1. Introduction

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AN ENVIRO-URBAN CRISIS

On 1 April 2015, Governor Jerry Brown of California signed an historic executive order, establishing water usage restrictions as a state-wide policy in response to an ongoing historic drought in this US state (Executive Order B-29-15, 2015). The drought in California was not a new phenomenon. Officially beginning in 2011, many municipalities began restricting water usage by 2009, particularly in the Central Valley and the Metropolitan Water District of Southern California (Kahn, 2009). At that time, however, it was assumed that the drought was a temporary occurrence. Unfortunately, that proved not to be the case. Snowpack, a major source of surface water supplies, was at 3 percent of normal as of May 2015 (Scott and Lindsey, 2015). Reservoirs, including the largest reservoir in California, Shasta Lake, have continued to rapidly dry up. While the winter of 2014–15 was relatively wet by California standards, and another wet winter was predicted for 2015–16, the result is a furthering of existing severe drought conditions.

An additional wrinkle in the current water situation in California is the legal right to water as a public welfare resource, as codified in the California State Constitution. Article X, Section 2 specifically delineates water rights, stating that:

[. . .]water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare. (CA Const. Art. X, §2)

Hence the executive order, responding to the current crisis of an essential natural resource. This crisis, however, is one that highlights the “socio-nature” of California as a whole. This is nature designed and/or defined by human intervention and human interaction, rather than some pristine Othered “wilderness,” itself framed and defined by human perception (see Chapters 2, 3, 4, and 14 for a more detailed description of the notion of socio-nature). Seeing the environment as so constructed by humans allows for the recognition that the production of socio-nature in California has

reified a particular narrative around resource usage, which has then had direct consequences on the perceptions of (and actually implemented) resource usage over time.

Take, for example, the role that eco-austerity, or the application of austerity economic practices to a necessary natural resource, is currently having in California. By the executive order noted above, cities have been required to reduce their water consumption by 25 percent within a year (by 1 April 2016). Urban water usage, however, represents roughly only 17 percent of the total water usage in the state of California (USGS, 2014). In addition to this, urban per capita water usage in California has been falling since well before the restrictions were put into place; per capita urban water usage in California cities was already below the usage rates for 1960 (Hanak and Lund, 2015). In fact, from 2005 to 2010, water usage across the state (and across all uses) had already declined by 17 percent (USGS, 2014).

With urban water usage already declining and representing such a small percentage of the overall water usage in the state of California, it seemed odd that cities were singled out in this executive order. The singling out would continue by commentators – one such example was then presidential candidate Carly Fiorina, who stated that “California is a classic case of liberals being willing to sacrifice other people’s lives and livelihoods at the altar of their ideology. It is a tragedy” (Ritz, 2015). First, Fiorina references “liberals.” This seems an odd choice, considering that little was done in the state legislature or by the state governor when conservatives held more power in the years leading into the current drought conditions. The second caveat is who Carly Fiorina laid the blame squarely upon – “liberal environmentalists” (ibid.). In her mind, the drought was the direct consequence of decades of environmental policy, keeping water rights out of the hands of economic interests, and instead supporting non-human environmental interests. Many pundits would go on to claim that the urban water restriction does not go far enough – but remained strangely silent on the usage by agribusiness and other corporate enterprises. According to Devin Nunes (2015), it is patently unfair to blame agricultural uses for water issues – again, it is a problem of water usage for largely non-human “environmental interests.”

Yet, this is a very strange position to take, considering the use of water for commercial and agricultural purposes in the state of California. For example, it was revealed over the spring and summer of 2015 that many corporate water permits had expired. The most famous example in the spring of 2015 was when it came to light that the Nestlé Corporation, which includes such bottled water brands as Arrowhead, Deer Park, Poland Spring, as well as Nestlé Pure Life, continued pumping water for

bottling and selling, often for markets outside the state of California, when its corporate water permit had expired in 1988 (27 years earlier); by October 2015, the US Forest Service would be sued for allowing the pumping to continue (James, 2015). The reliance of water-intensive agricultural products was also never questioned. For example, one of the most water-intensive crops harvested in California is the lowly almond, which requires an average of 1.1 gallons (5 liters) of water *per nut* to produce (Mekonnen and Hoekstra, 2011); while the rest of the almond, such as its hull and shell, are also used in production, this represents a substantial use of water. In fact, almond production currently uses roughly three-and-a-half times as much water as all the residential and commercial water usage in Los Angeles (Lurie, 2015).

