An Empire of Red Weed: Environmental Infrastructure in H. G. Wells's *The War of the Worlds*

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IN the opening chapter of H. G. Wells's novel *The War of the Worlds* (1898), the narrator speculates that the Martians seek to colonize Earth because their own planet is in a state of "exhaustion," marked by frigid temperatures, an atmosphere low in oxygen, and "oceans [that] have shrunk until they cover but a third of its surface." Water is either a scarce or an overabundant resource on Mars, as when the seasons change, "huge snow caps gather and melt about either pole and periodically inundate its temperate zones." The Earth, by contrast, appears to be an idyllic "warmer planet, green with vegetation and grey with water, with a cloudy atmosphere eloquent of fertility" and with an equable climate.[1] These contrasting visions of Mars and Earth frame the Martians' colonizing mission in environmental and infrastructural terms. Earth (and specifically southern England, which the Martians attack) is rendered attractive by its predictable planetary systems and its water-rich local environments. These environmental characteristics act as infrastructures that enable life to thrive.

Theorists of infrastructure often describe the challenge of simply *seeing* infrastructure, which acts as a "hidden substrate," as Keller Easterling puts it,[2] until it collapses in some spectacular way.[3] A similar pattern might be registered in discussions of the life-sustaining natural environment, which may seem invisible until its deterioration becomes impossible to ignore. But although critics have recently elaborated a more capacious sense of infrastructure than "the popular understanding of infrastructure as hardware,"[4] their examples of infrastructure remain largely limited to the built environment, affirming the assumption that infrastructure is engineered by and benefits humans.[5]

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I would like to counter what one might term infrastructure studies' anthropocentric bias by treating the natural environment as a form of life-sustaining infrastructure that is shaped and reshaped by humans and nonhumans alike. The Unist'ot'en activist Freda Huson has recently asserted that "for us, our critical infrastructure is the clean drinking water, and the very water that the salmon spawn in, and they go back downstream and four years, come back. That salmon is . . . one of our critical infrastructures."[6] Winona LaDuke and Deborah Cowen note that Huson defines infrastructure as that which is "life-giving and capable of sustaining not only the body, but the spirit and law as well."[7] In contrast to the Canadian government's rhetoric of "critical infrastructure" used to justify the construction of fossil-fuel-transporting pipelines, Huson conceives the local ecosystem, with its bound-together parts of salmon, water, and people, as infrastructure. Huson stresses ecological interconnection. The salmon are infrastructure and also help maintain the broader environmental infrastructure, as their deaths following spawning enrich the up-river ecosystem, including the trees whose roots filter the water on which the salmon depend. Huson could be said to "tak[e] the 'infra-' seriously," as she traces "what lies beneath or behind" or serves as "the infrastructure of infrastructure"—the natural environment, shaped by such nonhuman beings as salmon or trees, that allows a diverse array of lives to thrive.[8]

Thinking of environments in infrastructural terms should come naturally for us in this time of climate change. The at first gradual and now hastening deterioration of Earth systems has drawn attention to the vulnerability of our environmental infrastructures, and to the migrations and extinctions of species that rely on them—including, potentially, ourselves. In *The War of the Worlds*, Wells reflects on this vulnerability through the invasive plant species red weed, which doubles the British career of the introduced species Canadian waterweed, *Elodea canadensis*. Red weed and *Elodea* similarly re-engineer the environments they encounter, transforming ecosystems and human-built infrastructures alike. Like *Elodea*, red weed simultaneously reveals how the environment of southern England acts as an infrastructure and demonstrates this environment's vulnerability to nonhuman engineering, challenging anthropocentric assumptions about what infrastructure is and who or what shapes it.

