H. G. Wells's Plant Plot: Horticulture and Ecological Narration in *The Time Machine*

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> "[T]he day will come when all our roses, even moss-roses, will have evergreen foliage, brilliant and fragrant flowers, and the habit of blooming from June till November."
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> —Darwin, *The Variation of Animals and Plants Under Domestication*[1]

> "Everything was so entirely different from the world I had known—even the flowers."
>
> —H. G. Wells, *The Time Machine*[2]

1. Introduction: *The Time Machine* and Ecological Narration

When H. G. Wells's Time Traveller returns from his journey to the year 802,701, he offers "two withered flowers, not unlike very large white mallows" as proof of his story (121). While his skeptical audience dismisses the Time Traveller's narrative, the flowers excite more interest. The Medical Man notes the oddness of their pistils and asks the Time Traveller to let him classify them, but the Time Traveller refuses his request. This brief argument over the Time Traveller's flowers is an apparently unimportant episode in Wells's novel. But it is also a moment that might provoke readers' questions: Why do the Time Traveller's listeners consider the taxonomical placement of these examples of future flora, rather than the probability of the Time Traveller's tale? In fact, why focus on flowers at all when the Time Traveller has just described the fate of human civilization? I argue that the Time Traveller's flowers point us to an as-yet unacknowledged aspect of Wells's text, the novel's thematic engagement with contemporary horticulture's attempts to achieve a human-engineered flora. Furthermore, the flowers' interaction with the Time Traveller's narrative in this episode—they are meant to function as evidence for his story but actually upstage it—suggests a broader

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narrative pattern of human-plant interaction, as the novel's plants and people compete for narrative attention.

The Time Machine's plants have been largely neglected, despite the fact that Wells's work has frequently been studied from a scientific and specifically biological perspective.[3] Such readings build on his extensive training in and engagement with biology: he studied under T. H. Huxley, wrote a biology textbook for use in a correspondence course, and was a frequent contributor of science pieces to periodicals. In many of his writings, Wells shows a preoccupation with extinction and degeneration, and it is through these lenses, focused mainly on his human characters, that *The Time Machine* (1895) is most frequently read. This human-centric focus was expressed by Wells himself, who argued that *The Time Machine*'s Eloi and Morlocks show how humanity could develop along "divergent lines" if the class structure of fin-de-siècle England were carried far into the future.[4] Yet although Wells privileges what happens to the humans in his text, and although later critics have followed his example, his training in biology also enabled him to create a distinctive natural environment in *The Time Machine*.[5] Like its human inhabitants, this new environment is described as resulting from fin-de-siècle trends: Wells imagines the flora of the future by predicting that the nineteenth-century horticultural improvement practices of artificial selection and hybridization have been carried to their logical endpoint. By 802,701, plants have been fully altered to suit human needs and desires and exist in apparently "perfect harmony" with all other parts of the ecosystem (92).

This description of *The Time Machine*'s plants living in "perfect harmony" with the novel's humans aligns with recent critical readings of plants in Victorian narratives. Elizabeth Carolyn Miller and William A. Cohen, for instance, have both emphasized the peaceful entanglement of humans with vegetal nature by pointing to Thomas Hardy's elision of the distinctions between humans and plants. Miller describes Hardy's practice of what she terms "dendrography," a form of environmental realism that "strives to represent the natural world more accurately by inhabiting the scale and perspective of the arboreal."[6] Similarly, Cohen suggests that Hardy experiments "with the sense that the human body and the natural world are of a piece, each shaping the other to its purposes in both material and conceptual terms," a mode that Cohen terms "arboreality."[7] Miller and Cohen point to a largely harmonious relationship of mutual interdependence between humans and the vegetal (specifically arboreal) world, with Hardy's

realism focused on depicting how humans are "coproducing and provisioning a place in concert with other beings."[8] Plants and humans might be seen as narratively merged in these works and in narrative depictions of the late Victorian landscape more broadly, as the plant and human plots in fin-de-siècle realist fiction develop to similar narrative ends.

The Time Traveller's initial impressions of the future world similarly emphasize a serene landscape, which the Time Traveller believes has been achieved through the perfection of horticultural breeding. However, the novel undercuts this initial vision of harmony by offering, and ultimately endorsing, a parallel portrayal of ecological competition. Human competition—between the two human-descended tribes of Eloi and Morlocks, and between the Time Traveller and the Morlocks—occurs explicitly in the novel and has been the focus of much critical attention. But I argue that *The Time Machine* also implicitly dramatizes a contest between its human and nonhuman characters, specifically, its plants. Rather than treating plants "merely as backdrop, ancillary to the [novel's] main event,"[9] I argue that Wells's narrative is marked by the emergence of a plant plot that competes with the novel's human plot. This "ecological narration" model refracts the Darwinian contest for limited resources onto narrative, with humans and plants vying for limited narrative attention. Despite their initial focus on humans, both the Time Traveller and his immediate audience of listeners find themselves distracted by fruits and flowers, and as the narrative repeatedly returns to the Time Traveller's botanical impressions, the novel's reading audience is also asked to pay attention to plants. This contest for narrative attention between plants and people within the text thus extends to readers' attention as well: trained to focus on a text's humans, readers continually find themselves reading about the future vegetal world.

I would argue that this narrative model of human-nonhuman competition is broadly applicable to nineteenth-century literature, offering a new way to understand what might more frequently be considered narrative detours or inscrutable distractions from the novel's main (human) plot. But while this model might be applied to any nineteenth-century narrative, *The Time Machine*'s engagement with contemporary horticultural concerns makes it a particularly dramatic example of human-nonhuman competition. Nineteenth-century horticulturalists celebrated a narrative of a human-controlled environment—one that our human-centered critical practice has often perpetuated. Wells's novel imagines a future earth in which this human endeavor to control nature has

been fully pursued, only to be replaced by an entirely different plotline. In this ecological narrative, the novel's humans degenerate and its human plot dissolves, while the novel's plants thrive, with the plant plot persisting to the novel's final sentences. The endurance of *The Time Machine*'s plants suggests both environmentalist and narrative takeaways. Implicitly endorsing the environmentalist position that humans should refrain from interfering with the natural world, the novel describes how humans' environmental engineering is rendered ineffective by a flora that outlasts their efforts. Plants similarly challenge humans' narrative prominence in the text. The novel's plants and people compete for narrative and readerly attention, in a narrative model that suggests competition within the narrative environment reflects competition in the natural world.

2. Plants of the Present: The Urge to Improve

The Time Traveller's description of the world of 802,701 is botanically specific. He tells his listeners that his time machine landed in a bed of rhododendrons, recognizable by their familiar mauve and purple flowers (79). In addition to the rhododendrons, the Time Traveller also notes the presence of silver birch trees, hawthorns, evergreens, and acacias. While he recognizes these plants as roughly equivalent to their fin-de-siècle counterparts, other plants seem to have undergone radical changes in the intervening years. Raspberries and oranges have become "hypertrophied" or abnormally enlarged (85); some flowers have grown strange spiked leaves and developed waxy petals (84); and, although he recognizes what seem to be nettles, this new manifestation of the species no longer stings (88). The Traveller also encounters numerous plants that he has never seen before. He tells his listeners of "beautiful flowers altogether new to me" (83–84) and fruits that are "strange" (85). His overall impression is of an environment made alien by such flickers of familiarity. His journey several hundreds of thousands of years into the future is a journey away from familiar nineteenth-century flora and into a new botanical age.

