Plant Life: The Practice of "Working Together"

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Big Sandreed plant.

The word *plant* emerges from two Latin origins: *planta*, to sprout; and *plantare*, to fix in place. One origin insinuates movement, the other stasis. In French, *plante* offers the same inconsistency, so that the word itself is caught between its meanings as a noun that indicates development, and a verb that implies permanence. This modest etymology suggests an entry into the central argument of my research: plants are objectified as a fixed form of knowledge, such that their aliveness is no longer a subject worthy of human speculation. The plant is wedged between worlds: aggressively weedy or strikingly ornamental, beneficial or useless, either despised or desired as it is naturalized, pacified, or capitalized. All ensuing engagement with plants necessarily chronicles the project of domestication whereby the human subject cannot resist being the active agent, endowed with power and armed with prediction, and more recently, as a pioneer of innovation. Each step—each accumulation of expertise—transforms plant life into a measure of human knowledge. As *plantare* achievements continue to dismember the organism as a whole, plants are recast as tools of science. Images of the plant-object are fixed in the human imagination, a world of forms.

If the *plantare* perspective accrues for botanical scholarship, it necessarily finds its way into spatial practices such as geography, urban design, and landscape architecture. The ensuing results lead to environmental alterations that treat plants as tools, specifications, and statistics, absent agency, movement, behavior, or fundamental biological activity. On the one hand, ecologists warn of increased invasive species that threaten the rich diversity of native plants. Such reports are isolated to the management of ecosystems, such that identifying and preventing invasions converges with the impudence of crop yield models and genetically modified seed stock. In this model, agricultural monocultures are economically sanctioned while novel forest dynamics are critiqued. Most significantly, governments are poised to conserve inherently dynamic relationships while corporations protect production. By virtue of accepting the lineage of ecological truisms that are a product of botanical speculation, landscape architecture is particularly implicated in such debates.

Consider instead the definition of *planta*—to sprout. This verb-status fittingly attends to plants by means of their activity, and existence, a mode of being that helps shed the perception of fixity. *Planta* reveals that a plant is a process, a swarm of activity, and a dynamic planetary force.[1] Thus modified, plant knowledge can be activated by virtue of aliveness, which resonates with the ambition of spatial practices that operate at ecological, regional, and continental scales. By paying close attention to the philosophy of Isabelle Stengers, it becomes possible to recover the relationship between plant and human life, so as to understand how novel spatial practices might emerge from a closer reading of plant life. In particular, mobilizing the Stengerian suggestion of "learning to work together" subverts the role of the human expert in order to reengage a shared context between plants and humans. The embrace of plant life as a vivid entity might yield a remarkable new theoretical scientific ontology.

Indicators of Fixed Practices

The *plantare* perspective is so firmly embedded in modes of inquiry that it is challenging to delaminate the layers of history that define static procedures. A common narrative is offered through the critique of early expansionism, as exemplified by the volume of literature that helps expose the social and ecological impacts of early botanical speculation.[2] Here, plants

1 There is significant debate over the definition of "plant," which is a term most often used to describe green, photosynthesizing organisms. Biologically such organisms are referred to as eukaryotic photoautotrophs. The Oxford dictionary gives the following definition: A living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a permanent site, absorbing water and inorganic substances through its roots, and synthesizing nutrients in its leaves by photosynthesis using the green pigment chlorophyll. OED Online. http://www.oed.com/viewdictionaryentry/Entry/11125.

2 See, for instance, Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007); Richard Grove, *Green Imperialism: Colonial Expansion, Tropical Island Edens, and the Origins of Environmentalism, 1600–1860* (Cambridge: Cambridge University Press, 1995); and Londa L. Schiebinger and Claudia Swan, *Colonial Botany: Science, Commerce, and Politics in the Early Modern World* (Philadelphia: University of Pennsylvania Press, 2005).

are portrayed as an instrument of colonial power, especially through patterns of global trade and the rise of horticultural imports. In the context of 18th-century botany, political power was routed through the enterprise of finding, identifying, and collecting plants mainly for the purposes of increasing the range of medicinal cures, maintaining yield for an expanding population, and profiting from an injection of exploitable raw materials. Such *plantare* procedures help pacify, fix, and label the plant as a form of human knowledge achieved through the objectification of plant life. For instance, the practice of counting stamens is the basis of our entire binomial nomenclature system, lending taxonomical authority to similar species based on shared features. This process of deliberately counting, ordering, and naming was brilliantly designed by Linnaeus in order to distinguish useful from useless attributes. At the time, taking account of the biological world seemed a feasible mission.[3] Binomial research yielded a resource, a system, a language of parts, and finally, scientification of the plant. This dissociative enumeration in parts rarely gets pieced back together again, as scientific classification limits knowledge to the accumulation of traits. Form is prioritized over formation, and the whole perceived as an aggregate of exploitable features.