Elodea's spread through the British countryside inspired British commentators to reckon with the ways in which imperial plant movement threatened the integrity of environments, contributing, as Lynn Voskuil puts it, to an "at least incipient awareness that exotic plants could pose

an ecological problem" in the late nineteenth century.[9] In contrast to real-life examples of introduced species, though, red weed leaves no lasting effects on the novel's natural environment, with the novel pointedly refusing to extend its imperial critique to the movement of species that Alfred W. Crosby has termed "ecological imperialism." *The War of the Worlds*' consideration of how environments act as infrastructures, and of how nonhumans might reshape infrastructures, is thus, like the Martians' attack, both spectacularly advanced and abruptly curtailed, with the local British environment—tamed and dominated by humans—restored, unbelievably, by the novel's end.

Britain under *Elodea*

Wells wrote *The War of the Worlds* at a time of significant species movement. While human travelers have long carried animals and plants with them, the eighteenth and nineteenth centuries witnessed an unprecedented "diaspora of nature."[10] Expanding European empires opened new territory for exploitation, while technological changes such as the development of the terrarium and steam-powered ships enabled the movement of species across great distances.[11] The expansion of empire and migration of species went hand in hand: Crosby argues that "the success of European imperialism has a biological, an ecological component,"[12] while Richard Drayton contends that "British Imperialism . . . [was] a campaign to extend an ecological regime" in which "the state might manage nature."[13] The British state managed nature in part through deliberate species introductions, especially facilitated by the Royal Botanic Gardens at Kew, which "became a depot for the interchange of plants throughout the Empire."[14] Kew horticulturalists oversaw the movements of plants among the diverse climates and growing conditions in the British Empire—Chinese tea plants were taught to flourish in similar climates in India, for instance,[15] while South American rubber trees were introduced to southeast Asia.[16] Some of these introductions were short-lived, but the consequences of others have endured even as Britain's imperial power waned; Crosby notes, for instance, that "the sun never sets on the empire of the [European-originating] dandelion."[17] The goals of ecological imperialism were primarily economic and nationalist. But as Voskuil argues in her work on Robert Fortune, who masterminded the introduction of Chinese tea plants to India, species migration also "exhibits an emerging awareness of how manipulating parallel ecosystems could improve living

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conditions in various parts of the world,"[18] or an awareness that environments might be treated as infrastructures that could be exploited to support nonindigenous forms of life.

The War of the Worlds' oft-remarked parallels between Martian and European imperialism extend to imperialism's environmental projects,[19] with the novel surveying different models of species introduction. In the book's prologue, Wells's narrator argues that before readers "judge" the Martians "too harshly," they should remember the "ruthless and utter destruction our own species has wrought." The narrator cites "the vanished bison and the dodo" as well as the plight of "inferior races" who, he argues, were similarly "swept out of existence in a war of extermination waged by European immigrants" (9). Species extinction is implicitly paired here with species introduction, as white settlers seized the land formerly occupied by "inferior races," and European-originating poultry and cattle replaced dodos and bison. While Wells's novel describes the "ruthless" replacement of species wrought by British colonists overseas, he also documents an alternative model of species introduction in southern England. Before the advent of red weed, Wells's unnamed narrator moves through a landscape already diversified by introduced species, from the "vallyble" orchids that "a shriveled old fellow" refuses to abandon, to the gladiolus bulbs (native to the Mediterranean, Asia, and parts of Africa) that the narrator discovers in an abandoned garden (60, 145). In contrast to the re-engineered environments of overseas colonies, the British countryside is a gardenscape of naturalized species living harmoniously alongside native British plants. Wells emphasizes how these ornamental plants have been quietly absorbed into the British environment, but this account belies a history of less innocuous species introductions to Britain. Matthew K. Chew has argued that red weed is based on the aggressive career of an accidental introduction, Canadian waterweed or *Elodea canadensis*, which proliferated in Britain's waterways in the mid-nineteenth century.[20] *Elodea* overwhelmed and reshaped watery environments, visiting on the British countryside the "utter destruction" that British settlers wrought on environments abroad.