While the Traveller is disoriented when facing the future world's flora, he is not surprised to find new plant species and improvements of familiar ones. Rather, he considers the fruits and flowers of the future "what . . . countless years of culture had created," the products of thousands of years of human cultivation and modification (83–84). As James A. Secord has shown, knowledge about plant and animal breeding

was "very widely diffused" in nineteenth-century Britain,[10] as the country underwent a botanical renaissance akin to that of the sixteenth century, when plants from the American "new world" were first imported into Britain. The Victorian era's burgeoning horticultural press, which catered both to the rising middle classes newly able to afford suburban gardens and the elite owners of country estates, discussed plant cultivation practices and promoted various selection and hybridization techniques.[11] Both professionals and amateurs eagerly capitalized on this new knowledge of plant breeding.[12] As technologies improved, enormous numbers of exotic plants became available for botanical breeding experiments. Dr. Nathaniel Bagshaw Ward's invention of the closely glazed glass case (or "Wardian case") in 1829 enabled the reliable importation of foreign flora, and with the 1845 repeal of the glass tax and improved technologies for manufacturing glass and cast iron, it became increasingly possible to propagate and modify these tender exotics in glasshouses.[13] These introduced species were enthusiastically hybridized with indigenous species.[14] New varieties were advertised to a plant-hungry public, with the best specimens admired and awarded prizes at popular fruit and flower shows.[15] In sum, the Time Traveller sets off from a society broadly preoccupied with horticultural improvement and from a time and place that offered new opportunities for improvement practices, and he interprets the future world according to this frame.[16]

Aligning their work with a broader cultural privileging of progress, nineteenth-century horticultural writers described their efforts to manipulate vegetal forms as small but essential steps toward the betterment of the Victorian environment; they insisted that their goal was to modify plants as well as grow them. The horticultural writer John Lindley argued in 1831 that "there are two great considerations" in contemporary horticulture, "AMELIORATION and PROPAGATION."[17] To ameliorate plants is to mold them to better fit human ideals; to propagate these plants is to replicate and disperse them in their newly perfected forms. Lindley's dictum to ameliorate and propagate is thus a call to his fellow horticulturalists to reenvision the botanical constituents of the British environment.

Two of the main techniques used to "ameliorate" plants were artificial selection and hybridization. Charles Darwin had described how artificial selection can instill human-desired changes in new generations of plants or animals in *On the Origin of Species* (1859). Darwin refers specifically to botanical precedent when he uses "the increased size and beauty which we now see in the varieties of the heartsease, rose, pelargonium,

dahlia, and other plants, when compared with the older varieties" to outline how the rapid changes induced by artificial selection can lead to plant species' divergence from their wild or comparatively less cultivated botanical ancestors.[18] While Darwin's interest is in speciation, horticulturally minded readers of his work would focus on humans' ability to change plants through artificial selection. This process of modification is accumulative and gradual, as the most promising individuals in each generation, or those that show desirable traits, are culled and crossed; the method is repeated with each new generation until the trait becomes fully apparent.[19] The rate at which a species changes depends on its "plastic[ity]," or its tendency to variation and amenability to consecutive cultivation (Darwin, *Origin*, 21). As Darwin shows in his choice of examples, plants can demonstrate particularly dramatic changes both because each new generation is large—and so often includes a fair amount of natural variation—and because plants can be easily and rapidly propagated.[20] Frequently operating in tandem with artificial selection, hybridization crosses two varieties or similar species, often either through an interchange of pollen (sexual crossing) or through one of a variety of asexual techniques, like grafting two specimens together. Hybridization's goal is either to use one plant's traits to modify the other or to create an intermediate form. Horticulturalists deployed these two techniques to bring about relatively rapid and dramatic changes in plants, "ameliorat[ing]" them to better suit human needs and desires.

When the Time Traveller identifies horticultural practices operating over long periods of time as the cause for the vegetal variations and new species present in 802,701, he extends into a projected future what many Victorians understood to be cultivation's lengthy development. It was a commonplace in Victorian horticultural works to describe cultivation's lengthy history, which the horticulturalist F. W. Burbidge dates to "time immemorial."[21] Darwin similarly sketched a long history of artificial selection. In the *Origin*, he insists that "it is very far from true that the principle is a modern discovery" (39), dating the origin of the Victorian pear, for instance, to ancient times: "the gardeners of the classical period, who cultivated the best pear they could procure, never thought what splendid fruit we should eat; though we owe our excellent fruit, in some small degree, to their having naturally chosen and preserved the best varieties they could anywhere find" (42–43). Darwin simultaneously conveys the limited ability of cultivators to imagine the eventual products of their work—a scenario witnessed in the Time Traveller's encounters with unfamiliar fruits and flowers—as he also pays homage to these early breeding

efforts, which laid the groundwork for Victorian practices. In the *Variation*, Darwin's reflections on artificial selection's progress are governed by his observations of primitive people's relationship to plants. "Accustomed as we are to our excellent vegetables and luscious fruits," he argues, "we can hardly persuade ourselves that the stringy roots of the wild carrot and parsnip, or the little shoots of the wild asparagus, or crabs, sloes, &c., should ever have been valued; yet, from what we know of the habits of Australian and South African savages, we need feel no doubt on this head."[22] Darwin draws a hypothetical line of descent from wild carrots, parsnips, asparagus, crabs, sloes, and their "wild" cultivators to their "excellent" and "luscious" descendants and their civilized cultivators. More highly cultivated plants are easier to grow and offer greater nutritional dividends than their wild counterparts; in this progressivist model, the cultivation of these plants is aligned with advancing human civilization.

Darwin describes a long genealogy of artificial selection, but many nineteenth-century horticulturalists emphasized what they believed to be Victorian preeminence in the practice: they argued that through their coupling of artificial selection with artificial hybridization, their horticultural efforts were both more nimble and successful than those of earlier times.[23] Although natural hybridization has always occurred freely among plants, Victorian horticulturalists emphasized their development of artificial methods that allowed humans to control the process. Lindley points to an eighteenth-century origin for the development of artificial hybridization, which he characterizes as "the most important controlling power that we possess," because artificial hybridization was made possible by work on plants' sexual differentiation.[24] With new knowledge about sexes in plants, horticulturalists were able to hybridize them or "exer[t] a most extensive influence over alterations in the vegetable kingdom."[25] The horticulturalist and famous rosarian William Paul traces a similar progressive history, pointing out that "Roses were grown from seed at least two thousand years ago, and the seedlings would no doubt vary in appearance of plant and flower even then." Natural variation "would go on widening and increasing up to a certain period, and finally the hybridizing and cross-breeding of modern times comes into play."[26] Nineteenth-century artificial hybridizing and cross-breeding are rhetorically positioned as the long-awaited culmination of natural processes that have continued over thousands of years. In this way, horticulturalists over the course of the century pointed to Victorian horticultural practices as the crowning achievements in horticultural development thus

far. But their longue durée view of horticultural history also demonstrated that they expected their plant improvement practices to continue far into the future, with still greater developments projected.

