Botany of Empire
Plant Worlds and the Scientific Legacies of Colonialism

Banu Subramaniam
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In *Botany of Empire*, Banu Subramaniam traces back the science and practice of botany in order to shed light on, challenge, and overcome the colonial underpinnings of the field. A trained evolutionary biologist and plant scientist, Subramaniam now works as professor of women, gender, and sexuality studies at the University of Massachusetts Amherst. As the back cover blurb of the book announces, *Botany of Empire* aims at contributing to a sensibility of the deep colonial roots of plant science in pursuance of a transformation of those foundations and a creation of a more socially just practice of science. Self-labelled a reckoning and a manifesto, the book expresses profound criticism of academic, institutionalised biology on the one hand, whilst on the other hand sketching possibilities of how to overcome the colonial legacies of the sciences.

To accomplish this undertaking, the author did not only draw on her own expertise as a biologist and scholar in feminist Science and Technology Studies (STS), but also anchored her argument in concepts and methodologies from a remarkably wide range of fields such as Indigenous Studies, Disability Studies, Queer Studies, History, and literature. This review takes an historian's perspective on Subramaniam's work, which contributes to the emancipation of the history of knowledge from a Eurocentric history of science, that heroised white, male scientists and 'western' epistemologies and social orders while overwriting and erasing other forms and structures of knowledge and society.

The book is divided into an unpaginated prologue, an introduction, and five parts, each consisting of two short chapters followed by an interlude. Breaking the norm of academic writing we are all used to, those interludes combine personal observations of ongoing problems within the sciences with fictional imaginations labelled 'Fables for the Mis-Anthropocene'. Though differing in style and content, these parts are interconnected through their shared aim of channelling the ideas and insights of the preceding chapter into a positive and optimistic imagination of the future. The book culminates in a manifesto ('Abolitionist Futures: A Manifesto for Scientists'), laying out the key points of criticism of the sciences, followed by a charting of steps towards a more equitable and inclusive practice of science concluding in a call for their realisation.

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Part One of the book ('Rootings'), takes the author's personal upbringings in India and her education in the United States as a starting point of her exploration of the coloniality of botany, which is also the title of the second chapter ('The Coloniality of Botany: Reckonings with the History of Science'). Approximately twenty years after Londa Schiebinger's foundational works on bioprospecting in a colonial context and her introduction of the notion of colonial botany as an economic enterprise of European Imperialism, Subramaniam uses this first part to assemble key arguments of the feminist critiques of the history and historiography of science. Even though most of the points made in this part of the book are not entirely new, revisiting the lasting effects of colonialism on the sciences and the world through the personal lens of a person of colour, born in postcolonial India and trained in a 'western' institution proves to be a powerful mode of presentation.

One of the key themes of the book is the challenging of constructed binaries like coloniser/colonised, native/foreign, and nature/culture. Using those conceptual boxes, keeps us stuck in the same framings that we try to overcome. To accomplish this task, Subramaniam argues, we need to be precise, use more words, and understand the life on earth with all its diversity and 'embranglements' (7). When talking about colonialism, words to describe connections oftentimes blur or disguise dynamics of power and create a sense of clear and stable links between people, plants, or scientific disciplines. Instead, her reintroduction of the older term 'Embranglement' highlights tensions and conflicts within connections. Further, drawing on Donna Haraway's concept of 'natureculture' and the findings of Indigenous Studies—both challenge the binary distinction of nature and culture, human and non-human—Subramaniam builds a strong conceptual basis for her argument, that emphasises yet problematises the interconnectedness of the world. In this respect, Subramaniam's approach is comparable to studies of indigenous ecologies, cosmologies, and epistemologies like Robin Wall Kimmerer's *Braiding Sweetgrass* (2013), which have given visibility to understandings of those naturecultural embranglements, overshadowed, suppressed, and oftentimes erased by the ravages of colonialism.

Learning about nature by experience, by touching, smelling, tasting, or interacting with it in whatever way, shape, or form, is way different from learning about it in university. For Subramaniam, entering graduate school in the United States in the biological department meant a harsh break with what she knew from growing up in India. As a child, her 'love of plants was entangled in a botanical knowledge of the everyday. It was a passionate relationship. It was built around not the wilderness but the plants of the gardens, the roadside, the kitchen, and the lush growth in cracks of the concrete' (129). Plants were integrated into life as digestives, beauty products, medicine, games, and musical instruments. Furthermore, in Indian childhood stories and traditional epics like the *Ramayana* and the *Mahabharata*, plants are active agents. In contrast, American Academia did neither see nor value the concrete jungle as nature, and even plants Subramaniam knew got latinised—Linnean names creating a 'world in a different tongue' (29). Since this personal experience probably maps on the

experiences of many people from the colonial and postcolonial world, which saw their realities being replaced by a system that claimed to be natural and universal, Subramaniam impressively manages to make her line of thought accessible yet preserving the compelling strength of her argument.