In true neoliberal fashion, this is an example of free markets regulating a (natural) resource in the singular pursuit of capitalist growth. Agriculture would finally get watering restrictions of its own, but as senior rights holder (and the primary user of water in the state) its restrictions are less than those of junior rights holders – and senior rights holders can also sell their rights to more junior rights holders (Dobuzinskis, 2015). In short, the rapidly shifting dynamics of urban eco-austerity, as shown in the case of urban water rights in California, are further entrenching an unevenly developed, inequitable socio-nature in the state and contesting rights to the city, as well as rights to basic, necessary resources to support human life.

MAKING THE CASE FOR CITIES AND THE ENVIRONMENT

The case of urban water restrictions in the state of California highlights the oft-times uneasy and complex relationship between cities and the environment. Now that the majority of the world's population live in cities (see below), any discussion of environmental issues must address the relationship between cities and the environment. And yet this has, even recently, rarely been the case. Whether the discussion concerns resource consumption, pollution, or climate change, cities and city-people are often ignored or vilified as the cause of the problem – lending a certain anti-urban bias to much of what passes for environmental politics. Even urban-based environmental activists often focus on creating whole new city-spaces (often no larger than a small town or large village) that are isolated and self-enclosed in their supposed sustainability, rather than treating the environmental issues arising in cities that already exist, in the here and now.

This handbook seeks to reorient this environmental discussion by

addressing the relationship between cities and the environment as its central focus. The twenty-first century will be an increasingly urban one and what this growing human population in cities makes of their environment will be the main environmental issue across the globe for the foreseeable future. It is therefore imperative that we know much more about the precise relationship that exists between humans and non-human nature in cities and their environs. The chapters that follow thus include varying theoretical takes on the environmental implications of our urbanizing present and future as well as more localized case studies of emerging, and likely to emerge, city environmental issues.

The World's Socio-nature at Risk

February 2016 was the most unusually warm month ever recorded (NASA GISS, 2016). In addition to this measure of temperature deviation, February also holds the record (as of this writing) as the warmest month ever recorded. Temperatures for the month were 2.18°F (1.21°C) above the twentieth-century global temperature mean (*ibid.*). This has been an uneven warming, with the Northern Hemisphere, particularly in the Arctic region, most affected. This, while the Northern Hemisphere and the Arctic were still in their winter season.

While it is far too soon to determine if this is a shift in the climatological pattern, the signs are not promising. As of this writing “the six highest monthly temperature departures in the record have all occurred in the past six months. February 2016 also marks the 10th consecutive month a monthly global temperature record has been broken” (NOAA NCEI, 2016). That this is occurring on the heels of the 2015 United Nations Climate Change Conference (or COP21) has already been noted (Mckie, 2016). COP21, held in Paris early December 2015, is the latest attempt at achieving a global climate agreement, one in which all countries in the world actively participate in attempting to mitigate the consequences that the high temperatures currently experienced and reduce the likelihood of yet warmer temperatures becoming the norm. The Paris Agreement is being touted as “the first-ever universal, legally binding global climate deal” (EC, 2016). The agreement will open for signatures on 22 April 2016, and remain open for one year; it requires a minimum of 55 signatories representing a minimum of 55 percent of the global emissions output during this period for ratification (UNFCCC, 2015, p. 31). Once ratified, its mitigation, planning, reporting, and accountability requirements will enter into force in 2020, five years after its proposal for ratification (*ibid.*).

The Paris Agreement and the record temperatures in February 2016 both represent the other primary issue of the twenty-first century:

humanly constructed environmental change. Sometimes referred to as the Anthropocene, a term popularized by Crutzen and Stoermer (2000), called by others the Capitalocene (e.g., Moore, 2014), we continue to see an acceleration and intensification of the impact of human activity upon the global environment. It represents the active role humanity has played in (re)producing and (re/de)constructing complex global environmental relations – as well as this relationship occurring at other scales. There are few, if any, natural spaces that can be legitimately claimed to be free from any human impact; any claims to the contrary are suspect. We have become a natural force to be reckoned with in our own right as humans.

The World as a City?