In triumphant language, Victorian horticulturalists celebrated their efforts as part of a heroic endeavor to increase human domination over nature, eventually yielding a future natural world—as yet barely imaginable—perfectly modified to fit humans' needs and desires. Human efforts to transform wild fruits into domestic varieties, which Lindley likens to "[t]he constant dropping of water" wearing away "the hardest stone," offer just one example of how "the reason of man [will] in time compel all nature to become subservient to his wants or wishes."[27] Horticulturalists' efforts to subjugate the earth were projected to become more successful, ambitious, and all-encompassing in future years. Instead of hybridizing "two or three, or at the outside, half a dozen species," future rose breeders would hybridize dozens of species, producing "beauties" that Victorians "did not dream of at present."[28] Nineteenth-century horticulturalists anticipated that their descendants would continue their work of horticultural improvement and environmental subjugation more fully and perfectly than they had; these heroic efforts could lead, eventually, to the very different botanical species that the Time Traveller witnesses in the future world.

Victorian horticulturalists looked to the future in part because—despite their rhetoric celebrating their increased power to control nature—they realized that their efforts were imperfect and their dominion over the natural world was more limited than they wished. Horticulturalists repeatedly reported their frustration or discontent with the results of their plant modification practices. For instance, although the horticulturalist Shirley Hibberd acknowledges "the progress" of dahlias in "every desirable quality" over the past several decades, he insists that "the best flowers we possess are far from perfect."[29] The auricula specialist F. D. Horner similarly writes of these flowers that "all classes of the Auricula as yet dwell, like our own selves, in that largest room in all this world—the 'room for improvement.'"[30] As they lament the stunted achievement of their horticultural aims, Victorian horticulturalists admit the present difficulty of realizing their visions. Hibberd may argue that "it is in the nature of man to impress upon the forms of things he is interested in his own idea of what they ought to be" (9), and that improved flowers show "the power of man in modifying organic forms, and of impressing on the world around him visible embodiments of his own abstract notions" (14). But he also acknowledges

that modification practices are "subject to rules that have nature for their foundation" and that "cultivation only encourages nature in certain directions, and selection does the rest" (9). Though Hibberd and other Victorian horticulturalists pointed to complete mastery over the natural world as their goal and rhetorically situated their work as a battle to overcome nature's intransigence, they also acknowledged that their efforts to control nature were outweighed, in their period, by their imperfect domination of it.

Perhaps the most obvious indicators of humans' limited abilities to modify nature were the reversion, degeneration, and sterility found in selected and hybridized plants. Darwin noted the commonness of reversion to an earlier form in the products of hybridization, as "the offspring from a cross between two species or varieties, whether effected by seminal generation or by grafting, often revert, to a greater or less degree, in the first or in a succeeding generation, to the two parent-forms."[31] This problem preoccupied commercial horticulturalists as well as botanists, since reversions threatened the marketability of "new" flower types. Plants could also stymie horticulturalists' efforts by degenerating. To some degree, degeneration was considered the natural result of plants reaching maximal points of cultivation. "After a few years' duration in vigour, a plant naturally dwindles away, splits up, or blooms itself out," Horner states.[32] Hybridized and highly selected plants could also become "almost diseased by repletion," "excessively florid," or sterile "mules," unable to pass on their improved qualities to offspring.[33] The possibility for reversion, degeneration, or sterility to occur because of humans' horticultural efforts all indicated that horticulturalists' attempted supremacy over nature was not yet complete: the perfection of these horticultural techniques could only be possible in an imagined future.

3. Plants of the Future: A New Eden on Earth

Given horticulturalists' hopes for future plant improvements, the Time Traveller's journey far into the future becomes, in part, an attempt to evaluate whether cultivation has succeeded to the degree that its nineteenth-century practitioners hoped it would. The Time Traveller's first thought on stopping his time machine in the future is, "What might not have happened to men?" (80). But even as he attempts to answer his questions about the future world's humans and their mode of civilization, he finds himself preoccupied by the future world's vegetal inhabitants.

The Time Traveller's impressions of the future environment align with nineteenth-century horticulturalists' hopes, as he seems to have arrived in a world perfectly modified to fit human needs and desires.[34] Just as his peers anticipated, the future world's flora impress the Time Traveller with the inadequacy or "clumsiness" of nineteenth-century horticultural practices when compared to those developed by later generations:

> Our agriculture and horticulture destroy a weed just here and there and cultivate perhaps a score or so of wholesome plants, leaving the greater number to fight out a balance as they can. We improve our favourite plants and animals—and how few they are—gradually by selective breeding; now a new and better peach, now a seedless grape, now a sweeter and larger flower, now a more convenient breed of cattle. We improve them gradually, because our ideals are vague and tentative, and our knowledge is very limited; because Nature, too, is shy and slow in our clumsy hands. Some day all this will be better organized, and still better. That is the drift of the current in spite of the eddies. The whole world will be intelligent, educated, and cooperating; things will move faster and faster towards the subjugation of Nature. In the end, wisely and carefully we shall readjust the balance of animal and vegetable life to suit our human needs. (90–91)

The Time Traveller emphasizes the very limited nature of Victorian horticultural efforts, both in scope—few plants and animals are modified—and in scale, as Victorian horticultural goals are limited to the achievement of marginal improvements, or making plants "better," "sweeter," and "larger," rather than achieving more dramatic changes. Like nineteenth-century horticulturalists, he recognizes the shortcomings of Victorian cultivation practices, which are limited both by human ignorance and natural inflexibility. But alongside his articulation of Victorian horticulture's comparative failures, the Time Traveller also expresses the same anticipation of the "subjugation of Nature" voiced by his nineteenth-century peers. In the future natural world, he imagines that he sees a complete conquest over vegetal and animal species, as they have now been modified (or "readjust[ed]") to "suit" the environment's human inhabitants.

