

Chapter 1

Botanical Garden Histories of Governance

1.1 Opening Vignette: Writing *Postnormal Conservation*

[G]enerative, effective multispecies environmental justice must be as much about play, storytelling and joy as about critique and pain. Storytelling is a thinking practice, not an embellishment to thinking.

—Donna Haraway, *Staying with the Trouble: Making Kin in the Chthulucene*

Steeped in rich histories of scientific discovery, colonial empire building, and modern nation-state governance, the Royal Botanic Gardens, Kew, explored in chapter 2, is now a UNESCO World Heritage Site. From 2013 to 2018, Kew took on the restoration of one of its main exhibition buildings: a world-renowned Victorian glasshouse (Payne 2018). It was designed in the mid-1800s to host and exhibit plants from faraway lands located within our planet’s temperate zones. Inaugurated in 1863, for almost two centuries Kew’s Temperate House displayed “exotic” plants while instructing audiences on the scientific merits and economic potential of plant “otherness.” In 2013 the Heritage Lottery Fund, the organization that funded the greenhouse’s restoration, mandated the botanic garden to envision the space’s mission anew as a site of multicultural-multispecies conviviality. Kew interpreted this context as providing rich opportunities for increased focus on the production of “nature” in the form of rare and endangered plants, to teach general publics about the plight of threatened plant species, as well as to communicate the importance of related scientific knowledge production and biodiversity conservation. In the meantime, a social anthropologist embarked on a research trip to discover how staff in different administrative units of the garden have

understood and implemented this new mandate. At the time of the refurbished greenhouse's launch in the Spring of 2018, the big questions were: What will the grand reopening unveil? How will it fit vis-à-vis the historical-colonial legacy of this multacentennial institution, and Kew's more recent revamping as a contemporary center of calculation? Now that Kew's Temperate House is finally open to the public the bigger question is: what does it signal about the politics of postnormal science and human-plant assemblages in the age of environmental concern?

Conceptualized in the 1930s as a New Deal socioeconomic development project to boost a city that was hit particularly hard by the 1929 stock market crash, at the dawn of the twenty-first century a botanic garden grows into a multi-institutional space for life—literally, not just metaphorically. Meet Montreal's Espace Pour La Vie/Space for Life in chapter 3 for a fascinating story of multispecies engagement in contemporary biodiversity conservation. As a social anthropologist navigates through its complex institutional arrangement, she discovers a world of biodiversity conservation that is made of monarch butterflies, flowers, forests, transcontinental migration habitat corridors, university-trained scientists, citizen scientists, milkweed, private urban gardens, and international collaborative networks. Will the conservation biologists and public engagement staff who work in this living space help her make sense of such wide and complex assemblages? And what will their conversations divulge about the performance and production of biodiversity conservation natures in the Anthropocene?

One is a multacentennial Scottish botanic garden famous for its role in supporting adventurous nineteenth-century discovery of botanical riches in the Global South; for its leadership in scientific plant research; and for its role as an international hub for training botanical garden scientists and managers. It is the prestigious Royal Botanical Gardens Edinburgh, located in the city from which it got its name. The other—a much beloved Victorian Zoo—is Bristol Zoo Gardens—formerly known for its popular elephant rides, its entertaining monkey temple, and its stunning flower beds. Now middle-level management staff working at these two unlikely bedfellow-institutions share a vision: to engage regular citizens in the joint pursuit of urban biodiversity and increased socio-ecological well-being. Learn about these projects in chapter 4, as it engages with thought provoking questions: What do the projects indicate when carefully managed divisions between scientific experts and lay audiences, as well as between humans, plants, and animals, characterized these

institutions' *modus operandi* for centuries? What do these projects say about the living natures that the Anthropocene brings forth, and about the strategic deployment of discursive opportunities to reorder relations between humans and nonhumans?

This book has much to do with story-telling—past and present. It is about the stories that botanic gardens tell themselves and their publics in regard to their devotion to the scientific study of plants, the dissemination of scientific knowledge, and public engagement. It is about stories botanic gardens have told and tell their nations to justify their relevance at different points in time. And it is about the ways in which some stories are brought to center stage, while others are rendered less visible—or even erased. But, first and foremost, the book is primarily about the stories that variously situated staff working within these institutions tell in pursuit of variously conceptualized visions of what constitute pertinent objects of scientific engagement, of what “biodiversity” is, how it ought to be “preserved,” and of how general audiences can best be engaged in pursuit of these visions.

Of the vast range of stories that botanic gardens offer, few are likely to be as significant for social scientific research as their involvement over time with leading conceptualizations, representations, and productions of “nature,” with knowledge development and dissemination, and with practices of human-plant management. While scholars have studied these dynamics in relation to these institutions' pasts, *Postnormal Conservation* explores them in the context of the current rebranding of botanic gardens as biodiversity champions. Moreover, the book points to the struggles that stem from the articulation of variously situated understandings and practices within contested spaces of botanical garden governance.