In 2009, for the first time in human history, more humans lived in cities than outside them (UN, 2009). By 2014, it was estimated that 54 percent of the global population lived in cities (UN, 2014). Most cities in the world, particularly cities outside of North America and Europe, have rapidly increased in size since the beginning of the twentieth century. For example, in 1900, São Paulo, Brazil was a city of roughly 240 000. By 2015, São Paulo had over 20 million people living in what is now the largest city in Brazil, and one of the largest cities in the world. This represents urban growth of over 8200 percent in a little over a century. São Paulo is representative of a global dynamic that has only intensified in recent decades – the rapid urbanization of the world.

This urbanization trend is predicted not only to continue, but also to accelerate, in the coming decades. By 2050, it is estimated that 66 percent, or two-thirds, of the global population will live in cities (UN, 2014). Depending on which population projections are used, this potentially represents as many people living in cities in 2050 as the total global population in 2015 (estimated at 7.349 billion; UNFCCC, 2015). This urbanization process is expected to continue on its unevenly developed trajectory: Asia and Africa are expected to see the fastest and largest increases in urbanization, with much of that growth concentrated in China, India, and Nigeria; North America, Latin America and the Caribbean, and Europe are expected to still see modest gains, but these regions have already been urbanized for quite some time (UN, 2014). The size of cities also varies greatly, from megacities with populations of ten million or more, representing roughly one-eighth of the global urban population, to cities with less than half a million residents, representing roughly half of the global urban population (ibid.). In other words, the future of humanity is centered squarely in the city.

India is proving to be illustrative of this rapid urbanization, and the

social, political, infrastructural, and economic needs that arise from such a large-scale population expanding in the city. The national government is in the process of creating/retrofitting 100 “smart cities” over a five-year period, in an attempt to plan for and proactively support this rapid urban growth. These smart cities will act as places to concentrate the anticipated massive acceleration of rural-to-urban migration and urban population increase that India is experiencing (Government of India, 2015). This attempt at meeting the future city needs of India in time for those needs to be a reality could well represent the largest infrastructural plan in human history. This trend is expected to continue for the foreseeable future – which means that such projects, already at a scale unthinkable a few decades ago, may become the new normal.

While India is attempting to meet its urbanization needs, existing cities such as Mumbai and Kolkata are increasingly at risk to climate change vulnerabilities, including flooding, wind damage, and rising sea levels (Nicholls et al., 2008). Representing two of the highest urban gross domestic products (GDPs) in India, as well as two of the largest cities based on population in India, it is estimated that together they represent a climate risk that will impact an estimated 25 million people and an estimated US\$3.6 trillion in assets over the next half-century (ibid.). The relationship between humans and their environment will take place within the context of, and often directly within, their cities, particularly within the context of the socio-natural impacts of global climate change. In the end, with this majority of the population living in cities, we contend that there can be no discussion of the environmental issues facing the planet, and facing humanity, without also keeping the city front and center in these discussions.

The City–Environment Nexus

And yet so much of our conceptualization of the environment presupposes a nature that is disconnected from the city, that is not only outside the city spatially, but also outside the city conceptually. Participation with nature is seen as something that is not accomplished in cities, aside from the (constructed) nature of parks – or bringing nature back to the city, yet still treating it as Other. Yet this disconnect is artificial. The relationships between cities and the environment are far more nuanced, and more dialectical, than this opposition would suggest. The environment has always been a part of, and impacted, the city; the city has always impacted, and been dependent on, the natural environment. This is described quite clearly in the work on urban political ecology (e.g., Moulaert, 2000; Swyngedouw and Heynen, 2003; Rademacher 2015; see below). Furthermore, the idea

of the environment as socially constructed is not a new idea; nor is it a new phenomenon (e.g., see Eder, 1997; Gerber, 1997; see below). As noted above, the nature that humans typically interact with is socio-nature. Much of this social construction is now occurring from and within cities, since this is where most of humanity now resides and perceives, interacts, and (re)produces their environments.

This book is about the integration of the city and the environment. It is premised on the idea that the environment is the number one concern of humanity in the twenty-first century, and that this concern will be impacted by, and impacting most, cities and city people. Some key questions for our global urban future are: What type of relationship do we want to (re)create between cities and the natural environment? Is the future of this relationship one of eco-austerity, as evidenced in the California example discussed above? Are cities to become casualties to global environmental concerns, similar to that mentioned with regard to Mumbai and Kolkata above? Or will cities and their residents become partners and leaders in addressing the relationship between what we contend are the two most important issues facing humanity in the twenty-first century: overly rapid urbanization and worsening environmental degradation, including human-induced climate change?