This complete subjugation of the future world's plant and animal species would be impossible, however, without reengineering the environment more broadly. In the nineteenth century, artificially modified plants had to be cultivated in environments that were also artificially modified. Tender annuals were sheltered in greenhouses until temperatures warmed enough for them to be planted outdoors, while many

imported exotics were grown permanently in artificially warmed and humidified conservatories. Even if artificially modified plants were hardy enough to survive Britain's fall, winter, and early spring, they still required human help, through fertilizers and regular weeding, thinning, or splitting, to thrive. Gardens were meticulously ordered, frequently enclosed environments subjected to newly "scientific" improvement practices such as manuring and plant rotation. "The garden is a laboratory, in which experiments are continually being carried out," Burbidge proclaims, emphasizing the artificial and carefully controlled nature of nineteenth-century gardens.[35] It was commonly acknowledged that most highly cultivated plants could only survive in environments that were modified to suit their needs. Because "the state of nature [is] hostile to the state of art of the garden," T. H. Huxley noted in his "Prolegomena" (1894), the "state of Art" achieved within a garden's walls would quickly degenerate "if the watchful supervision of the gardener were withdrawn."[36]

In 802,701 these small, specially planned and carefully supervised gardens of the Victorian period have been expanded to cover the perceivable environment, where they flourish without human superintendence. The Time Traveller's initial impression of the place where his machine lands is that it seems to be "a little lawn in a garden" (79); when walking with the Eloi he notes that they appear to be passing through "a long-neglected and yet weedless garden" (84); and when he climbs a hill to overlook the future world, he discovers that in fact "the whole earth had become a garden" (90). His progressive realization of the extent of the new world's garden space enacts the predictions of nineteenth-century horticulturalists, who anticipated the gradual expansion of their power over the environment. The Time Traveller interprets this environmental transformation as evidence of their work. He sees in the world of 802,701 an entire "subjugation of Nature," as artificially modified plants are no longer limited to small, enclosed, and highly cultivated spaces. This expansion of garden-space has occurred partly through the disappearance of barriers and other, competing ways of using the land—the Time Traveller notes that there are "no hedges" and "no evidences of agriculture" (90)—and also through the modification of the future world's climate, which resembles the one artificially produced in nineteenth-century conservatories. When the Time Traveller is traveling to the year 802,701, he suggests that the changing of the seasons seems to have ceased; as the years tick by, his surroundings change to "a richer green" uninterrupted by the typical "wintry

intermission" that he saw when traveling through earlier centuries (78). Upon landing in the future, he notes how warm the air is and remarks that the future world's weather is "much hotter than our own" (81, 106). Britain seems to have transformed into a tropical island, a place of permanent summer where the Victorian period's tender annuals and imported exotics can thrive year-round.

The boundary-less garden of 802,701 appears to be a new Eden, finally realized through the gradual perfection, over hundreds of thousands of years, of Victorian plant modification practices. Carolyn Merchant describes this development of "docile, domesticated plants and animals" as one part of the Western effort to "restore order" lost with the expulsion from Eden.[37] As Richard Drayton has noted, contemporary gardens were perceived as "fallen": "living things were out of balance, as the failure of crops, regular famines and plagues testified." Horticulture hoped to reestablish what had been lost, to identify and develop "all the elements of perfection . . . contained in [nature's] imperfect order."[38] Nineteenth-century horticulturalists explicitly identified their efforts as small steps toward the realization of a new Eden. The Victorian horticultural writer William Carew Hazlitt pointed specifically to the Edenic model, suggesting that Victorian gardens "have a sort of foreshadow in the Book of Genesis."[39] Commenting on nineteenth-century horticultural endeavors, Huxley similarly noted the ambition to reestablish "an earthly paradise, a true garden of Eden, in which all things should work together towards the well-being of the gardeners." In this newly engineered garden space, "the coarse struggle for existence of the state of nature, should be abolished," with the "state of art," or selection, prevailing instead.[40] The "whole earth" had once been a garden, according to Christian belief, and Victorian horticulturalists aimed for a future in which "the whole earth" would again become a garden. The Time Traveller imagines that he has entered this newly realized Eden. He calls the world of 802,701 a "Golden Age" (106) or a lost, idealized pastoral era. As Raymond Williams notes, humans tend to locate the loss of the golden age in the almost immediate past, typically in the half-century before the author's writing.[41] In this case, the Time Traveller describes a new golden age in the distant future; he suggests that horticultural strivings have led to its restoration, as a uniformly "exuberant richness" now (again) covers the visible earth (100).

This wholesale transformation of the natural environment into a new Eden has been achieved in part through the loss of the regulating or predatory species that would inhibit fruits' and flowers' flourishing.

The Time Traveller remarks that the air no longer contains gnats, just "brilliant butterflies," which could be this era's pollinators; there are also no weeds or fungi to compete with or attack the new world's plants (91). Gone, too, are the animals that were such a familiar part of the Victorian ecosystem: the Time Traveller notes that "horses, cattle, sheep, dogs, had followed the Ichthyosaurus into extinction" (85). This is particularly remarkable because each of these species had been carefully bred over generations, a trend in which the Victorians participated—many of Darwin's examples of artificial selection in the *Origin* and *Variation* are of horses, cattle, sheep, and dogs. Were these animals hunted into nonexistence by the Eloi and Morlocks' progenitors? Did they fail to survive the adjustment to a uniformly tropical climate? Or were they bred into the degeneration and eventual extinction that the Time Traveller anticipates in the humans he encounters?

The Time Traveller quickly passes over the loss of these animals, but the fact of their extinction can be seen in the fate of the future world's plants. With the warm climate and their natural checks largely removed—the Eloi are not numerous or industrious enough to eat all the fruits or pick all the flowers (and the Morlocks are not interested in exploiting these plants, except as grazing material for the Eloi)—this is an environment of perpetual growth, and the plants steadily grow over the physical remnants of human control. The Time Traveller witnesses this quiet vegetal takeover, although he does not interpret it as such: the arms of the hillside seat from which he contemplates the landscape are "half-smothered in soft moss" (89), and he returns from his journey marked by the plants of the future, his coat "smeared with green" (71).

In outlining his initial analysis of the future world, the Time Traveller remarks that "This adjustment, I say, must have been done, and done well: done indeed for all time, in the space of Time across which my machine had leapt" (91). The "adjustment" is the perfection of horticultural practices; he argues that the future world's flora, and the environment modified to support its growth, are evidence of the entire "subjugation" of the natural environment to suit human needs and desires—its transformation into an Edenic "technosphere," in Heidi C. M. Scott's words.[42] Like Victorian horticulturalists who anticipated the heightened success of their efforts in the future, the Time Traveller attests to the power of humans in modifying nature. He believes that he is witnessing a human-authored plot of horticultural domination. But the Time Traveller should take note of the fact that when he arrives

in the future world, having traveled from an era in which people mold plants to fit their ideas of perfection, he must share his seat of surveillance, not with the Eloi or the Morlocks, but with the moss already established there.