Although in some sense this book is a series of *petits récits* comprised of localized botanic garden-specific narratives (Lyotard 1997/1979), the present chapter contextualizes the embeddedness of these localized stories within much wider and globally reaching patterns of governance. The chapter demonstrates that rather than constituting a recent development associated with biodiversity conservation, the entanglement of botanic gardens with governance spans centuries. Botanic gardens participated in the development of new systems for ordering and classifying the world that facilitated the establishment of the modern nation-state and respective governance practices. Botanic gardens were also involved in the consolidation of what Bauman calls the modern “gardening state,” by helping to render plants, as well as humans, governable objects “of

administration [. . .] problems to be solved [. . .] ‘controlled,’ ‘mastered’ and ‘improved’ or ‘remade’” (Bauman 2001, 18).

In order to support these lines of argumentation, the present chapter fulfills two mandates: first, it presents a generic synopsis of the institutional history of botanic gardens from the point of view of their embroilment with governance since their inception; second, it brings forth a theoretical framework to account for the historical intersection of botanic gardens with governance processes associated with the rise of modernity, the consolidation of the nation-state, and colonial empire-building. The chapter also relies on Michel Foucault’s theorization of modern governance as a theoretical framework that facilitates the analysis of botanical garden histories in relation to modern state governance at various historical junctures.

This sets the analytical ground for subsequent chapters in the book that explore and theorize the Anthropocene as a productive, albeit contested, discursive space whereby a variety of socioculturally and political situated actors within botanic gardens engage with “biodiversity” and with “conservation.” These garden-focused chapters provide a kaleidoscopic glimpse into the multifariousness of the Anthropocene as a discursive phenomenon that couches crucial aspects of contemporary biopolitics (cf. Castree 2008, 2014; Luke 2000). Following in the footsteps of important contributions to the theorization of the Anthropocene by posthumanist scholars (e.g., Haraway 2018; Lorimer 2015; Tsing 2015), these later chapters seek to further question, and add, sociocultural, material, and political dimensions to the investigation of the Anthropocene as a geo-ecological and historical phenomenon (see Tsing et al. 2017 for reviews and problematization of the “Anthropocene”).

1.2 Botanic Gardens, Modernity, and Governance

1.2.1 *Godly Orders and Earthly Challenges: The Rise of the Botanical Garden Institution*

Botanic Gardens Conservation International (BGCI) summarily defines Botanic Gardens as “institutions holding documented collections of living plants for the purposes of scientific research, conservation, display and education.”¹ A broader, though not exhaustive, list of criteria includes the following items that botanic gardens must meet “in part or in whole” as a condition to acquire and maintain their status as such:

[to conduct] research programs in plant taxonomy in associated herbaria; [to arrange for the] exchange of seed or other materials with other botanic gardens, arboreta or research institutions; [to be] open to the public; [to have an] underlying scientific basis for the collections; and [to engage in] communication of information to other gardens, institutions and the public.²

The botanical garden is an extremely adaptable and resilient institution. Botanic gardens have been able to make themselves relevant to state governance in a variety of historical contexts for almost five hundred years now. Botanic gardens are, quintessentially, institutions of modernity. Their rise and proliferation is associated with the establishment of science, the secularization of knowledge, the emergence of the nation-state, and colonial processes of empire building that operated as antecedents to the development of capitalism. Some have argued that the first botanic gardens were monastic gardens that embraced a dual theological quest: to understand the ordering of plants within “creation,” and to discover god’s given curative properties of plants (Hill 1915; Prest 1981). Others locate the origin of the modern botanical garden institution more squarely as a scientific response to the arrival of modern Europeans to the American continent, and the respective discovery of an entirely new plant kingdom that was yet to be placed within established European orders of life (Oldfield 2009; Blackmore & Oldfield 2017).³

Although theological and scientific pursuits are often seen as irreconcilable in a post-Darwinian world, Gaukroger (2006) has demonstrated that the dynamic relationships that took place between theology and science during the sixteenth century were actually vital to the establishment of modernity. So too was the institutionalization of scientific ordering systems which, we shall see, were integral to the emergence of modern political governance (Bauman 1991; Drayton 2000; O’Malley 1996; Turnhout 2016). Seemingly in agreement with these views, Don Rakow & Sharon Lee (2015) have cogently argued that theology and science remained intertwined for a considerable time at botanic gardens after their initial foundation in mid-sixteenth century. Nevertheless, it is also possible to identify tension between theological and scientific orientations within early botanical garden frameworks. Be this as it may, by the nineteenth century the two views were irreconcilably divorced, and there have been little to no traces of theology within the botanical garden institution ever since.

Building on these propositions, I contend that botanic gardens are as much the product of modernity as they are enablers of modernity. My

approach stems from a sociological conceptualization of modernity that notes three related focal areas of historical transformation (cf. Giddens 1988). These are listed as follows:

- first, the emergence of a web of new ideas and attitudes about the nature of the world's existence (i.e., ontology), about its knowability (i.e., epistemology), and about its governability (associated politics of governance);
- second, the establishment of new political entities such as the nation-state, its systems of governance, and resulting interstate relations; and
- third, the shift to increasingly dominant forms of market economy.