The ramifications of early plant trade are now superimposed on the procedures that subsequently sanction the manipulation or protection of plants. Plant knowledge now proliferates through the authority of institutionalized scientific disciplines. If the 18th century reduced the plant to its constituent parts in order to sustain an exploitable resource, then the 19th century delineated plant life to generate authority in the form of scientific expertise. All current engagement with plant life derives from the professionalization of the botanical sciences, according to the disciplinary specialization that advanced in the 19th century.[4] Today, common procedures and attitudes toward plant life are entrenched in the methods that are sanctioned by expertise and calculation, including carbon offsetting calculations, greening initiatives, afforestation, and other environmental do-goodisms that paradoxically proliferate at the expense of plant life. Such strategies engage the familiar protocols of designers, who tend to shrink at the authority (and impenetrability) of scientific discourses and therefore promote resolutions based on already established metrics. It is precisely this translation of trust, in science and in problem solving, that is at the heart of all formal aesthetic practices, and of the design professions in particular. As a consequence, the field of science tends to discourage the sensuous, articulate, and communicative subject, further constraining any possibility of interdisciplinary or collective practice. Even today, plant life is analyzed as a fixed backdrop against human and animal intentions. Whether through use or expertise, the project of pacifying plants strengthens human authority. One practice exploits the plant itself, the other, knowledge of the plant.

As adjacent disciplines such as forestry, geography, environmental engineering, and landscape architecture proceed, they rely on a fixed interpretation of plant life, inherited through botanical science, which forms a fragmented intellectual foundation. These adjacent disciplines, too, relay botanical knowledge as fixed—or *plantare*—continuing a tradition of reading the world of plants absent agency, movement, behavior, or fundamental biological activity. This is even more surprising given the extraordinary evolutionary success of terrestrial plant life, and the fact that humans are dependent on plants for most of our material needs. There is no alternative to a narrative of dominance achieved by human authority because any adjacent methodology is considered conjecture and often disregarded as unscientific.

This is not to imply that "all science is bad," or that all botanical evidence inevitably suppresses plant life. Rather, if the plant has become an artifact, tool, or index, it has done so in order to advance a particular form of scientific progress. Even more problematic is the unchecked translation of fixed scientific procedures into strategies of spatial practice. The question then emerges as to how the plant can retain its aliveness in order to collaborate or participate in the research or design process. How does the plant make itself known? When the plant is released from a desiccated one-dimensionality, it transforms into a living, breathing collection of slowly dividing cells. It sheds divisive labels that preclude movement. It is no longer defined by human management techniques, resource dependency, or (especially unpleasant) productive landscapes. Thus conceived, the *planta* perspective appreciates the remarkable behaviors that are exclusive to plants, and resists the urge to make reductive comparisons, including the recent theoretical division between the human and nonhuman.

The Stuff of Nonhuman Theory

The scientization of plant life resonates with conflicts inherent in the production of knowledge, as explicated by Bruno Latour and Isabelle Stengers. In a Latourian sense, the translation of expertise contributes significantly to a revisionist history that has powerfully decentered humans and rendered nonhuman subjects active instigators. In a Stengerian sense, translation not only redistributes expertise but also has the capacity to align with another kind of knowledge production, one that is collaborative and that asserts equal agency for nonhuman subjects. Knowledge production, then, pertains less to translation per se than it does to persuasion. Stengers describes processes that filter objects through human ideas, theories, and categories so that they emerge redesigned, or configured into new arrangements. Stengers does not describe the agency of design in her scholarship, but her account of how typical procedures reinforce solutions alludes to the familiar protocols of designers described above. But rather than a pacified world rendered compliant by the extension of human knowledge—*plantare* as a fixed backdrop—Stengers insists on *planta* agency. In her terms, "working together" is a means to reconfigure the relationship between human and nonhuman.