4. Ecological Narration

When the Time Traveller visits the Palace of Green Porcelain, located on the site of the nineteenth century's South Kensington Museums, he regrets that when searching for vegetal specimens, he finds only "a brown dust of departed plants: that was all!" in its display cases, and remarks, "I should have been glad to trace the patient re-adjustments by which the conquest of animated nature had been attained" (129). The process by which horticultural changes produced the future's plants may be untraceable, but the Time Traveller finds the impact of these changes on the other inhabitants of the world of 802,701 clearly visible. As he elaborates several different theories over the course of the novel to describe the relationship of the Eloi to their environment, and then to explain the connection between the Eloi and Morlocks, the Time Traveller continuously takes as his starting point what he believes to be the "conquest" of the natural environment. This "subjugation of Nature" (91), the Time Traveller argues, has had important consequences: "[W]ith this change in condition comes inevitably adaptations to the change. What, unless biological science is a mass of errors, is the cause of human intelligence and vigour? Hardship and freedom: conditions under which the active, strong, and subtle survive and the weaker go to the wall; conditions that put a premium upon the loyal alliance of capable men, upon self-restraint, patience, and decision. . . . Humanity had been strong, energetic, and intelligent, and had used all its abundant vitality to alter the conditions under which it lived. And now came the reaction of the altered conditions" (91–92). The Time Traveller argues that an overly placated environment prompted the evolutionary decay of humans' best qualities. He continually reiterates this explanation, suggesting a few pages earlier that the lack of sexual differentiation in the Eloi results from the abundant resources of their surroundings (88–89), and stating later that "It is a law of nature we overlook, that intellectual versatility is the compensation for change, danger, and trouble. An animal perfectly in harmony with its environment is a perfect mechanism. . . . There is no intelligence where there is no change and no need of change" (141). Wells emphasized this point when

sending Huxley a copy of the novel, identifying its "central idea" as "degeneration following security."[43] Critics have followed Wells's lead, pointing to passages like these as evidence of Wells's investment in Darwinian evolutionary theory and the theories of devolution or degeneration that were derived from it. At these moments, Wells's narrator explicitly imagines how humans would evolve under changed environmental conditions, much as Darwin describes how species evolve in response to environmental constraints.[44]

Discussing the novel in terms of evolution and degeneration has tended to focus attention almost exclusively on changes in its human characters. But although Wells himself set this precedent for prioritizing the humans in his narrative—both through the Time Traveller's interest in them and Wells's own glosses on the novel's meaning—he also recognized that human dominance was, in the long sweep of history, only a contemporary phenomenon. A few years before writing *The Time Machine*, he described his peers' blinkered anthropocentrism: "The earth is warm with men. We think always with reference to men. The future is full of men to our preconceptions, whatever it may be in scientific truth."[45] Wells's diagnosis of his peers' anthropocentrism presciently anticipated how his novel would be interpreted, as critics continue to focus on how this future vision is or is not "full of men." However, I suggest that such readings neglect an essential element of the novel's "scientific truth": its interest in the ecological competition between its people and its plants.

To pay attention to the novel's plants is to take an "ecocentric" rather than anthropocentric critical perspective, enacting a form of reading that, according to Robert Kern, "resist[s] the tendency of the text itself (or of our conditioning as readers) to relegate the environment to the status of setting."[46] When a narrative's natural environment is not cordoned off as scenery, then its botanical constituents can be situated as actors experiencing their own plotlines within the novel's story. In this reading, "nature is an active subject, not a passive object,"[47] as agency is "*distribute*[*d*] . . . as far and in as *differentiated* a way as possible."[48] In the narrative model that I call "ecological narration," the plants of *The Time Machine* can be interpreted as narrative agents enacting a plotline of their own. They might be seen as minor characters who have been "constrict[ed] . . . into highly specialized roles," in Alex Woloch's words.[49] Like the human minor characters that Woloch examines, *The Time Machine*'s plants compete with the novel's main (human) characters for narrative attention. This competition mirrors the environmental

"Struggle for Existence," in which different species specialize for certain niches as they strive to exploit similar resources (Darwin, *Origin*, 65).[50] In Wells's novel, plants and humans "jostle for limited space within the same fictive universe" (Woloch 13), competing both for ecological niches in the novel's story and narrative attention in its discourse.

In the novel's story, this competition between people and plants frequently manifests spatially, in a mirroring of ecological competition for limited resources. Descriptions of plant-person competition occur even in Wells's earliest version of what would later become *The Time Machine*, "The Chronic Argonauts" (1888), in which "white roses and daedal creepers" "invad[e]" the decaying home destined to shelter Dr. Moses Nebogipfel, Wells's initial rendition of the Time Traveller.[51] The narrator proclaims that nature "was taking over, gradually but certainly, the tenancy of the old Manse,"[52] as flowers replace humans as the home's inhabitants—and also apparently usurp humans' role in controlling the environment, as these plants seemingly gain a kind of ownership by "taking over . . . the tenancy."[53] Throughout *The Time Machine*, the Time Traveller similarly notes how plants literally take the place of humans. They grow in abandoned human buildings and atop human seats (88, 89); "bits of grass and moss" even cling to the Traveller's time machine, as his peers note upon his return (152). In describing the way in which plants grow into spaces either typically or formerly occupied by humans, the Time Traveller shows how plants capitalize on the lack of environmental constraints governing their growth to overtake the novel's spaces.

The Time Traveller's comments on plants' expansive growth establishes plants as narrative actors featuring in their own plotline. Serenella Iovino and Serpil Oppermann have recently argued that "matter itself [is] a text," with the growth cycle of organic matter, or its "process of becoming," constituting a narrative. The growing plants in *The Time Machine* can be read as "*site*[*s*] *of narrativity*" that express their narratives through "the very structure of [their] own self-constructive forces."[54] The Time Traveller's repeated descriptions of growing plants are thus not simply moments of scene-setting but also instances in which he notes the persistent presence of a plant plot.

The Time Traveller's description of this vegetal takeover is also a textual takeover, as the novel's descriptions of plants' presence grant them space in the narrative that might otherwise have been devoted to describing the novel's human characters. This distribution of narrative attention pits the portrayal of human subjectivity against what John Plotz has called

the "antisubjective impersonality" of environmental detail.[55] While *The Time Machine* lavishly describes the future earth's environment, it grants less narrative space to detailing the subjectivity of the novel's human characters (with the exception of the Time Traveller). Aside from Weena, the Eloi and Morlocks are largely undifferentiated. The individualities of the Time Traveller's listeners are similarly limited mainly to their names, which convey their narrative function (the Medical Man, the Provincial Mayor, the Psychologist, the Very Young Man, the Editor, and even the Time Traveller himself). The frame narrator describes this mode of naming as "convenient" in relation to the Time Traveller (59). But this "convenient" narrative decision also subsumes the Time Traveller as an individual to his narrative function. The Time Traveller's chorus of barely differentiated audience members similarly demonstrates the novel's prioritization of narrative functionality, or the identification of the narrative niche that each character fills, over the elaboration of human characters' subjectivity. This lack of narrative attention to human subjectivity allows the narrative to emphasize the "microscopic description" of environmental detail instead.[56]

The fact that human characters' differentiation is largely limited to their names also implicitly aligns the novel's humans and its plants. Like the novel's humans, whose names distinguish their narrative functions, the novel's rhododendrons, acacias, silver birches, and raspberries are similarly introduced by names that briefly identify their classificatory placement: the novel's plants and people thus receive the same quality of narrative attention. The novel's vegetal environment may appear to be mainly "below the level of experiential subjectivity," to apply Plotz's words,[57] but the experiential subjectivity of many of the novel's human characters is similarly unelaborated. This results in a narrative that portrays plants not only taking over the story's spaces but also contesting, and even usurping, the typical primacy of humans in the novel's discourse.