This chapter focuses on the first two dimensions of botanical garden contributions to the genesis of modernity, whereas the third dimension listed above is explored in greater detail in chapter 2 through an analysis of Kew's role as a center of calculation within the British Empire. The first order of business then, is to investigate the suggested embroilment of theological and scientific concern at botanic gardens as the expression of new ideas about the world and attitudes in relation to governance. This will reveal the pronouncement of profound transformations in European ideas about "nature" and "society" (ontology), knowledge (epistemology), and governance that accompany the onset of modernity. These transformations stand in contrast to the onto-epistemological governmental paradigm shift that began to coalesce in mid-twentieth century around issues of biodiversity conservation, investigated later in this book.

The first botanic gardens appeared in Italy in mid-sixteenth century (Pisa 1543, Padua 1545, Florence 1545, and Bologne 1547).⁴ They developed from the monastic enclosed garden known as *hortus conclusus* (Rakow & Lee 2015, 269). Technically, these early botanic gardens fell under the category of physic gardens (*hortus medicus* or *herbularis*), where medicinal plants and herbs were grown (Hill 1915; Johnson 2011a; Oldfield 2009; Prest 1981; Sonderstrom 2001). According to Drayton, these early gardens were designed to capture "the many faces of God in Creation" and to reconstitute the Garden of Creation, which "Man's" fall from grace had scattered (Drayton 2000, 4).⁵ The European discovery of the Americas and Australia, and the concomitant arrival in Europe of

an entire world of previously unknown living creatures, exacerbated the urgency of this quest. It was coupled with a new scientific conundrum. From a theological point of view, the “discoveries” challenged orthodox interpretations of the Bible and of the Catholic Church’s authority to represent the world’s God-given order (Prest 1981, 38). From a scientific perspective the challenge was to rethink the wisdom of the Aristotelian, Theophrastian, Dioscoredian systems of plant classification that had been integrated into medieval European plant *doxa* (Bourdieu 1977).

With the rising predominance of universities in latter sixteenth century and throughout the seventeenth century, many botanic gardens were absorbed into the university system. For example, The Jardin des Plantes (France), founded in 1593 (Rioux 1994), “served as a teaching laboratory for the medical and pharmaceutical students of the University of Montpellier” (Rakow & Lee 2015, 280). In the meantime, Clusius had created the first botanic garden proper,⁶ in 1590, in Leiden (Netherlands). In addition to the study of medicinal plants, this true *hortus botanicus* (Rakow & Lee 2015, 270) was dedicated to the study of the “new” and “exotic” plants that were brought to Europe via the Middle East and Turkey, as well as via European expansion into the American and Australian continents. The *Alter Botanischer Garten Tübingen* was founded in 1535; its *Hortus Medicus* was built in 1663. And, the University of Copenhagen’s Botanical Garden was founded in 1600 for similar purposes.

The study of the medicinal and pharmaceutical properties of plants remained the main common denominator in the creation of the majority of early university botanic gardens (Rakow & Lee 2015). Despite Clusius’s innovations, it took time for the study of plants in and of itself to beat the primacy of an instrumental interest in plants that was centered on their medicinal applications (Drayton 2000; Rakow & Lee 2015). This primacy is clear in the words of Oxford University’s vice-chancellor at the moment when University of Oxford Botanic Garden’s foundational stone was put down in 1621. He stated that: “money could not be better laid out than to begin and finish a place whereby learning, especially the Faculty of Medicine, might be improved” (Hill 1915, 198). Even Cambridge University, which came to flourish as one of the most important botanic university research gardens in the UK, was originally founded in 1588 to serve primarily the necessities of teaching medical students (Parker 2006). It was not until after botany *res herbaria*—had become a wholly accredited science under the efforts of botanists like Linnaeus, in Leiden, in the late 1700s, that the Cambridge University

Botanic Garden became a full-fledged botanical research institution by 1825 (Parker 2006, 5).

Theological considerations are said to have remained quite central within this context (Drayton 2000; Prest 1981). For example, at the time of its establishment, in 1621, the University of Oxford Botanic Garden was meant to pursue the joint mission of promoting “learning and the glory of god.”⁷ As surprising as this coexistence of theological and scientific goals may seem to twenty-first century readers, it was quite common at the time. Early botanists coalesced around “the [shared] relationship of their studies to the Protestant Reformation that was sweeping across Europe” (Rakow & Lee 2015, 276). Rakow and Lee contend that those engaged in the creation of botanic gardens “did so both as devotional acts and as ways of advancing their science” (Rakow & Lee 2015, 277). As the authors put it, these botanists shared “a passion for questioning and exploration” and a desire to reexamine “long-held religious assumptions and political assumptions” (Rakow & Lee 2015, 277).

This contention follows in step with Graukroger’s theorization of characteristic dynamics between theology and science in early modernity. His work demonstrates that although relations between religion and natural philosophy changed quite radically during this period, this shift was far from straightforward and certainly not linear (Gaukroger 2006, 22). In fact, he insists that “the outcome is by no means a turn away from religion, but rather in many aspects a turn towards it” (Gaukroger 2006, 22). Given the relevance of this argument for the context of botanic gardens it is worth quoting Gaukroger at some length.