Elodea (sometimes referred to in nineteenth-century texts as *Anarchis alsinastrum*, following botanist C. C. Babington) was likely first spotted in Britain in the 1830s. While some botanists, such as the eminent Babington, argued that the plant was native to Britain, by the late nineteenth century a consensus emerged that the plant "had been introduced, probably from America" in a shipment of wood rafted down North American rivers.[21] *Elodea* flourished in Britain's temperate climate

and abundant waterways. It followed the trajectory of many introduced plants: brought into the country either deliberately or accidentally by ship traffic, seeds and plants then used Britain's waterways to move themselves around the country.[22] By the mid-nineteenth century *Elodea* was widespread, "choking our ponds, rivers, and canals," as one contemporary wrote.[23] The solicitor and amateur botanist William Marshall described how the plant dominated ecosystems: "its powers of increase are prodigious," as "[t]he stems are *very brittle*, so that whenever the plant is disturbed, fragments are broken off . . . [and] every fragment is capable of becoming an independent plant, producing roots and stems, and extending itself indefinitely."[24] Marshall traced *Elodea*'s path through Britain's waterways, from its origin at Dunse Castle through the rivers Cam, Ouse, and Trent, and the Oxford and Grand Union canals (4–11). The plant could spread rapidly and might soon appear in all of Britain's waterways, as an 1853 piece in *Chambers's Edinburgh Journal* warned:

> A few detached stems of this erratic pest could . . . enter the Severn through the Avon, the Thames through the Cherwell, the Nene above Northampton, the Ouse at Buckingham, the Welland at Market Harborough, the Trent by the Anker, Tame, and Soar; from the Soar the Witham could be entered by the Grantham Canal; and from thence by Lincoln, the important watercourses that drain the fens of North Lincolnshire could be impregnated. Still more: when the weed had travelled as far down the Trent as its junction with the Humber, the numerous vessels ascending the great valley, containing 4000 square miles, drained by the Yorkshire Ouse, would carry it up with them, and so inoculate that large river and its many tributaries.[25]

This nervous tracking of *Elodea*'s potential spread reveals the interconnectedness, and vulnerability, of Britain's watery environments—especially in southern England, where red weed's expansion would soon fictively parallel *Elodea*'s. Britain's waterways had been "improved" and extended from the early modern period until the mid-nineteenth century, when railroads began to overtake water routes in transporting goods and people.[26] *Elodea* took advantage of this newly vast, easily navigable network of human-engineered locks and canals as well as rivers, creeks, streams, and fens. In 1850 it "almost blocked" the river Trent; by 1855 it had blocked "most navigable sections of the river [Ouse]."[27] Marshall notes "universal complaints" about "the obstructed state of the River Cam," and chronicles how "[t]he Railway *Dock* at Ely, became so choked with the weed that boats could not enter until several tons of it had been lifted out" (9; emphasis in original). Plants' growth is

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typically "seen as purposeless," as Michael Marder notes,[28] but *Elodea*'s spread through the British environment was frequently characterized as purposeful: the plant "enter[ed]," "impregnate[d]," and "inoculat[ed]" Britain's waterways in a confused series of bodily invasion metaphors that render these infrastructures, and their vulnerability, newly visible.

Elodea not only exploited Britain's water infrastructures but also transformed them. Marshall describes how the plant was "choking up the mouths of docks, sluices, and narrow watercourses, and . . . impeding both navigation and drainage" (8–9). He expresses particular concern about its effects on drains used to make the fenlands productive for agriculture: the plant's unusual weight meant that "when cut, (instead of rising to the surface and floating down to sea, like other weeds) it sinks to the bottom . . . which is likely to make it injurious to drainage" (3). Marshall warned that "if [*Elodea*] should continue to increase in anything like the same ratio as it has done, the upper parts of our rivers will no longer be able to pass their waters to sea," with this stagnant water flooding the areas around Britain's inland waterways (9). Marshall's prediction was soon fulfilled: an article summarizing his work noted that "[a]n experienced engineer and drainage official has calculated that, last year, [*Elodea*] impeded drainage in the fenny parts of Cambridge and Huntingdonshire equivalent to a rise of one foot."[29] Human-engineered infrastructures, such as the drains used in the fens, manipulate the environment into meeting human needs. But *Elodea*'s spread through the British countryside showed that it, too, was capable of infrastructural engineering to create a still-more-expanded habitat for itself.

