page: new connections among bodies of thought, theoretical perspectives, cultural conditions, and social relations appear and are mobilized to further enrich the layers and relations that shape the seemingly chaotic tapestry of urban modernity and the

modernization of its circulating waters. The theoretical is here put to work in a way that represents, explains, and accounts for the multiple relations among water, modernity, and urbanization, but does so in a grounded and deeply geographical manner. It is a book that puts theory to work in practice, as the empirical accounts enrich and transform our theoretical appreciation of the relationship among the social, the natural, and the urban.

Books like this, therefore, are rare and far apart, particularly in the United Kingdom, where the scholarly achievement of a monograph has been sacrificed on the altar of the quick fix of the journal article in the name of improving metrics and competitive academic juggling. It is the sort of book that, in addition to the pleasure of reading it and savoring the insights one gains in the process, one would encourage students and scholars to read.

Exasperated after doing a lot of theoretical reading, students often come to me in despair to ask, "How do I do urban political ecology? How do I, in my PhD or research project, show, analyze, or represent the articulations among the cultural, the physical, and material?" There is now one more addition to the small, but exquisite, urban reading list that I usually give to such aspiring scholars. It already contained Gandy's previous books, which find themselves in the company of David Harvey, Mike Davis, William Cronon, Maria Kaika, Donald Worster, and a few others that have taught us in their particular way how to represent urbanization, how to make sense of the urban condition of which we are part.

They quickly learn that the apparent ease of their writing and the seduction of their argument is the result of hard, scholarly work that welds together painstaking archival and other documentary work, a careful and skillful crafting of the essays and, above all, guided by an idea of how it might all hang together. This is precisely what Gandy has accomplished with *The Fabric of Space*. I was supposed to do a critical reading of it. I can't—I leave the critique to others to undertake.

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

The Fabric of Space brings together different aspects of my work on landscape, infrastructure, and urban space. At a structural level the book is arranged around a series of contrasting facets or episodes in the evolving relationship between water and urban space. A particular challenge

I faced in writing the book was how to draw together such a wide range of materials into an integrated narrative frame. Although the book is not a comparative study in a conventional sense, it nevertheless follows a loosely chronological frame with various cross-cutting themes and interconnected developments.

As I write my contribution to this AAG book forum, I am beginning new research in Chennai (formerly Madras) located in southern India. I am conscious of deploying what might be termed a mixed methods approach involving interviews, visits to study sites, the use of archives and specialist libraries, writing notes on everything (including later reflections on observations made during the day), reading local newspapers with their intriguing cross-sectional representations of everyday life, and taking photographs that might spur my imagination (my reliance on 35-mm color transparencies for *The Fabric of Space* has finally been displaced by the practicalities of digital images). I am already confronting many of the themes that I explored in *The Fabric of Space*, including the presence of hydrological dystopias: The Chennai floods of 2015, for example, left nearly half the city submerged and the wider social, ecological, epidemiological, and political consequences have yet to be played out.

Historical materialism, including insights from urban political ecology, continues to serve as a key focal point for my analysis, but there remain significant lacunae within this body of work. The epidemiological characteristics of contemporary urbanization, for example, remain extensively underexplored from a critical geographical perspective. The emerging threats of dengue fever, and most recently the Zika virus, draw attention to the microspaces of modernity and the production of new forms of human vulnerability that connect between disparate factors such as climate change, topographies of neglect, ramshackle housing, gender inequality, the shifting ecological dynamics of insect vectors, and the persistence of grinding poverty. In such scenarios, an interdisciplinary frame of analysis needs to capture not only different scales of transformation, but also diverse textures of cultural and material change: The similarities and differences between disparate locales such as Recife and Houston, for example, suddenly acquire urgent significance as part of a globalized space of modernity. The story of global capital is clearly not reducible to some form of neoliberal homogeneity. The city and its immediate environs remain a focal point for analysis rather than a mere manifestation of urbanized intensity.