[. . .] A good part of the distinctive success at the level of legitimation and consolidation of the scientific enterprise in the early-modern West derives not from any separation of religion and natural philosophy, but rather from the fact that natural philosophy could be accommodated to projects of natural theology [. . .]. Far from science breaking free of religion in the early-modern era, its consolidation depended crucially on religion being in the driving seat: Christianity took over natural philosophy in the seventeenth century, setting its agenda and projecting it forward in a way quite different from that of any other scientific culture, and in the end establishing it as something in part constructed in the image of religion. (Gaukroger, 23)

Drayton's (2000) work brings this line of reasoning back into the context of botanic gardens. His analysis captures the inextricability of science, religious thinking, and new ideas about governance. He contends that "as [the botanic garden] ministered to the needs of the body and soul, [it] acquired a political significance" (Drayton 2000, 26). Drayton places the science that developed at botanic gardens at the heart of political transformations in governance that are associated with the rise of the nation-state: "Beyond [the realm of practical impacts], the sciences, with their promise of insight into, and control over, nature, lent potent ideological help [to newly emerging governmental rationales]. [. . .]" (Drayton 2000, xv). This extended the governing effect of botanic garden conduct beyond the realm of plant-worlds to include human societies such that, according to Drayton, nature became "the theatre in which power might prove its virtue." The future of botanic gardens hence came to "depend on this faith that kings and empires might purchase their right to rule with plants and gardens" (Drayton 2000, 44).

Drayton provides an overview of Western sacred and secular literatures that covers centuries, so I cannot do full justice to it in the small scope of this section. His core argument, however, is that this literature presents the study of plants, on the one hand, as divinely sanctioned and, on the other hand, as "a token of wise government" (Drayton 2000, 27). On a religious plane, Drayton discusses Walter Raleigh's influential views on the intersection of scientific knowledge and governance. He explains that Raleigh "believed that Noah left to his son the knowledge of [Nature—including plants]" and that "because all earthly power derived from the prerogatives passed through Adam, Noah, David and Solomon, the monarch or gentleman with scientific interests was engaged in the reconciliation of natural and social providence" (Drayton 2000, 31).

Drayton shows, moreover, that in addition to a genealogy of ideas in the West that can be traced back hundreds—if not thousands—of years, these precepts inform Bacon's contention that "a recreated Eden was an essential resource for the Prince" (Drayton 2000, 30); especially, insofar as Bacon proposed that "the rational study of nature led directly to miraculous political gifts" (Drayton 2000, 30). We will soon see that O'Malley (1996) has analyzed these processes at work within eighteenth-century nation-state building endeavors in the United States, whereby in ministering "to the needs of the body and soul, [the botanic garden] acquired a political significance" in the consolidation of the United States as a nation-state.

Notwithstanding the historical embroilment of theology and science at botanic gardens, the two became increasingly decoupled throughout the eighteenth and nineteenth centuries. This decoupling expressed the consolidation of scientific knowledge as increasingly dominant epistemology. It was associated with humanity's emancipation from god and growing faith in the human ability to know, understand, and govern the world. The development of new taxonomic systems, such as Linnaeus's system of plant classification in the late 1700s, was integral to this process. They enunciate a cut from the Catholic Church's authority over theologically based views of nature as the reflection of godly orders of being. These new systems of classification showed the ontology of living creatures as entities that humans could organize logically and systematically into discrete categories.

This transition from theological to scientific onto-epistemology is observable at botanic gardens with the creation of the first systematics gardens. At Leiden, where Linnaeus held "tenure" from 1735 onward, the first systematic gardens presented nature as an ordered sequence of plants organized in terms of observable family relations. Their goal was to represent and "classify all the new glories of the plant world which were being brought back by explorers and botanists" (Soderstrom 2001, 31). Within the discursive bounds of science these systems of classification were ideologically presented as neutral reflections of the natural world; and as the product of newly developed methods to separate the production of knowledge from subjective, social, religious, and political interest.

As the field of social studies of science has shown time and time again, however, classification systems—including Linnaeus's system of plant classification—are inherently political (Schiebinger 1993). They affect and promote the creation of hierarchical systems of classification that renders "nature" governable, and divides humans into politicized categories such as gender and "race" (Bauman 1991; Foucault 2002/1969 Johnson 2011a; Schiebinger 2004). Turnhout explains that "[c]lassification systems are essential in all scientific activities because they tell scientists what to look for, what items to group in the same category, and what items belong in a different category" (Turnhout 2016, 5). But she also adds that "such significance is not inherent, it is attributed. [. . .] Once in place [classification systems] fundamentally structure what is observed and how, and they can become difficult to change" (Turnhout 2016, 6).