THE STRUCTURE OF THIS HANDBOOK

As editors, we attempted to cast a wide net, thematically, from more abstract framings to more empirically based treatments of cities and the environment. Our goal was to have a diverse combination of more politically oriented commentary with more applied city planning and design discussions. In turn, we sought to include a good mix of newer authorial voices with those more known in order to provide both a sense of evolution in the city–environment discourse but also to open this discourse up to possible new directions and topics to address. In the end, we are pleased with how well our authors responded to these editorial desires and believe that this handbook goes quite some way toward portraying the many diverse facets of the relationship between cities and the environment. In fact, it is clear from the results of this project that there is still a lot of work to be done in this area of such significant concern for the present and the future. It is our hope then that this handbook serves as a good foundation from which this future work on cities and the environment can build.

In Part I, “Theorizing the production of city environments,” the historically evolving relationship between cities and the environment is theorized as combined ecological–human processes at multiple levels and sites. This

includes addressing how the urban environment has been defined, as well as the relationship between the city-people and non-human environments. The main theme in this part is that cities are unique hybrids of social and natural processes whereby human constructions should be considered as much a part of the “environment” as non-human nature. Considering cities in this way, this thematic argument suggests, allows for a better understanding of what it may mean to be more or less environmentally sustainable, both within the city and between the city and whatever the countryside is considered to be, locally or, indeed, globally.

In Chapter 2, for example, Short provides a broad survey of the “historical connections between Nature and the City” as general themes instead of specific objects of study. Maintaining that the distinction between cities and nature is a “false dichotomy” and even that the “City” actually “produces Nature,” Short identifies five broad themes, more rhetorical than empirical, that correspond to the “sweeping historical trajectory” of urban socio-nature. These are what he calls “Nature Incorporated” where city residents “create and incorporate Nature in different ways”; “Nature Planned” in the form of “garden suburbs and city parks”; “Nature Overcome” as the rise of the premodern and modern city and the quest for “mastery of Nature”; “Nature Reclaimed” as more contemporary efforts at “greening cities”; and, finally, “Nature of Cities” where he discusses how cities are “inherently natural.”

Swyngedouw and Kaika, in Chapter 3, decry the fact that, even with all the current discussion about urban greening and sustainability, ecological degradation on a planetary scale continues apace. Their theoretical piece considers the city as a “socio-spatial process” the functions of which “are predicated upon ever longer, often globally structured, socio-ecological metabolic flows that not only fuse objects, nature and people together, but do so in socially, ecologically and geographically articulated, but depressingly uneven manner.” The question they address then is not nature in the city, or city nature, but rather what they call the very uneven “urbanization of nature” in which “all types of nature are socially mobilized,” commodified, and “physically metabolized/transformed in order to support the urbanization process.” Viewing cities this way, they argue, is the best means to understand how city socio-nature is constructed unevenly and inequitably and, then, how it may be deconstructed/reconstructed more evenly and equitably, if there were the political will to do so.

In Chapter 4, Karaliotas and Bettini take up more specifically the notion of the “Anthropocene” as the new, human-dominated geological age that the previous authors also mention in passing. Drawing on the field of urban political ecology, they consider two main questions: “[What] are the significance and import of the Anthropocene for urban (environmental)

politics? And what are the role and limits of *local* urban interventions and initiatives in the unravelling of the politics of the Anthropocene?" In the end, they argue, there needs to be a "dislocation of the society–nature and rural–urban binaries" so often considered as sacrosanct in order to obtain a proper "understanding of the intertwined politics of the Anthropocene and urbanization" across the planet.

Part II, "Designs for the city environment," explores different conceptions and models for designing and interpreting the design of environments both within the city and between cities and the countryside. Such urban design requires an integration of human and non-human environmental considerations and praxis. To be sustainable, it also requires a holistic approach to envisioning future trajectories of the anthropogenic relationship with non-human nature. The key theme in this section is thus how it may be possible to design urban socio-natures in a more sustainable manner than presently, particularly given the overwhelmingly urban future of the planet's human population.