Paying close attention to the aliveness of plants helps to emphasize other useless antithetical binaries that reduce the world to categories, objects, or measures. Plant life resists such diminutions, appearing in the gap between theory and practice in much the same way that the literature on reductionism has expressed the limits of treating the nonhuman as a passive recipient of human knowledge.[5] For instance, Bruno Latour's concept of a "politics of things" and Donna Haraway's notion of the "encounter" between species help to explain how the world "out there" is apprehended, how knowledge is authorized, and information is situated beyond the laboratory.[6] In Latourian terms, the translation of expertise implicates the scientist in the process of generating material, who therefore also contributes to the revisionist history that has decentered humans and rendered greater agency to the stuff of the nonhuman.[7] Here, the act of translation both redistributes expertise and aligns with forms of knowledge production that find affinity with such worldly phenomena. While distinctions are recast, Latour remains primarily focused on the twisted encounters of humans, which have been manipulated by virtue of a nonhuman protagonist. Objects are bundled together with creative neologisms, such that the key differentiation is made between the human subject and—seemingly everything else in the world. This antithetical binary of human and nonhuman, prevalent in the humanities and social sciences, merely draws attention to the imbrication of categorization in knowledge production, while the plant remains firmly planted in its place. I would like to emphasize what could happen if the plant were no longer considered a *thing* in that translation.

In advocating a practice that acknowledges the scientization of plant life, further categories such as the nonhuman are superfluous. Almost 20 years ago, Bruno Latour sketched out the risk of specialization with fair warning: "It may sound as if we, too, are marching along the same path, in a hurried flight from truth and reason, fragmenting into ever smaller pieces the categories that keep the human mind forever removed from the presence of reality."[8] To move past the "nonhuman" discourse, it is helpful to consider how the constant activity of plant life resonates with concerns inherent in organic form, including the difficulty of generating materials, producing biological evidence, and claiming authority. Stengers, by contrast, refrains from escalating the nonhuman in social and political theory, claiming that the negative prefix—*non*—does nothing to prevent the proliferation of superfluous expertise. Instead, the label furthers the tendency to think in binaries and categories that assimilate knowing and dominating.[9] Stengers contends that nonhumans must be contemplated as existent; otherwise, they endure as objects, which necessarily circles back to problems of knowledge production. In this case, plant life is also something other than the stuff of nonhuman social theory.

"Working with" Plant Life

For Stengers, knowledge production is independent from *translation*—in the Latourian sense—and is defined by an ongoing act of persuasion between scientists. This persuasion is articulated *de facto* yet remains a highly refined opinion of an absolute and distinctly human order. Convincing and arguing with a motive for recognition summarizes the relationship between humans searching to stabilize the enormity of biological life. Stengers articulates such normative scientific persuasions as the filtering organisms through human ideas, theories, and categories. Consequently, they emerge from the persuasion redesigned, flattened, or configured into new arrangements that serve more science. Instead, Stengers proposes that knowledge production occur by including the agency of the organism: "How to succeed in 'working together' where the event does not occur, where phenomena continue (and seem able to continue) to speak in many voices: where they refuse to be reinvented as univocal witnesses."[10] Stengers's suggestion of "working together" implies a modified relationship between human and nonhuman that accepts reciprocity. The event, in this case, is the evidence or proof that makes the subject compliant enough to become a tool of persuasion. Thus, rather than using scientific knowledge to objectify the world, Stengers advocates a research process that is informed (and not just acknowledged) by the researched. Further, she insists that the sciences are at their best when predictability and control are replaced by intellectual enjoyment.[11] Applied to plant organisms, "working together" forces us to abandon the idea that they are fixed entities enduring only for human advantage, and engages the potential of a collaboration between human and plant life.

3 The task of counting plants might have appeared possible when considering the relatively low diversity of plant life found in temperate Europe, but remains unexhausted when applied to the vast biological diversity of other global biomes, such as the tropics.

4 Stengers describes how science is mobilized by the state and capitalist enterprise to accumulate power, arguing that professional consensus and the consolidation of expertise served to invalidate local or artisanal knowledge during the 19th century. See Isabelle Stengers, *Power and Invention: Situating Science* (Minneapolis: University of Minnesota Press, 1997): "Perhaps it is on the basis of what began in the 19th century, and not on what one calls the 'origins of modern science' that we should conceive of present day science" (116).

5 In particular, the "nonhuman" turn is reliant on Latour's explanation of how microorganisms were not the cause, but the witness to epidemics. See Bruno Latour, *The Pasteurization of France*, trans. Alan Sheridan and John Law (Cambridge, MA: Harvard University Press, 1988).