These transformations are at the core of the emergence of Modernity. They were also integral, as well shall see in further detail, to the rise of

the nation-state and associated politics of governance and domination. Bauman sheds light on this contention when he explains that,

Modernity was born under the sign of such order—order seen as a task, as a matter of rational design, close monitoring and above all persnickety management. Modernity was bent on making the world manageable and on its daily management; the zeal to manage was whipped up by the not altogether groundless conviction that when left to themselves things will go bust or run amuck. Modernity set about eliminating the accidental and the contingent. If the notorious “project of modernity” can be adumbrated at all, it can be only envisaged as a retrospective gloss on the firm intention to insert determination in the place where accidents and games of chance would otherwise rule; to make the ambiguous *eindeutig*, the opaque transparent, the spontaneous calculable and the uncertain predictable, to inject purpose in things and then make them to strive for the attainment of that purpose. (Bauman 2005, 125)

The development of systematics gardens within botanic gardens is, therefore, part and parcel of wider transformations in the conceptualization of the world as amenable to prediction, calculation, and governance in view of well defined purposes. Moreover, seen from this perspective, systematics gardens were crucial to the participation of the botanical garden institution within European nationalist colonial projects.

I agree fully with Sonderstrom (2001) that eighteenth- and nineteenth-century botanic gardens can be seen as forming a class of their own. Colonial botanic gardens were botanic gardens of Empire in that they provided the added service of researching the potential economic applications of plants, as well as techniques to acclimatize them across different geographic regions or continents (Brockway 1979a, 1979b; Desmond 2007; McCracken 2000; Paterson 2008). Kew, initially founded by royal decree as a Royal Botanic Garden, is the prime example of a botanic garden that transitioned into the category of a colonial botanic garden (and later, as shown in chapter 2, into an imperial garden).

It is critical to remember, that European colonial botanic gardens relied on a vast network of tropical botanic gardens that were constructed in the Global South to serve the colonial nation—thus extending the

scope of modern nation-state governance globally. These were, more often than not, acclimatization stations rather than full-fledged research and teaching stations (Rakow & Lee 2015). They did not possess the same knowledge production resources with which botanic gardens in colonial metropolises were endowed. Much like the relations between “metropolis” and “periphery” that generally characterize power dynamics between colonizing power and colony, many botanic gardens in the Global South were founded during this time within the logic of extractive relations with the Global North.

Arguably, the history of these relationships is neither monolithic nor static. Histories of resistance and opposition with this context are indeed vast. Many of what one might now call postcolonial botanical gardens share histories of anticolonial politics. I suggest that the Jardim Botânico do Rio de Janeiro offers an illustration of these dynamics. It was first instituted as a colonial botanical garden by the Portuguese, in 1808, when Brazil was still a colony (Gaspar & Barata 2008). Its purpose was to acclimatize plants so that they could be imported from other colonies (especially from the West Indies) and moved across the Portuguese empire for economic benefit. It was also meant to serve as a research center to identify the economic potential of tropical plants within the Portuguese empire. However, the Napoleonic Wars in Europe changed the status of Rio’s botanic garden when Napoleon invaded Portugal and, as a consequence, the Portuguese royal family moved to Brazil in 1808. This move initiated a chain of events that eventually lead to the cessation of the King’s rule over Portugal.

Brazil became an independent nation free from its colonial ties to Portugal in 1825. Gaspar and Barata (2008) show that gardens soon became a crucial element in the process of Brazilian nation-building. Specifically, the Jardim Botânico do Rio de Janeiro anchored the study, acclimatization, and propagation of plants at a national level, which were part of the new government’s project to build Brazil as an economically independent and viable nation (Gaspar & Barata 2008). When the garden opened its gates to the public in 1819⁸ it made Brazilian plant knowledge and education accessible to the masses, especially concerning the dissemination of information about endemic species. Nature was, in this context, produced as a nation-building resource and performed as a symbol of nationhood.

Other botanic gardens in former colonies were instituted within postindependence frameworks with the goal of bringing the glory of

European metropolises to former colonies. I perceive such attempts as entailing a cosmopolitan agenda that aimed to achieve a universalistic humanist project. The history behind the foundation of the Missouri Botanical Gardens in 1859 supports this contention. It is a captivating story of philanthropy by an English immigrant—Henry Shaw—who fulfilled the American Dream (Luke 2000). The story tells that Shaw amassed a fortune, went on a European Grand Tour, which included an excursion of the best gardens in England and in the Continent. It tells that upon his return Shaw decided to donate his estate toward building the garden. However, Shaw also wished to assure that the standard of his legacy lived up to the best botanic gardens in Europe. To these ends Shaw reportedly sought “the guidance of Sir William Jackson Hooker, director of the preeminent Royal Botanical Gardens at Kew, in developing a plan for his botanical garden” (Styles 2012, 9). Staying within the dictums of a true cosmopolitan dream, Shaw wanted his garden to become “a source of learning, refinement, and inspiration for all St. Louisians” (Styles 2012, 42). Clearly, the stories that inform the politics of botanical garden institutionalization in former European colonies are far from reflecting linear hierarchical relations between “cosmopolitan centers” and “peripheries.”