I am delighted that Stephen Daniels locates my book within the historiography of the discipline, including

lesser known figures such as Friedrich Leyden and Anton Wagner, whose works have been largely overlooked within Anglo-American geography, as well as relating my research to the classic “hydrolandscapes” of Denis Cosgrove. Similarly, Jennifer Wolch sees the book as an argument for the continuing analytical relevance of political ecology within the urban arena as well as opening up new connections to the “geohumanities” and other emerging fields of interdisciplinary scholarship. For Wolch, the changing role of the state, and the possibilities for any coordinated or long-term interventions, become a pivotal political dilemma, and one that connects my study to other fields of environmental concern.

Modernity presents us with an analytical conundrum in terms of what lies beneath or beyond the more familiar periodicities of urban change. Nikhil Anand raises the theme of “infrastructural coexistence” and those artefacts, networks, and practices that operate alongside or in combination with the global reach of modernity. It is certainly the case that many cities, especially in the Global South, exhibit a complex array of sociotechnological entanglements and many of these hold continuities with premodern cultural and material elements. Anand also highlights the need to “pluralize and provincialize” infrastructure to include wells or other features in the urban landscape that do not fit within more narrow conceptions of “modernity” and the development of technological networks. I hope that I have presented a nuanced reading of modernity that signals some of the limits and contradictions to our conceptual vocabulary but I would be wary of abandoning the term altogether because I have not yet encountered a better alternative (notwithstanding the current hullabaloo over the Anthropocene or even Daniels’s laconic reference to the emerging Aquacene).

The structure of the book necessarily raises questions in terms of its geographical emphasis and analytical vantage points. Austin Zeiderman rightly asks what kind of “global history of urban modernity” this might have been if I had included a Latin American city in my analysis. The inclusion of an example from Latin America, or East Asia for that matter, would have made the text undoubtedly richer, but also rendered the book longer and more difficult to complete. My reading of the postcolonial experience might well have evolved somewhat differently through the inclusion of further cities, or at least encountered a further layer of nuance or complexity, but Zeiderman recognizes that I am not seeking to offer a universal narrative. Picking up a similar line of argument to Anand in relation to our understanding of everyday life, Zeiderman suggests that I could have engaged more with

“quotidian social and cultural practices” as part of my research strategy. This might, in part, reflect my interest in the intersections between infrastructure and landscape, or in other words those instances where the everyday becomes framed by different forms of cultural representation, as well as my reliance on a diversity of ethnographic observations rather than a sustained period of time in a single locality.

I am pleased that Stephen Daniels and Erik Swyngedouw pick up on the changing context for academic publishing—a theme that greatly interests me—because geography needs to produce books to bolster its disciplinary standing in relation to anthropology, history, sociology, and other fields. Of course it is difficult to be certain whether a book will have any lasting influence within geography or cognate disciplines—this can take years to ascertain—but specialist journals rarely reach beyond a relatively narrow readership (with the possible exception of some open access science journals). The institutional context for writing books has become more unfavorable, especially in the United Kingdom, where narrow conceptions of value, short-term managerial and evaluative frameworks, and multiplying pressures on academic life can provide a formidable array of obstacles. Furthermore, the divergence in business models, editorial and design input, and the wider strategic objectives pursued by different publishers remain little known in much of the academic community. I have been very fortunate to work with the MIT Press on two book projects now, which has enabled a degree of continuity (including the same editor on both occasions), and even the opportunity to express preferences in terms of fonts, layout, referencing, and other basic design features.

It is my intention that *The Fabric of Space* will serve as the second volume in a loosely connected trilogy of works on urban nature: My next book will be on the theme of urban biodiversity (I now feel that *Concrete and Clay* had a missing chapter that might have focused on Jamaica Bay to explore different conceptualizations of urban ecology). An ornithological excursion to Central Park in the winter of 2012 also added to my sense that there is a world of urban nature that I had simply overlooked in my previous work. It is no accident that my first direct encounter with Chennai this year, as part of a new research project on urban nature, involved meeting bird watchers at the Pallickaranai wetlands on the outskirts of the city. There is already a hint of this swerve toward nature in *The Fabric of Space*—notably the egret that I encountered in south London one winter morning that became the starting point for writing the book’s epilogue.

Note

1. In his article, "Learning from Lagos," in *New Left Review*, Gandy (2005) reminded us, and Rem Koolhaas, that "every extremity of Lagos's deterioration over the past quarter century has been linked, in inverse proportion, to the capital accumulated in Chicago, London or Los Angeles" (42).

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