6 Latour casts science as a collective project. See Bruno Latour, *Science in Action* (Philadelphia: Open University Press, 1987); Bruno Latour, *We Have Never Been Modern* (Cambridge, MA: Harvard University Press, 1993). Haraway's insight into the historically situated practices of human primacy highlights the inequality between human and animal species. See Donna Haraway, *When Species Meet* (Minneapolis: University of Minnesota Press, 2008).

7 Latour rejects the traditional objectivity presumed by scientists working in the field and explores the task of generating research materials. See Latour, *Science in Action*, 108–21.

8 Bruno Latour, *Pandora's Hope* (Cambridge, MA: Harvard University Press, 1999), 21.

9 Isabelle Stengers, "Including Nonhumans in Political Theory: Opening Pandora's Box?" in *Political Matter: Technoscience, Democracy, and Public Life*, eds. Bruce Braun and Sarah J. Whatmore (Minneapolis: University of Minnesota Press, 2010), 3–33.

10 Stengers, *Power and Invention*, 89.

11 In *Power and Invention*, Stengers uses *jouissance* in her native French, which refers to a physical and intellectual joy. The term is more theoretical than the typical translation, which replaces *jouissance* with mere "pleasure."

The *planta* perspective builds on Stengers's idea that by accepting research as a collaborative process we can "learn the humor offered to us by reliable and yet multivocal evidence."[12] In other words, plant life can be realigned with design practice such that the production of knowledge is shared and inclusive. Stengers's distinction between subject and object resonates with familiar critiques of scientific progress and the practices of forced conformity. Yet her speculations take this argument further, by proposing that it is not enough to itemize or merely call attention to the discrepancies, failures, and instruments that have made the nonhuman world silent.

In much of her work, including *Power and Invention* (1997) and *The Invention of Modern Science* (2000), Stengers argues for scientific expertise that exposes objectivity and privilege.[13] More precisely, she advocates for a science that extends beyond the boundaries of event, investigation, and technical agreement; for a science that is sanctioned by collective achievement. For Stengers, authority is concealed in the production of objects (rather than the activation of subjects), which necessarily excludes what is unobservable to humans. The result is a "psychological dramatization" that echoes the "geological, geographical, biological, and ecological processes that create spaces, model and drastically alter landscapes, thereby determining the migrations, competitions, or mutual amplifications between processes of growth, proliferations, slow erosions, and brutal disintegrations."[14] Her argument reveals the epistemological reductionism of scientific strategies that suggest the world of processes can be made to conform once they are studied and objectified. For example, the prospect that the drift from linear conformity through an isolated experiment can be applied to the scale of intervention reveals the incompatibility between spatial practice and knowledge production. That *processes create space* echoes these incompatibilities because epistemic access necessarily arrests process for study. If the plant is arrested to further the sciences, then it has done so with great success. But design professionals who claim to work with the "built environment" equally manipulate space using the materials of the "living environment," which is another reason why learning to work together is so relevant to landscape architecture. Rather than explain the adverse effects of hard science or explicate obvious human blunders, Stengers attempts to offer an alternative. Working together resonates with opportunity outside of academic scientific practice and is infused with a rare optimism for the uncertainties of science.

Stengers typically samples from physics and psychoanalysis to structure her arguments. When advocating for the need to work together, however, she draws from a particular case in the natural sciences—the intriguing work of Barbara McClintock, a pioneer of cytology and genetics.[15] McClintock's research in genetics concerned the study of corn, or maize (*Zea mays*), one of the earliest known examples of plant domestication. Stengers likely stumbled onto McClintock's scholarship through her own interest in genetic modification, but her case study nonetheless provides a tremendous example of working with plants. McClintock appealed to the unknown character of maize by engaging imaginatively with the living plant, allowing its adaptations to enter into her investigations. She tracked the singularity of maize down to a microscopic scale and found mobility in the genes that had previously been defined by stability and fixity.[16] Stengers describes this breakthrough in the relationship between the scientist and the subject as an "intervention": "Her great *jouissance* was the moment when a 'small detail' destroyed a grand idea, a superb generalization, when she knew that the corn had, if I can express it this way, 'intervened' between her and her ideas."[17] In the case of McClintock, compliance to a given scientific definition in relation to the world was abandoned for a novel concept, supported by her observations of mobility. McClintock's investigations coincided with the birth of molecular biology, which in turn coincided with the recognition she achieved mid-career when she became a member of the National Academy of Sciences in 1944, and was elected president of the Genetics Society a year later.[18] At the time, the concepts of regulation and control drove geneticists to describe stable strings of genetic code, later replaced by McClintock's famous "jumping gene," for which she garnered a Nobel Prize in 1983. McClintock found animation in genes by letting herself be part of the experiment: "When I was really working with them I wasn't outside, I was down there. I was part of the system. I was right down there with them."[19] On at least one occasion, incorporating irreducible, animated activity into the process of gathering materials and generating data produced a remarkable event in the history of ideas.