In Chapter 5, for example, Pizarro works toward a comprehensive theoretical model for sustainable urban physical design by considering American and European attempts to produce more sustainable cities. By highlighting the similarities and differences of such projects, he aims to build a more general theory of city sustainability that would apply to cities worldwide. The resulting theory considers sustainability as a composite of seven main elements: "bioregionalism, urban form, land use, density, mobility, green infrastructure," and "open space biodiversity networks." The chapter then goes on to elaborate on all of these elements and how they might fit together in a more comprehensive plan to actually attain sustainability via the better design of the physical form of cities.

Ravetz, in Chapter 6, follows along this path with a discussion about planning city sustainability in general or how "one person's sustainable future utopia appears to be another's dystopia," a similar point to one made by Swyngedouw and Kaika in Chapter 3. In this rather ambitious chapter, Ravetz introduces what he calls a "structured approach" to planning for sustainability with the goal of providing a more holistic planning process based on a few main propositions: "landscape mapping," as a broad, critical survey of how ecological services "can be shaped by social, technical, economic and political forces"; "change mapping," as a critical survey of "current trends and driving forces," that "point to a wide range of possible futures" for cities, both positive and negative, as well as for different types of cities; and, finally, "synergy/pathway mapping," as the development of what he calls "combined pathways for action" toward more sustainable cities based on the findings of the first two mappings. Overall, Ravetz seeks to "look beyond the now-conventional thinking of

many sustainable city studies” because the “‘sustainable urban future’ is not so much about checklists, but more about the capacity to learn, think, create, and adapt.”

In Chapter 7, Guibrunet and Castán Broto consider the very important topic of economic informality in poorer cities of the world and how such informality affects urban socio-nature. As they put it well and succinctly, “(i)nformality is not an exception but something routinely found in cities in different guises, not in opposition to formal systems, but in relation to them” particularly as the central reality in the most rapidly growing cities of the world today. And yet, to their mind, “informal practices are most often overlooked in environmental research.” In fact, they consider the lack of focus on informality as “the biggest gap between current academic understandings of the urban environment and the material realities of urban life.” Seeking to partially fill this gap, the authors focus squarely on it with examples from several cities and within an overall theoretical framework of “urban environmental metabolism” similar to what was introduced in Chapter 3 by Swyngedouw and Kaika.

Part III, “Climate change and city environments,” focuses primarily on empirical research on current issues surrounding cities and climate change. Case studies include the role of regionalization in providing urban governance to better respond to climate change; the capacity of governments to respond to climate change in large, vulnerable urban spaces; and an exploration of the potential impacts of urban flooding in coastal cities, as a direct result of climate change. Case studies from cities in both the Global North and the Global South are included, to showcase converging and diverging issues, and converging and diverging approaches to the urban environment in the face of such global ecological change.

In Chapter 8, for example, Friend and Thinphanga consider the rapid urbanization and industrialization taking place in the formally rural, agricultural, multinational region of the Mekong and how climate change interweaves with ongoing regional economic integration of the area. They adopt what they call a “complex social-ecological systems perspective” to make sense of the “interlinkages and interdependencies of biological, physical and social processes” of the Mekong and “the ways in which cities are linked to each other, and to their rural hinterlands.” They conclude their chapter by proposing an interdisciplinary research agenda to better get a handle on all the various aspects of the relationship between cities and climate change.

Wilson and Smith continue the conversation about the effects of climate change in Chapter 9 by underscoring that it is particularly urban areas in low- and middle-income countries that are most vulnerable to such change. With high rates of urbanization, generally poor urban planning,

high rates of poverty, and gaps in public services and infrastructure, such cities overall are not positioned to withstand well the potential hazards that climate change is likely to present. Focusing on Africa, Wilson and Smith examine the capacity of local government to “prepare for and respond to climate change and climate-related hazards” with regard to national-level government planning. They focus particular attention on ten major cities: Accra, Ghana; Alexandria, Egypt; Cape Town, South Africa; Casablanca, Morocco; Dakar, Senegal; Dar es Salaam, Tanzania; Johannesburg, South Africa; Kampala, Uganda; and Maputo, Mozambique.