During the twentieth century many postcolonial gardens were inaugurated around the world as former colonies became independent nation-states. Nevertheless, the most significant innovation of the twentieth century on the botanical garden front was the proliferation of specialized botanic gardens all over the world, many of which dedicated to environmental and/or social causes. For instance, the Jardin Botanique de Montreal (now part of the multi-institutional Espace Pour La Vie that chapter 3 investigates), was developed as a 1930s New Deal project to create jobs and stimulate the economy in an industrial area that had been badly hit by the economic downturn of the big recession (Armstrong 1997). It was envisioned, as most botanic gardens are, as a place for botanical research and scientific investigation. But it was also intended to offer jobs, leisure, and sources of well-being for local residents in the aftermath of extreme psychological distress that resulted from the 1929 recession. Montreal’s botanical garden was in this way one of the pioneers⁹ in the movement at botanic gardens (Neves 2017) to take on social responsibility mandates in the widest sense of the word (see also Soderstrom 2008).

Other forms of specialization for the new botanic gardens that have proliferated since mid-twentieth century include ethno-botanical

gardens, which focus specifically on relations between people, their cultures, and plant biodiversity. An example of such a garden is the Amy B. H. Greenwell Ethnobotanical Garden on the Island of Hawaii,¹⁰ which focuses on teaching people about local traditions and culture, or the Jardin Botanic de Puebla in Mexico,¹¹ which focuses on teaching people how to use plants in daily life for health, culinary, aesthetic, and biodiversity purposes, among others.

1.2.2 *The Gardening State*

The etiological myth deeply entrenched in the self-consciousness of our Western society is the morally elevating story of humanity emerging from pre-social barbarity. [In this context] stands fast the modern “gardening state,” viewing the society it rules as an object of designing, cultivating and weed-poisoning.

—Bauman, *Modernity and the Holocaust*

Bauman’s (2001) concept of the gardening state captures the profound historical transformations that the conduct of governance undergoes with the rise of modernity. His approach is nested within a sociological tradition that investigates modernity as its main object of inquiry.¹² From this point of view, Bauman theorizes the inextricability of modern ontological postulates, epistemological assumptions, and the legitimation/practice of governance. At a generalist level of argumentation, Bauman contends that the transformations that characterize modernity revolve around a new understanding of: “society [and ‘nature’] as an object of administration, as a collection of so many ‘problems’ to be solved, as ‘nature’ to be ‘controlled,’ ‘mastered’ and ‘improved’ or ‘remade,’ as a legitimate target of ‘social engineering,’ and in general a garden to be designed and kept in the planned shape by force [. . .]” (Bauman 2001, 18).

From Bauman’s perspective, the conduct of governance by the modern nation-state is akin to that of a gardener managing a garden (Bauman 1989, 1991). Bauman explains that its main goal was to eliminate the chaos, openness, and contingency that modern life created, and to substitute these perceived threats with solid human-made systems of ordering and governing. Bauman’s argument builds on the problematization of what he describes as modernity’s difficulties with “ambivalence.”

By this he means modernity's difficulties with that which is different from the norm, which escapes established reigning orders, and/or which does not quite fit the dominant status quo.

Bauman argues that modernity's universalizing projects inherently bring forth ambiguity. As a result of this paradox, modernity's core task becomes the quest to seek and impose order (Bauman 1991). He contends that the pursuit of order was so quintessentially integral to modernity that it became "the archetype of all other [modern] tasks" (Bauman 1991, 4). As a result, the desire to reorganize society and nature in accordance to the principles of reason and rationality became the modern state's *causa finalis*.

Modernity's ordering dictum entailed the creation of vast bureaucratic apparatuses that were meant to govern life¹³ within state boundaries—and, one can add, within the scope of imperial colonial holdings. The system was steered by new knowledge/power elites who claimed expertise over the scientific knowledge and rational methods which, they contended, were necessary to create optimal conditions for desired life forms to grow and develop. According to Bauman, this applied to humans as well as to nonhumans. On the one hand, modern governance "weeds out" those whose existence threatens optimal outcomes for variously imagined nation-state projects. On the other hand, "the gardening posture divides vegetation into 'cultured plants' to be taken care of, and weeds to be exterminated" (Bauman 1989, 18). Bauman illustrates the dangers that the logic and *modus operandi* of the gardening state carry through the horrific atrocities of Nazi Germany and its perpetration of the Holocaust (Bauman 1989, 1991). This abhorrent logical reasoning is well captured in Davis's words when he explains that from this standpoint, "in order to create the 'gardener' must first destroy. The 'weeds' were seen as the enemy population within, often not-fully-assimilated 'strangers' in the nation-state, who were targeted either for expulsion, or extermination" (Davis 2008, 25).

For the most part, Bauman's concept of the gardening state has been taken and used as a metaphor.¹⁴ When applied to the investigation of botanic gardens,¹⁵ however, the gardening/governance metaphor acquires literal potency (see Ginn 2017, for a similar argument in the theorization of urban gardening). To be sure, botanic gardens were instrumental in the optimization of plant growth and management methods that facilitated the administration of the vegetative life worlds that supported national populations and economies; often across vast spans of imperial holdings

(see chapter 2 for a detailed account). These developments took place in tandem with—and were in fact entangled with—the establishment of rationality as the foundation of European modern governance.