The Living Environment

Current research into the role of plants in shaping global climate patterns speculates that the earth's environmental history is actually written in plant evolution.[20] This stunning new research positions plants firmly in the center of the dialogue on climate change using evidence from the fossil record. If ancient fossils are the key to how life on earth was formed, then plant organisms may be freed from the dusty basements of museums and given due recognition for their major role in planetary history. By using the past to decode the future, David Beerling argues that the plant must be reconsidered as an object of scientific study: "The argument is that we must marry these traditional elements of geology with a focus on plants as living organisms to mount a frontal attack on the citadels of received wisdom and orthodoxy and reach a deeper understating of Earth's history."[21] What if previous scientific histories are reformed or reprogrammed so that plants emerge as live, actionable, and conscious characters that have also shaped life on our planet? How would that affect the concept of the Anthropocene?

The plant is the only earthly organism that connects the atmosphere to the territory, literally linking the ground and the sky. The plant is a dynamic actor in this exchange, transforming and adapting to human influences that elevate the achievements of the built environment over the adaptive qualities of the living environment. In contrast, practices such as those enacted by McClintock and emphasized by Stengers resist the highly mechanized prevailing theories that urbanize the living environment, helping us gain traction in another, more collaborative direction. Here, collaboration is understood as the act of working together. Both sanctioned models of scientific inquiry, and the viability of long-held ecological or conservationist traditions, with their preposterous contemporary greening strategies, are at stake in activating plant life today. Moreover, how landscape architects specify, eradicate, insist on, and superimpose plant life within their designs can be significantly retooled. Within the pressing realities of a planetary turn and a changing climate, it is time to incorporate the entire living plant organism into practice. This is not a plea to apply systems ecology to the scale of the plant, just as it is not enough to decide to acknowledge that plants are nonhumans. The crucial point is to learn how new types of practices can emerge in the reciprocal relations, or co-production between plants and humans.

If the -ologies and -isms of spatial practice could be bound to a more collaborative form of botanical research, then the planted world might be appreciated in wholly new ways. This would entail a reading of plants whereby fragmentation is superseded by purpose and agency. I argue that plant life has heretofore been obscured because of the difficulty of actually evaluating animate behavior. And "working together" resists speaking in terms of what is fixed, recognizing that plant traits do not fit nicely into human criteria such as advanced slowness, chemical communication, and concealed rhizography. To deny that plants could be active participants is to deny attributes that are valued in the study of animal or human mobility. The presumption that plant life is sessile and devoid of intelligence overlooks the qualities of biological and territorial aliveness, and ignores the creative collaborations that take place between human and plant life. Stengers's scholarship redirects the attention given to nonhuman categorization and other useless binaries that continue to exclude and pacify plant life. Her work advocates the resourceful invention and passion that have decentered the human and that can also bind practice to a more collaborative form of discovery. We must urgently redress modern scientific techniques that rejected everything that could not be measured or made measurable. Can the plant be studied for its own sake, without furthering the dichotomies of living and nonliving, human and nonhuman?

12 Stengers, *Power and Invention*, 90.

13 Her main arguments hinge on Alfred North Whitehead's exploration of "dynamic" philosophy and Thomas Kuhn's essential description of "normal" science—both of which also attend to the growing divisions between disciplines and subdisciplines. See Alfred N. Whitehead, *Process and Reality* (New York: Free Press, 1978) and Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962).

14 Stengers, *Power and Invention*, 55.

15 Evelyn Fox Keller, *A Feeling for the Organism: The Life and Work of Barbara McClintock* (San Francisco: W. H. Freeman, 1983).

16 Necia Parker-Gibson, "Profiles in Science for Science Librarians: Barbara McClintock, Seeing What Is Different," *Science & Technology Libraries* 32, no. 4 (2013): 315–29.

17 Stengers, *Power and Invention*, 111.

18 Evelyn Fox Keller, *A Feeling for the Organism*, 4.

19 Ibid., 117.

20 For an in-depth discussion of experimental paleobotany, see David Beerling, *The Emerald Planet: How Plants Changed Earth's History* (Oxford: Oxford University Press, 2007).

21 Ibid., 3.

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