In Chapter 10, Houston considers how “[u]rbanization and climate change are both serving to increase flood risk in many parts of the world” and therefore how “[c]ities are crucial in understanding flooding and its consequences” overall in a time of such change. With a case study of urban areas in Scotland, he seeks to compare and contrast “vulnerability analysis” of flooding hazards with its emphasis on ameliorating socio-economic inequalities via the “redistribution of resources” with what he calls “justice analysis” with its “more specific and immediate recommendations in terms of governance, regulations, and practices.”

Part IV, “Urban sustainability in the United States,” presents approaches to urban sustainability and ecological restoration occurring in the United States. This is not to exceptionalize US approaches as examples of “better” or “preferred,” but instead as a nod to the rather unique, little-regulated relationship between cities and the environment in its national history, perhaps as a harbinger of a neoliberalizing global future of such. American exceptionalism as an ideal represents potentially grave consequences for the rest of the global community, in regard to its relationships between cities and the environment, if other cities begin to follow similar models of consumption and (post-)industrialized socio-nature. Case studies in this part include urban sustainability plans and the role of green space in sustainability planning; sustainability policies and political ideologies concerned with environmental stewardship, governmentality, and urban ecological restoration; and the relationship between visions of non-human ecological restoration and the management of socio-nature in cities. These case studies document both new approaches to the relationship between cities and the environment and more cautionary tales about the success, or non-success, of such.

In Chapter 11, for example, Portney and Berry try to sort out the effects of environmental group advocacy of sustainability policies in major cities across the United States from what they call the “underlying political ideology” of each city. According to them, significant investments have been made in most major US cities in recent years. The key is to determine what actually drove such investments in adopting and implementing

sustainability policies and programs at the city level. Considering this issue to be a gap in the policy literature to date, Portney and Berry present results from two broad surveys of local officials in 50 of the largest 54 cities in the United States. As they put it, the “central analytical question underlying this research” is the role of environmental groups in “influencing cities to adopt and implement policies and programs in pursuit of greater sustainability.”

Benton-Short, Keeley, and Rowland continue this look at sustainability policies at the city level in the United States in Chapter 12 via a specific focus on how what they call “green spaces” are maintained or otherwise protected for sustainability purposes. Along with many other authors in this collection, they maintain that “sustainability” is a “contested and malleable term” and, because of this, the fact that there is “no national mandate to create a sustainability plan” and guideline establishment is only in very early stages of development, city officials are prone to interpret sustainability in multiple ways. The authors’ goal, then, is to answer the broad question: how have issues of urban green space (parks, tree canopy, and urban gardens) been conceptualized by US municipalities through the use of a formal sustainability plan? The authors selected 20 US cities as case studies to investigate this question.

In Chapter 13, Gabriel takes a more theoretical approach to determining the ways in which “urban-environmental citizens” are constructed, in varying ways, in the very act of volunteering to restore or maintain what they consider to be “natural” areas of the city. Focusing on the renewed interest in such natural restoration in these times of the more sustainable, post-industrial city in the United States, he explores environmental “volunteerism in ecological restoration as a governmental technology in which volunteers do more than simply carry forward the dictates of the state. Rather, they play a key role not only in self-discipline, but also in shaping the knowledge that informs it.” To substantiate this claim, Gabriel draws on focus groups, interviews, and discourse analysis conducted among environmental volunteers in a “natural” park system in Philadelphia.

Archer and Bezdecny continue this conversation about the “restoration” of urban “nature” in Chapter 14 with a case study of Seattle’s only river, the Duwamish. With an initial discussion concerning how urban nature is really “socio-nature,” as pointed out by several other authors in this collection, they then present a brief history of what they call the comprehensive modernist “terraforming” of Seattle that very much belies the contemporary view of the city as thoroughly “green,” sustainable, or otherwise compatibly nestled in its “natural” setting. The main plotline in their account, however, is the ongoing attempt to somehow “restore” the Duwamish River, much of which has been channelized and polluted

for over a century and continues to serve as Seattle's main industrial docklands. The authors emphasize the difficulty of such an endeavor with a specific focus on how such a "restoration" process is multipally interpreted by industrial, environmental, and citizens groups and what this means in terms of eventually determining the success, or not, of the whole multimillion-dollar "environmental restoration" project.