In addition to this displacement of humans by plants in the novel's future world and in the Time Traveller's narrative describing it, the novel's plants also compete with its humans by featuring in a plot that contrasts with the novel's human plot. Woloch notes that

> [t]he distribution of attention to different characters . . . always generates a rich double vision: we have two superimposed patterns or arrangements that will rarely overlap or coincide and will frequently, and to great effect, diverge significantly. On the one hand, we have the polycentric arrangement of the story, the plot that pulls in many different individuals, each of whom has a

> unique (perhaps unelaborated) experience within the story and a unique (perhaps submerged) perspective on the story. On the other hand, we have the single, delimited, finite, and particular shaping of this story into a fixed discourse, the actual discourse that arranges such characters in a specific way. (40–41)

Although Woloch's examination of how narratives can tell multiple stories, often diverging ones, is centered on the varying degrees to which the plot elaborates human characters' subjectivity, he argues later that "narratives themselves allow and solicit us to construct a story—a distributed pattern of attention—that is at odds with, or divergent from, the formed pattern of attention in the discourse" (41). In this case, that "pattern of attention" or "fixed discourse, the actual discourse," has been focused on the novel's human characters and the story of their devolution. Yet the novel also "solicit[s]" us to construct another story, one focused on its vegetal rather than human characters. And as Woloch notes is common for human minor characters, whose subjectivity is either "unelaborated" or "submerged" as the novel and its readers focus on the plot involving its major characters, the novel's apparently minor vegetal characters follow a plotline that "diverge[s] significantly" from that of its humans. While the novel's humans degenerate, its plants flourish. And although the novel's humans eventually disappear as the Time Traveller pursues his voyage farther into the future, the plants survive—and thrive. The Time Traveller notes "the same rich green that one sees on forest moss or on the lichen in caves" and notes the "algal slime" on a monster crab's claws during his initial stop farther in the future (145, 146). At his final stop, thirty million years into the future, the Time Traveller sees "livid green liverworts and lichens" and concludes from this "green slime" "that life was not extinct" (147). In an echoing of environmental competition, the novel's plant plot poses a rival narrative—and, tellingly, a more long-lasting one—to the one featuring its humans.

As well as persisting into the distant future in the novel's story, the plant plot also endures to the end of the narrative discourse. The moment when the Time Traveller pulls Weena's flowers out of his pocket and places them on the table before his dinner guests is the one break in his narration, an instant in which he draws both his listening and his reading audience's attention to the flowers, which occupy the narrative space that his pause leaves open. When the novel's frame narrator contemplates these "shrivelled" flowers at the story's end, he states that despite the degeneration of future humans, the flowers indicate that

"gratitude and a mutual tenderness still lived on in the breast of man" (156). This moment exemplifies the tension between the novel's human and plant plots, as the frame narrator only recognizes the former. He interprets the flowers from an anthropocentric point of view—either as objects that testify to the longevity of human qualities or as a substitute for Weena, the Eloi woman whom the Time Traveller wished to bring back with him.

But this ending image of the flowers could also yield a different meaning, as their persistent presence suggests that they might be seen as characters within their own plotline. Because the Time Traveller fails to return from his last journey, the flowers are all that remain of his tale. Woloch argues that "the strange significance of minor characters . . . resides largely in the ways that the character disappears, and in the tension or relief that results from this vanishing" (38). In this case, the narrative describes not just the "vanishing" of its purported major character but also the survival of its apparent minor characters. Though the frame narrator's anthropocentrism precludes his recognition of the novel's plant plotline, the Time Traveller's flowers nevertheless testify to its persistence.

Given the novel's anticipation that humans will become extinct as plants live on, the scene in which Weena's flowers take the place of the Time Traveller could be interpreted as exemplifying the novel's environmental expectations, in an important counterargument to nineteenth-century horticulturalists' efforts. *The Time Machine*'s future environment appears to realize horticulturalists' aspirations to thoroughly subjugate the vegetal world. But the achievement of this "perfect harmony" has wrought unintended consequences on the future world's humans, who have (according to the Time Traveller's theory) degenerated in response to this unstimulating natural environment. In other words, the novel suggests that the achievement of stingless nettles, and the ambition to create the subjugated natural environment that they represent, should be viewed skeptically. This is because—despite horticulturalists' triumphant rhetoric—plants are not the passive, malleable forms that breeders might desire but rather living, autonomous beings that often take unexpected paths. In *The Time Machine*, plants that have been made to fit into a horticultural plotline of subjugation break out of this plotline to offer one of their own, in which their continuance and steadfast spread contrast with human decline and eventual extinction. The ecological agency of plants is thus affirmed by a plotline that contrasts with, and ultimately outcompetes, the novel's human plot.

In its careful detailing of vegetal nature, Wells's novel resembles other nineteenth-century texts. Nearly every Victorian novel features a garden—from the rose plots that distract Sergeant Cuff in *The Moonstone*, to the old-fashioned Hall Farm garden that represents cultural conservatism in *Adam Bede*, to the herbaceous borders in many Trollope novels. But in these works, narrative attention to plants is often carefully circumscribed, as plants are apparently walled off from the novel's main (human) plot in a narrative echoing of an enclosed garden. *The Time Machine*, by contrast, offers an extreme version of an alternative environment: one in which the borders between gardens and wild nature are eliminated, placing plants and humans in the same space and on the same narrative plane.

Yet I would argue that while *The Time Machine*'s particular kind of attention to plants might make it seem like an outlier among Victorian texts, the model of ecological narration it exemplifies can be broadly applied. Using this competitive narrative model to read other texts might inspire interpretive questions different from those that undergird my analysis of *The Time Machine*. Could the interaction of human-nonhuman plotlines be classified as a symbiotic rather than competitive relationship, for instance, in which these plotlines reinforce and stimulate each other? I would also suggest that we ask how such plotlines interact or compete with aspects of contemporary culture, such as the horticultural aspirations for a human-engineered nature that Wells's novel implicitly critiques. These questions ask us to consider in what ways the relative agency of humans and nonhumans can be parsed through a competitive narrative system. In addition to realist models that stress the confluence and mutual entanglement between plants and humans, *The Time Machine* demonstrates that plants (and other nonhuman beings and objects) can also interrupt and contest the human-driven narratives which seem to dominate nineteenth-century texts, and which have long dominated their critical interpretation.

Notes

I wish to thank Ivan Kreilkamp, Monique Morgan, the editors of *Victorian Literature and Culture*, and the journal's anonymous reviewer for their generous and incisive comments on this piece.