It is in this sense that I argue that botanic gardens are simultaneously agents and products of modernity, as well as of the nation-state. Borrowing Drayton's words, they are spaces "of modern history, in which ideas about nature, economy, and legitimate authority interacted with concrete policies [. . .]." (Drayton 2000, xvii). The notion that "nature" exists independently from humans as a separate entity, that it exists for human benefit, at disposal of human control, and the notion that humans can and ought to govern nature, are quintessentially modern ideas. They are the product of the intellectual labor of a long succession of thinkers as well as of the transformation of former theologically rooted views of the world and concomitant practices.

It is crucial to note that the emergence of characteristically modern ideas about the world's garden-like qualities, about its openness to human understanding and mastery, and about the power and legitimacy to govern was historically entangled with the development of botany as a science and with the related proliferation of botanic gardens (see also Drayton 2000, 30–32). Chapter 2 will further demonstrate that botanic gardens like Kew, among others, also played important roles in rendering plants commensurable across socio-ecological and economic contexts which, in turn, is also part and parcel of the establishment of the modern nation-state's systems of governance. This included the standardization and systemization of plant knowledge, and the subsequent remobilization of these resources at a vast array of socioeconomic and ecological junctures (Miller 1996a, 6; Miller 1996b). From this point of view, the importance of botanic gardens within the context of the gardening state is fairly conspicuous.

Perhaps less evident is the role that botanic gardens played in relation to the gardening state's "cultivation" of human beings. And yet, despite its lesser visibility, this task was crucial to the consolidation of the modern nation-state. It amounted to, as Dobson explains, the use of "education, culture, and science to nurture and shape the minds and bodies of citizens," while also destroying "anything that might damage the nursery" (Dobson 2009, 34). To be sure, the modern state exercised power in "both pastoral and proselytizing" form (Hetherington 1997). In this context,

Education, not least educating the state, became the ambition of the intellectuals and legislators. These educative and gardening ambitions of the modern state and the crusade against ambivalence found their expression in the Enlightenment thinking of the intellectuals in their desires for reason and order. Such ideas were translated into social practices of social ordering and classifying all that which came to represent the ambivalence of a changing society. (Hetherington 1997, 59)

As a way of illustrating these arguments, it is worth noting that the nation-building premises that informed the institutionalization of the first American botanic gardens encompassed the political mandate of exerting “a profoundly moral influence upon citizens.” This included engaging illiterate citizens who, it was expected, “would be capable of instruction through the direct observation of plants” (O’Malley 1996, 215). Citing a representative argument for the creation of Washington Mall’s botanic garden, O’Malley relays the following words: “Gardens and nurseries [. . .] it is hoped now become of peculiar interests to the patriot and legislator . . . For objects of this nature there is certainly no place better adapted than the seat of the general government” (O’Malley 1996, 216).

The involvement of American botanic gardens with the establishment of the modern gardening state is by no means unique. Arguably, this relationship appears to characterize a particular historical juncture in the botanical garden institution (though, evidently, how these relationships played out—and/or were resisted—was always contingent on the specificities of individual botanic gardens and the nation-states of which they were part). We will later see that similar logics of instilling greater moralizing educative influence upon citizens can sometimes be seen to reverberate in contemporary botanical garden environmental governance.

1.3 The Reinvention of Botanic Gardens as Agents of Biodiversity Conservation in the Anthropocene

As the twentieth century drew to an end and issues of climate change and biodiversity loss became ever more prominent on a global scale, new botanic gardens were created to focus on environmental sustainability

and biodiversity conservation. Belize's botanical garden is an example of these developments. It was founded in 1997, with the mandate "to protect the floral biodiversity of Belize [as well as] to cultivate, promote, and enable the research of tropical flora and its conservation with an emphasis on our native species and their habitats."¹⁶

At the same time, a growing number of existing botanic gardens have been expanding their mandates to include measures meant to address biodiversity conservation (e.g., Blackmore and Oldfield 2017; Neves 2012 2014, 2017; Wyse Jackson 2017). These range from developing programs that educate visitors on the problems of biodiversity loss, to the development of conservation programs in situ and ex situ (respectively, at ecosystems where biodiversity loss is occurring, and at botanic gardens where endangered species can be safeguarded). At Kew, in addition to these conservation schemes, a project called the Seed Millennium Bank Partnership has been implemented as an ex situ conservation strategy, which aims "to secure the safe storage of seed from 25% of the world's plants"¹⁷ by 2020.

A growing percentage of the more than 3,000 botanic gardens currently in existence are embracing conservationist mandates (Blackmore & Oldfield 2017). This reflects what Wyse Jackson and Sutherland (2017) describe as "a renaissance in botanic gardens worldwide, largely as a result of the developing concern for biodiversity loss and the need for many more institutions to become active in plant resource conservation." It also reflects renewed botanical garden roles in researching and preserving the "conservation of the floras of the regions or countries in which they are situated" (Wyse Jackson & Sutherland 2017, 1). In situ and ex situ conservation are, therefore, key aspects of biodiversity conservation at contemporary botanic gardens, as are also scientific research and knowledge dissemination activities (Heywood 1988; Heywood & Iriondo 2003; Maunder 1994; Wyse Jackson & Sutherland 2017). Notwithstanding the primacy of these commitments to biodiversity conservation, botanic gardens have also been increasingly involved in public education and public engagement (Wyse Jackson & Sutherland 2017, 10), as they work to embrace greater social roles in the pursuit of sustainable economic and ecological futures (Dodd & Jones 2010; Neves 2017).