The second part of the book ('Kinship Dreams|Classifying Plant Systematics') critically revisits the process in which systems of classification and taxonomy ordered, transformed, and reduced diverse, complex, and dynamic plant worlds into biological knowledge. Core of the argument of this chapter is the understanding of naming as a practice of power. Even though this has been a well-established perspective in the post-Foucauldian history of science, the chapter is a necessary step in the journey the author takes her readers on. Coming from a Christian tradition, which understood naming of plants and animals as a divine power—Adam is given the power to name animals (86)—botanists working on behalf of a European monarch claimed a 'natural' and God-given power to name (87). From the early beginnings of colonialism, when Christopher Columbus named the first Island he landed on 'San Salvador', knowing that the local indigenous people called it 'guanahani', to the nineteenth century, when Cecil Rhodes put his own name on places and plants, Linnaean naming practice overwrote a plethora of names, erasing their traditional, practical designations (138). In this part of the book, Subramaniam's streamlined argumentation comes at the expense of painting a nuanced picture of the process at the end of which the Linnean binomial system beat its competitors and became the standard model of classification. Still, not least because the International Code of Botanical Nomenclature continues to regard Linnaeus' works as the official starting point of botanical nomenclature (139), it is reasonable to centre a critical analysis of taxonomical practice around his system and its legacy. Furthermore, Subramaniam is siding with abolitionist and decolonial movements all over the world in her call for a revision of plant names, which is held up by 'western' institutions and policies (97). Even in the cases where we can reconstruct local names for plants, animals or places, overcoming the institutionalised monopolies of the power of naming remains a tenacious and complicated, though not impossible, process.

The third part of the book ('Floral Dreams| Sexing Reproductive Biology') lays out an argument about the human anthropomorphisation of plants and plant sexuality. Drawing on and expanding the foundational studies of Londa Schiebinger, Subramaniam argues that humans looked for human characteristics in the plant world, which was in turn used to naturalise what humans saw as human biology. In doing so, early scientists created the idea of the biological as natural and universal. This was consequential and problematic for a multitude of reasons. First, regarding sex and sexuality, this vision 'was shaped by normative ideas of sexuality premised on binary sex and cis-heterosexuality. Human sexuality was naturalized and universalized through its imposition onto the worlds of plant sexuality' (136). Even though this chapter of the book is mainly about Linnaeus and the legacy of his Latin binomial taxonomical system, Subramaniam is right in tracing the underlying problem of

anthropomorphisation back to Nehemiah Grew (1641–1712). Today sometimes labelled the 'father of plant anatomy', he must in this context also be seen as the initiator of labelling plant parts male or female; notably without any other option. Grew, in ascribing maleness to the plant because the stamen looked like, and functioned like, a penis did in animals, laid the foundation on which, by the mid-eighteenth century, Linnaeus had created a hierarchical system of classification which reproduced and reinforced traditional notions of gender hierarchies and thus 'incorporated fundamental aspects of human social order onto the natural worlds' (136). When reading Grew's '*Anatomy of Plants*, first published in London in 1682, one barely finds a paragraph of plant descriptions without metaphors about sex and marriage or uses of words like penis, testicles, or sperm.

Linnaeus' system, building on this tradition of a highly sexualised view on plants, made those metaphors the main differentiating feature for flowers. Instead of using the established nonsexual terminology of stamen and pistils, he not only introduced *andria* (from Greek for husband—*aner* [ἀνήρ]) and *gynia* (from Greek for wife—*gyne* [γυνή]), but made the 'marriage' and sex life of plants the central theme and even title of his *Nuptaiae Plantarum*. As Londa Schiebinger has shown in *Nature's Body* (1993), Linnaeus' system, in addition to humanising and sexualising flowering plants, contributed heavily to a reinforcement of Eurocentric and patriarchal ideals and understandings of family structures. Expanding on his hierarchy of plants, which used their male parts as the primary markers for classes, ending in andria (male), with orders in the second rank ending in gynia (female), Linnaeus also went on classifying humans, thus laying the scientific foundations to a racist worldview that saw Europeans and European men in particular as the apex of civilisation and humanity. By revisiting this process in the history of science, which overwrote older epistemologies and practices of naming, categorising and ordering, Subramaniam situates herself and her research in a tradition of feminist STS and critiques of science. Taking the interwovenness of the categories of gender, race, class, and colonialism and their rooting in the sciences of the seventeenth and eighteenth centuries as a basis, she makes a compelling case for the need of intersectional and interdisciplinary approaches to tackle the problems of racism, sexism, xenophobia, and transphobia, still very apparent today.