1. Darwin, *Variation*, 1:391.

2. Wells, *The Time Machine*, 85. All subsequent references to this edition are noted parenthetically in the text.
3. See Haynes, *H. G Wells*, and Morton, *The Vital Science*, especially 100–112.
4. Wells, *Experiment in Autobiography*, 550.
5. Wells's personal background also likely nurtured his ability to describe specific natural environments. His father, grandfather, and great-grandfather were all gardeners; his great-grandfather was the head gardener at Lord de Lisle's Penshurst. See Mackenzie, *H. G. Wells*, 7. As a child, Wells watched as his father "drew and coloured pictures of various breeds of apple and pear and suchlike fruits, and . . . sought out and flattened and dried between sheets of blotting paper, a great number of specimen plants." See Wells, *Experiment in Autobiography*, 35.
6. Miller, "Dendrography and Ecological Realism," 711.
7. Cohen, "Arborealities," 6.
8. Miller, "Dendrography and Ecological Realism," 697.
9. Buell, *The Environmental Imagination*, 85.
10. Secord, "Darwin and the Breeders," 521.
11. Helmreich, *The English Garden*, 2.
12. Plant selection and breeding efforts were undertaken by a diverse swath of Victorian society, ranging from competitive gooseberry cultivation among Lancashire handloom weavers, to Darwin's experiments in cross-fertilization, to the hybridization of orchids by such commercial nurseries as Veitch & Sons. See Davies, *The Victorian Kitchen Garden*, 114; Darwin, *Variation*, passim; and Davies, *The Victorian Flower Garden*, 102.
13. Scourse, *The Victorians and Their Flowers*, 97.
14. Elliott, *Victorian Gardens*, 18.
15. Davies, *The Victorian Flower Garden*, 139–48.
16. British agriculture similarly experienced great changes throughout the nineteenth century, particularly through the development of commercial fertilizers and the selection and breeding of certain crops, especially wheat. See Russell, *English Farming*, 18–35, and Russell, *History of Agricultural Science*, 205–14. Like their horticulturalist peers, nineteenth-century agriculturalists thought "in terms of ascending spirals, of progress onwards and upwards for ever" (Russell, *English Farming*, 16). I focus here on horticultural rather than agricultural changes, as the flora the Time Traveller encounters were more often found in Victorian gardens than fields.

17. Lindley, Introduction, viii.
18. Darwin, *On the Origin of Species*, 42. All subsequent references to this edition are noted parenthetically in the text.
19. As I discuss below, horticulturalists relied on naturally occurring variations to practice artificial selection. In *The Variation of Animals and Plants under Domestication*, Darwin discusses some causes of this natural variation, such as bud variation (or "sporting"), in which a part of a plant spontaneously develops different characteristics from the rest of the plant. See 1: chap. 11. Darwin and his peers' lack of knowledge about genetics meant that their understanding of trait inheritance was speculative and incomplete. See Ritvo, Foreword, xi.
20. Using artificial selection to modify animal species is somewhat more time-intensive, depending on the animal. Darwin famously discusses artificial selection and pigeon breeding in the *Origin* (28–37) and later dedicated the *Variation* to the subject of animal and plant breeding, with a special focus on pigeons and ungulates. Ritvo describes the difficulties, and attendant prestige, surrounding competitive cattle breeding in *The Animal Estate* (45–81).
21. Burbidge, *Cultivated Plants*, 2.
22. Darwin, *Variation*, 326.
23. Darwin acknowledges this common belief—that "the principle of selection has been reduced to methodical practice for scarcely more than three-quarters of a century"—when he argues, against the apparent evidence of his peers' recently published "many treatises," that the practice has a much longer history (*Origin* 39). Some of the evidence Darwin cites, such as the "astonishing improvement in many florists' flowers, when the flowers of the present day are compared with drawings made only twenty or thirty years ago" (38), offers perhaps unintentional support to the idea that nineteenth-century horticultural efforts to remold plants were more successful than those of earlier times. Twentieth-century histories of Victorian horticulture trace Victorians' plant-breeding efforts to sixteenth-century Huguenot weavers, who brought their flower-breeding hobby with them to Britain when they fled religious persecution. See Scourse, *The Victorians and Their Flowers*, 22, and Carter, *The Victorian Garden*, 153.
24. Modern hybridization efforts began in Britain with the 1717 creation of the "Fairchild mule," Thomas Fairchild's cross between a sweet william and a carnation pink. See Herbert, "On Crosses," 335–80, for an overview of early British hybridization efforts.

25. Lindley, Introduction, ix.
26. Paul, "On the Grouping," 175.
27. Lindley, Introduction, viii.
28. "Discussion," 216.
29. Hibberd, "The Origin of the Florist's Dahlia," 6, 10. All subsequent references to this edition are noted parenthetically in the text.
30. Horner, "The Auricula," 109.
31. Darwin, *Variation*, 1:438.
32. Horner, "Auricula," 108.
33. Herbert, "On Crosses," 367, 372.
34. Even in early versions of what would later become *The Time Machine*, Wells describes the future environment along these lines. In the version serialized in the *National Observer* from March to June 1894, the Time Traveller refers to "systematic scientific earth culture," which has led to an environment in which "Gnats, flies, and midges were gone, all troublesome animals, and thistles and thorns. The fruits of this age had no seeds, and the roses no prickles." The Time Traveller concludes, "It must have been done by selective breeding." See Wells, "The Refinement of Humanity," 582.
35. Burbidge, "The Narcissus," 83.
36. Huxley, "Evolution and Ethics," 13, 9–10.
37. Merchant, *Reinventing Eden*, 75.
38. Drayton, *Nature's Government*, 4.
39. Hazlitt, *Gleanings in Old Garden Literature*, 4.
40. Huxley, "Prolegomena," 19.
41. Williams, *The Country and the City*, 9.
42. Scott, *Chaos and Cosmos*, 66.
43. Wells, "Letter to T. H. Huxley," 1:238.
44. Wagar describes *The Time Machine* as a "romance of devolution" (47); Page argues that it is "an evolutionary fantasy" (166); McLean shows how Wells "explore[s] the pessimistic implications of evolution for humanity" (13); MacDuffie suggests that the novel theorizes degeneration through biology and physics (225).
45. Wells, "Extinction," 624.
46. Kern, "Ecocriticism," 11.
47. Merchant, *Reinventing Eden*, 217.
48. Latour, "Agency," 15 (emphasis original).
49. Woloch, *The One vs. the Many*, 26. All subsequent references to this edition are noted parenthetically in the text.

50. In making this argument, I reverse one frequent reading of Darwin's *Origin*, advanced initially by Karl Marx: that the theory of natural selection echoes economic trends at the time. See Beer, *Darwin's Plots*, 121, and Browne, *Charles Darwin*, 54.
51. Wells, "The Chronic Argonauts," 188.
52. Wells, "The Chronic Argonauts," 189.
53. One could argue that flowers usurp the narrative's development as well, as the novel's human characters enter the scene only after its plants are described.
54. Iovino and Oppermann, "Material Ecocriticism," 83, emphasis original.
55. Plotz, "Speculative Naturalism," 34.
56. Plotz, "Speculative Naturalism," 33. Miller and Cohen make similar points about Hardy. See Miller, "Dendrography and Ecological Realism," 705–6; and Cohen, "Arborealities," 7–13.
57. Plotz, "Speculative Naturalism," 33.

Works Cited

Beer, Gillian. *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction*. Cambridge: Cambridge University Press, 2009.