A definitive characteristic of a growing number of botanic gardens is that they nurture and protect plants hosted in their collections as ex situ conservation (Heywood 2015). This often amounts to plants that were gathered long before their places of origin became "biodiversity hot-spots." Botanic gardens often exchange these plant materials amongst

themselves and with kin institutions. In exchanging plant material with kin institutions, botanic gardens help diminish risks such as accidental destruction, cross-pollination, and pest infestation (Haven et al. 2006). In these ways botanic gardens are well prepared to face one of the GSPC's main objectives: to participate in actual plant conservation.

Ex situ conservation also plays an important role in providing plant material and/or scientific support to in situ—on site—conservation such as in the case of ecosystem restoration, for example (Dosmann 2006; Guerrant et al. 2004; Haven et al. 2006). Some amount to considerably large and important projects (see, e.g., Chen, Cannon & Hu 2009; Oldfield 2009). The reality is that ex situ and in situ conservation are increasingly accepted as complementary forms of biodiversity protection (Braverman 2015; Delmas, Larpin & Haevermans 2011; Maunder 1994; Maunder, Higgens & Culham 2001; Maxted, Ford-Lloyd & Hawkes 1997; Neves 2012).

Botanic gardens are therefore uniquely positioned to spearhead the Global Strategy for Plant Conservation (GSPC) within the broader contexts of the Parties of the Convention on Biodiversity. First, botanic gardens are established institutions that dedicate themselves to the scientific/technical study of plants, while sustaining research programs in plant taxonomy in associated herbaria. Second, botanic gardens pursue the systematic documentation and labeling of both domesticated and wild plant species. These two botanical garden characteristics are perfectly aligned with the first three of the GSPC's five core objects: to ensure the understanding, documentation, and recognition of plant diversity.

To these ends BGCI, member gardens, and botanic gardens in general, have worked to build the world's largest plant network with partners, including: zoos, natural science/history museums, parks, community groups, and NGOs (Neves 2014; Wyse Jackson & Sutherland 2000). They can be said to constitute a transnational cosmopolitan risk community that is dedicated to plant biodiversity. In so doing, BGCI and associated partners have come to conceptualize biodiversity conservation as the joint governance of ecological sustainability and social sustainability (Maunder 1994, 2008; Neves 2012, 2017; Willison 2012). Their policy directives are often adopted in partnership with national and local levels of governance, such as Ministries of Environment and municipalities (Galbraith & McIvor 2006).

This activity reflects a remarkable transformation in the public role of botanic gardens, which were formerly associated with elite scientific knowledge, economic colonial control (Baber 1996, 2001; Didur 2010,

2013; Miller & Reill 1996), and leisure (Benfield 2013). BGCI's vision of joint social and ecological sustainable biodiversity conservation, now being implemented at botanic gardens around the world, is slowly but firmly becoming an important model in the governance of conservation. Last, but not least, botanic gardens have a long history of public engagement and education which renders them well suited to fulfill GSPC's objectives 4 and 5. That is, to promote "education and awareness about plant diversity, its role in sustainable livelihoods and importance to all life on Earth"; and to secure the development of "the capacities and public engagement necessary to implement the Strategy."

Botanic gardens are members of an emerging class of organizations with growing stakes in the global governance of biodiversity conservation. They can be seen to exemplify, in Beck's terms, risk communities that appear, "establish themselves, and become aware of their cosmopolitan composition." They aim to tackle the "dangers of risks [that] can no longer be socially delimited in space or time" (Beck 2014, xiv). In this sense, I also propose that contemporary botanic gardens can be aptly described as "boundary organizations." That is, as organizations that "are able to take on both academic [scientific] as well as policy-related tasks" (Beck et al. 2014, 81).¹⁸ Alas they cannot escape the challenges that come with these mandates, namely that:

Given multiple forms of accountability and participation, they face the challenge of taking into account heterogeneous expectations of their different audiences: They have to reconcile political demands, such as for geopolitical representativeness and public accountability, with the need for expert decision-making and integrity. (Beck et al. 2014, 81)

Seen from this perspective, the articulation and implementation of biodiversity mandates by cosmopolitan risk communities is a complex and intricate matter: it is often ad hoc, contentious, and partisan (Turnhout, Neves & Busier 2014; Turnhout, Neves & Waterton 2013). Although to an extent I do investigate botanic gardens as cosmopolitan boundary organizations, I am adamant in emphasizing the need to scrutinize the politics of this purported "cosmopolitanism," and of these "boundaries." Far from monolithic, the botanical garden "community" is a shifting terrain of negotiation amongst the plethora of actors that exist within—and operate across—these institutions.