Part V, "Other experiences of the city environment," addresses the many ways that cities can be conceptualized as social-natural hybrids and what this implies about the overall relationship between cities and the environment. This includes an experiential relationship with the urban environment that is comprised of an agent-based, aesthetic approach to interacting with city-spaces in order to redefine/re-envision those spaces by using all of our senses instead of merely our vision. A second, alternative relationship with the urban environment is one of biotechnology, as suggested in the second piece in this part, creating ultra-human urban spaces, further blurring the line between the city and "wild" spaces as they become more-than-human whilst simultaneously not-quite-human spaces.

In Chapter 15, for example, Kitson and Bratt argue that it is often not recognized that "(t)ouch, taste, texture, temperature, sound, smell, sight and other sensory modalities" actually "define the experience of urban life" as "brain-body-environment are inextricably linked." They suggest then that it is "precisely the realm of urban design and practice, however, that such sensory knowledge is needed" because such knowledge, of course, includes notions of the ecological well-being (or not) of the city and its residents. Under the banner of what they call "sensual urbanism," Kitson and Bratt consider how one understands the urban environs and how one interacts with these environs sensually particularly because, in their opinion, "(a)esthetic considerations of comfort, beauty, pleasure, and happiness are critical to environmental solutions" in today's cities.

In Chapter 16, Jones adopts a similarly unique, very personal approach to the issue of cities and the environment by interrogating the notion and value of urban "forests" by paying very close attention to how they are identified and, more or less, come to be designated as such through human discourse and practice. Taking the urban "forest" of Moorhen Flats Reserve in Brisbane, Australia as his case study, Jones follows the human practical and discursive threads that have come together to designate Moorhen as a living arrangement, or assemblage, dubbed an "urban forest" smack dab in the middle of a large, very busy metropolitan area. This, he argues, allows him to render more visible the "specific dynamics and idiosyncratic qualities" involved in the making of this particular wooded area in Brisbane that, heretofore, were "rendered less visible by

the urban forest's municipal-wide measurements of tree canopy cover and financial assessments of ecosystem services."

Finally, Part VI, "The prospect for cities and the environment," explores the future of cities in a world where global environmental crises are, and will continue to grow as the primary result of the activities of ever increasing numbers of city-people. Whether it is addressing the challenges of global climate change, or striving to deconstruct the greenwashing allowed by the current usage of the notion of "sustainability," the real future of humanity's relationship with the non-human environment will be found in the planet's ever-growing cities.

In Chapter 17, for example, Davidson and Gleeson repeat a charge made in several other chapters in this collection that, despite all the talk of greening and sustainability with regard to cities in the twenty-first century, environmental degradation is really only getting worse. The authors also adopt an urban political ecology theoretical framework by which, they argue, they can better understand how uneven power relations in the city lead directly to unevenly equitable socio-natural environments, both locally and globally. In contrast to the growing and glowing city literature that champions the supposedly equally greening and growth economies of major cities worldwide – what Davidson and Gleeson call the "new urbanology" literature – the authors focus on the limits to so-called green technological/economic fixes in city world of severely uneven power relations and ultimate ecological limits.

Finally, in Chapter 18, Luke continues the critique of greenwashing notions of "sustainability" by juxtaposing them with earlier, more radical versions of sustainability that actually stood up to and seriously questioned the severely uneven political and economic status quo that was driving cities and, indeed, the world to ecological disaster (and still is). Closing in on the theme of this book, Luke argues that this "balance between subversion and subservience in ecology (and environmental studies) perhaps is most manifest in questions regarding sustainability and the city." Throughout the chapter, he critically interrogates this balance by comparing and contrasting two different paradigmatic conceptions of the present, now global situation: what he calls a radical "new environmental paradigm" to take the place of the current, sham, greenwashing "sustainability" discourse and practice and what he calls the "dominant social paradigm," which includes not only this greenwashing but also the notions that growth is best and even better in the currently hegemonic neoliberalizing capitalist fashion. In short, Luke seeks to remind us of the actual radical roots of environmental discourse and practice that have all but been forgotten in recent times as a result of the cooptation of "environmentalism" by the dominant social paradigm.

In the end, we as editors hope that by presenting different theoretical and empirical perspectives on the past, present, and possible future of the relationship between cities and the environment we can help continue the critical discussion as to whether this urban future can be made both more ecologically sustainable and more socially just with all the implications this would have for the future of the increasing number of cities and city-people across the globe in general.

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