Browne, Janet. *Charles Darwin: The Power of Place*. New York: Knopf, 2002.

Buell, Lawrence. *The Environmental Imagination: Thoreau, Nature Writing, and the Formation of American Culture*. Cambridge: Harvard University Press, 1995.

Burbidge, F. W. *Cultivated Plants: Their Propagation and Improvement*. Edinburgh: Blackwood, 1877.

———. "The Narcissus." *Journal of the Royal Horticultural Society* 11 (1889): 70–92.

Carter, Tom. *The Victorian Garden*. London: Cameron Books, 1984.

Cohen, William A. "Arborealities: The Tactile Ecology of Hardy's *Woodlanders*." *19: Interdisciplinary Studies in the Long Nineteenth Century* 19 (2014): 1–19.

Darwin, Charles. *On the Origin of Species by Means of Natural Selection or The Preservation of Favoured Races in the Struggle for Life*. Edited by William Bynum. 1859. New York: Penguin, 2009.

———. *The Variation of Animals and Plants Under Domestication*. 1868. Baltimore: Johns Hopkins University Press, 1998.

Davies, Jennifer. *The Victorian Flower Garden*. New York: Norton, 1991.

———. *The Victorian Kitchen Garden*. New York: Norton, 1987.

"Discussion." *Journal of the Royal Horticultural Society* 11 (1889): 216–17.

Drayton, Richard. *Nature's Government: Science, Imperial Britain, and the "Improvement" of the World*. New Haven: Yale University Press, 2000.

Elliott, Brent. *Victorian Gardens*. Portland: Timber, 1986.

Haynes, Roslynn D. *H. G Wells: Discoverer of the Future*. London: Macmillan, 1980.

Hazlitt, William Carew. *Gleanings in Old Garden Literature*. London: Elliot Stock, 1887.

Helmreich, Anne. *The English Garden and National Identity: The Competing Styles of Garden Design, 1870–1914*. Cambridge: Cambridge University Press, 2002.
Herbert, William. "On Crosses and Hybrid Intermixtures in Vegetables." In *Amaryllidaceae: Preceded by an Attempt to Arrange the Monocotyledonous Orders, and Followed by a Treatise on Cross-Bred Vegetables and Supplement*, 335–80. London: Ridgway, 1837.
Hibberd, Shirley. "The Origin of the Florist's Dahlia." *Journal of the Royal Horticultural Society* 13 (1891): 1–14.
Horner, F. D. "The Auricula." *Journal of the Royal Horticultural Society* 11 (1889): 107–15.
Huxley, Thomas H. "Evolution and Ethics. Prolegomena." In *Evolution and Ethics: And Other Essays*, 1–45. Vol. 9 of Collected Essays. London: Macmillan, 1903.
Iovino, Serenella, and Serpil Oppermann. "Material Ecocriticism: Materiality, Agency, and Models of Narrativity." *Ecozon@* 3, no. 1 (2012): 75–91.
Kern, Robert. "Ecocriticism: What Is It Good For?" *ISLE* 7, no. 1 (2000): 9–32.
Latour, Bruno. "Agency at the Time of the Anthropocene." *New Literary History* 45, no. 1 (2014): 1–18.
Lindley, John. Introduction to *A Guide to the Orchard and Kitchen Garden; or, An Account of the Most Valuable Fruit and Vegetables Cultivated in Great Britain*, by George Lindley, edited by John Lindley, vii–xxviii. London: Longman, 1831.
MacDuffie, Allen. *Victorian Literature, Energy, and the Ecological Imagination*. Cambridge: Cambridge University Press, 2014.
MacKenzie, Norman and Jeanne. *H. G. Wells: A Biography*. New York: Simon & Schuster, 1973.
McLean, Steven. *The Early Fiction of H. G. Wells: Fantasies of Science*. Houndmills: Palgrave, 2009.
Merchant, Carolyn. *Reinventing Eden: The Fate of Nature in Western Culture*. New York: Routledge, 2003.
Miller, Elizabeth Carolyn. "Dendrography and Ecological Realism." *Victorian Studies* 58, no. 4 (2016): 696–718.
Morton, Peter. *The Vital Science: Biology and the Literary Imagination, 1860–1900*. London: Allen & Unwin, 1984.
Page, Michael R. *The Literary Imagination from Erasmus Darwin to H. G. Wells: Science, Evolution, and Ecology*. Burlington: Ashgate, 2012.
Paul, William. "On the Grouping of the Garden Varieties of Roses." *Journal of the Royal Horticultural Society* 11 (1889): 175–85.
Plotz, John. "Speculative Naturalism and the Problem of Scale: Richard Jefferies's *After London*, after Darwin." *Modern Language Quarterly* 76, no. 1 (2015): 31–56.
Ritvo, Harriet. *The Animal Estate: The English and Other Creatures in the Victorian Age*. Cambridge, Mass.: Harvard University Press, 1987.
———. Foreword to *The Variation of Animals and Plants under Domestication*, by Charles Darwin, v–xiii. Baltimore: Johns Hopkins University Press, 1998.
Russell, E. John Sir. *English Farming*. London: William Collins, 1941.
———. *A History of Agricultural Science in Great Britain*. London: George Allen & Unwin, 1966.

Scott, Heidi C. M. *Chaos and Cosmos: Literary Roots of Modern Ecology in the British Nineteenth Century*. University Park: Pennsylvania State University Press, 2014.
Scourse, Nicolette. *The Victorians and Their Flowers*. Portland: Timber Press, 1983.
Secord, James A. "Darwin and the Breeders: A Social History." In *The Darwinian Heritage*, edited by David Kohn, 519–42. Princeton: Princeton University Press, 1985.
Voskuil, Lynn. "The Victorian Novel and Horticulture." In *The Oxford Handbook of the Victorian Novel*, edited by Lisa Rodensky, 549–68. Oxford: Oxford University Press, 2013.
Wagar, W. Warren. *H. G. Wells: Traversing Time*. Middletown: Wesleyan University Press, 2004.
Wells, H. G. "The Chronic Argonauts." Appendix to *The Early H. G. Wells: A Study of the Scientific Romances*, by Bernard Bergonzi, 187–214. Toronto: University of Toronto Press, 1961.
———. *Experiment in Autobiography: Discoveries and Conclusions of a Very Ordinary Brain (Since 1866)*. New York: Macmillan, 1934.
———. "Extinction." *Chambers's Journal*, Sept. 30, 1893, 623–24.
———. "Letter to T. H. Huxley." May 1895. In *The Correspondence of H. G. Wells*, edited by David C. Smith, 1:238. London: Pickering, 1998.
———. "The Refinement of Humanity." *National Observer*, Apr. 21, 1894, 581–82.
———. *The Time Machine: An Invention*. Edited by Nicholas Ruddick. 1895. Peterborough: Broadview, 2001.
Williams, Raymond. *The Country and the City*. Oxford: Oxford University Press, 1973.
Woloch, Alex. *The One vs. the Many: Minor Characters and the Space of the Protagonist in the Novel*. Princeton: Princeton University Press, 2003.