As I mentioned, another way in which *Botany of Empire* follows an interdisciplinary approach is by weaving bits of imaginary literature in between chapters of the book. Here I would like to pick out one of those stories as an example of how Subramaniam beautifully manages to channel the learnings of the preceding chapter into a fictional yet inspiring story. In the Interlude 'Fables for the Mis-Anthropocene: The Queer Vegennials' (170–73), a transnational group of young plant lovers organise for the mission of undoing the colonial gaze (170). For this, they initiate the 'Metaphor Project', which, to pursue a queer politics, imagines new models for humanity inspired by plants' capabilities. In the same way early plant scientists used what they believed to see in plants as a basis for naturalising human sex, gender, and sexuality, the Australian branch of the Queer Vegennials uses the Dungowan bush

tomato with its fluid breeding system as a metaphor for their project towards a community embracing a vast variety of sexes, genders, sexualities, and socialities (171). By historicising and deconstructing the scientific biological knowledge of Grew, Linnaeus, and their contemporaries in the first step, and then following it up with a quasi-utopian, but nevertheless realistic, imagination of a future worth aspiring to, Subramaniam elegantly manages to break out of a mode of criticism that is stuck in a negative view on the past without showing a way forward.

The following part of the book ('Pangean Dreams|Mapping Biogeography') is concerned with the echoes of the reconfiguration of environments through the lasting impact of the Columbian Exchange. At least since the works of Alfred Crosby and Richard Grove in the 1970s and 1980s, European Imperialism has been understood not merely as a socio-political, cultural, and economic process, but also as an ecological one, reshuffling global biota (184). Driven by colonial enterprises and accelerated by industrialised globalisation, plants and people, but also microorganisms and animals were displaced into completely new regions of the globe. For people in the west, immigrants, foreigners and products of the global have subsequently be seen as problems and threats to the local. Drawing on the work of Édouard Glissant, Subramaniam understands "the West" not as a geographical space, but a historical and political project linked to colonialism, the Enlightenment and universalism that organised the world into a hierarchical system of centre and periphery. Interestingly, she makes use of the concept of 'rememory' from Toni Morrison's novel *Beloved* (1987), to grasp how past experiences remain present and active and are imminent to space. For her, the hauntings of colonialism remain engrained in the field of biology, which created the idea of 'invasion biology' predicated on a binary view of nature in place and nature out of place. Even though the history of knowledge offers a number of concepts for the spatiality of knowledge like Christian Jacob's 'lieux de savoir', Subramaniam's use of an idea from a novel dealing with the physical, psychological, and emotional consequences of slavery is a clever manoeuvre, shedding light on the deeply personal impact of repressive systems. Bringing all of those thoughts together, this part of the book criticises biology's invasion terminology, which, by labelling 'invasive' plants as evil even though it was humans bringing them to new places, practices botanical amnesia and rings xenophobic alarms (190). In line with the book's rejection and problematisation of binaries like native/foreign, the chapter shows how in discourses about invasive species to the United States, the term 'native' was reworked. This rhetoric did not only make a plant like the tumbleweed, brought from Russia, into a national icon, but also reframed white settlers as 'native'. In her account of the problems of this perspective on biogeography, Subramaniam makes an important point, emphasising that all undertakings of thinking and working against those racist, imperialist, and xenophobic undercurrents need to start with historicising and contextualising them.

Botany of Empire is an important contribution; not only to biology and botany, but more broadly to science and its histories. Drawing on, connecting, and critiquing

a variety of thoughts and disciplines, Subramaniam manages a balancing act between personal experiences and scientific criticism, between the subliminal and the obvious, between micro and macro. The value of the book does not lie in highly original and new arguments, but in the way it tells its story. From her citational politics to inter- and transdisciplinary methodologies, to raising visibility for suppressed communities and epistemologies, to the use of imaginary literature to make change thinkable and thus pursuable, Subramaniam created a truly inspirational piece of work, rattling and shaking dated assumptions of how to make science. Of course, we need facts and data on which to build our arguments, but it is stories that drive people towards change, especially when faced with resistance. *Botany of Empire* helps us to reconsider and transform the history of science into a history of knowledge, moving away from one natural history towards many stories about nature(culture). As historians, we need to ask new questions, find new approaches and perspectives to be able to tell these rich yet imperfect and conflicting stories. And I agree with Banu Subramaniam that, indeed, as a categorical imperative of being scientists, 'tell them, we must' (Prologue).