Elodea's manipulation of British waterways made these environmental infrastructures newly visible by their deterioration. The plant was dangerous to swimmers and rowers, who could become entangled in its fronds, and "[i]n many places, fishermen have discontinued setting long lines, because the 'new weed' either carries them away bodily or strips them of baits and fish."[30] As a review of Marshall's pamphlet in the *Athenaeum* put it: "Our rivers are taken possession of, their inhabitants have been strangled or poisoned, and we are threatened with an entire blockade of our ports and arrest of our navigation, by a water-weed from the New World." The review concluded by "call[ing] the attention of the Government and the Peace Society to . . . this novel mode of taking possession of a country."[31] *Elodea*'s expansion was cast as a form of reverse-colonization, with the plant's spread echoing British settlers' re-engineering of environments around the world. As Britons negotiated obstructed waterways, got tangled in *Elodea* fronds, and lost fishing lures

to the spreading plant, they were forced to reckon with the fact that their waterways, both those deliberately engineered as infrastructure, such as canals, and those newly recognized as infrastructures, such as rivers and streams, could be used and transformed by others besides themselves. They also recognized *Elodea*'s disruptive power as extending beyond themselves. The *Athenaeum* review is melodramatic in its portrayal of the plant's dominance, but it also seems to expresses genuine concern for the aquatic flora and fauna "strangled or poisoned" by the plant. Acting like British colonists overseas but seen as a rebellious invader, *Elodea*'s spread through the British environment simultaneously revealed how Britain's waters functioned as infrastructure, how that infrastructure was vulnerable to reshaping by nonhumans, and how humans and other indigenes could, in turn, be forced to reckon with their own helplessness in the face of a changed environment.

The Earth under Red Weed

As a trained scientist who studied under T. H. Huxley and wrote a biology textbook before turning to fiction, H. G. Wells was prepared to exploit current scientific discussions about species movement. Red weed is one among a number of red-colored plants that the Martians "intentionally or accidentally" introduce to Earth (128). While most of these Martian flora fail to naturalize,[32] red weed transforms into what would now be called an invasive species.[33] Moving outward from the pits created by the Martians' cylinders, red weed rapidly expands. It tints the landscape, at times overwhelming the narrator's perception so that he feels, in his course through the red-weed-bestrewn environment, as though he is "walking through an avenue of gigantic blood-drops" (145). Red weed's progress through the environment is swift. Before the narrator enters a hiding place from the Martians, he witnessed early signs of its arrival in the country: he describes "an unaccountable redness" glimpsed alongside a river and catches sight of "a number of red masses, some many feet across" that are floating down a stream (116, 117). When he leaves his hiding place, he finds red weed "broadcast throughout the country," forming a "carmine fringe" to a once-familiar landscape, and rendering it "weird and lurid, of another planet" (128, 144). Like *Elodea* or the European colonists to whom the Martians are compared, red weed has "tak[en] possession of a country" and is reshaping it for its own ends.

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Echoing the progress of *Elodea*, red weed exploits British waterways to move itself around. In addition to first spotting red weed alongside a river (116), the narrator continually references water in his observations of it: he spies red weed through the links in a bridge over a river, states that "the Wandle, the Mole, every little stream, was a heaped mass of red weed," describes how a river can barely be perceived beneath the "bubbly mass of red weed" growing in it, and notes that he found the plant "wherever there was a stream of water" (117, 175, 160, 128). He specifically theorizes how red weed exploits waterways in its expansion:

> Directly this extraordinary growth encountered water, it straightway became gigantic and of unparalleled fecundity. Its seeds were simply poured down into the water of the Wey and Thames, and its swiftly growing and Titanic water-fronds speedily choked both those rivers. At Putney, as I afterwards saw, the bridge was almost lost in a tangle of this weed, and at Richmond, too, the Thames waters poured in a broad and shallow stream across the meadows of Hampton and Twickenham. As the waters spread the weed followed them, until the ruined villas of the Thames Valley were for a time lost in this red swamp. (145)

Like *Elodea*, which flooded the areas around rivers and so created more expansive habitat for itself, red weed fills streams and so encourages their flooding, which remakes former meadows into suitable sites for red weed's expansion. Its spread further echoes *Elodea* in usurping water infrastructures so thoroughly that they are no longer usable by humans. Early in their campaign, the Martians had apparently targeted human-engineered infrastructure: they "exploded any stores of power they came upon, cut every telegraph, and wrecked the railways here and there," "hamstringing" humans' attempts to flee or communicate news of the Martians' rampage (105). While the Martians do not target water and water-adjacent infrastructure directly, red weed does. It encompasses a bridge and so renders it impassable by humans, and it turns a neighborhood of low-lying roads into a swamp. As the profusion of red weed pushes the Thames to overflow its banks, it similarly makes what were once meadows unnavigable: the narrator finds the flood too deep for him to ford, and he is forced to turn back from his intended path (146). Redirecting waters, red weed demonstrates humans' reliance on submerged environmental infrastructure.

As red weed spreads through England, it not only reshapes the environment by flooding landscapes and creating new habitat for itself, but also by displacing native flora or "gain[ing] . . . footing in competition with terrestrial forms" (128). The plant moves from the Martian

cylinders' landing sites to water and then penetrates nearly every kind of ecosystem in southern Britain. The narrator witnesses how surviving forest trees' "still living stems" are "scaled" by a "network of red thread"; red weed "swarm[s] up the trees" like a tropical liana (160). Red weed also, like many weeds, takes advantage of disturbed ground and "unoccupied" space (143). Roofless houses provide habitat for the "tumultuous" and "exuberan[t]" red weed (143, 145). The narrator describes a "mound of smashed brickwork, clay, and gravel," destruction wrought by the Martians' war machines, "over which spread a multitude of red cactus-shaped plants, knee-high, without a solitary terrestrial growth to dispute their footing." Most weeds are defined as weeds by their adaptability; they are, as Anna Tsing notes, both "disturbance-loving and disturbance-making."[34] But this adaptability usually has limits. Richard Mabey argues that "the ultimate plant pest—some scrambling, fast-growing, leaf-smothering, all-year-round, all-habitat, all-weather Devil's snare—hasn't emerged in reality" and "is most unlikely to."[35] Terrestrial plants, even weedy "botanical thugs,"[36] are limited by the environmental conditions in which they can survive. But red weed is not. In addition to adapting to a range of habitats with different environmental constraints—red weed is an aquatic plant that also grows in soil, and it thrives equally in the shade of forest trees and in sunny roofless houses—red weed also seems to represent weeds' adaptability in its shifting form. It is described both as succulent and cactuslike and as composed of (water-loving) fern-like "fronds" (145, 146, 163); it is capable both of twining, ropelike, and of growing in bushy thickets, so that the narrator pushes through it, "knee-deep, and sometimes neck-deep" (144). Red weed defies the constraints of vegetal form as seen on Earth; it is, as Christina Alt notes, "a very strange plant indeed . . . a deliberate fictional hybrid."[37] This extraordinary plasticity and adaptability guarantee its invasiveness, as it exploits and displaces native flora so thoroughly that it renders a once-green landscape a "sullen red": not only unnavigable by humans but also unrecognizable (175).

Like *Elodea*, red weed's dominance renders the environment unexploitable by humans. In fact, red weed has the potential to disrupt humans' "experiences of everyday life and . . . expectations of the future" just as much, or more, than the Martians' heat rays and black smoke.[38] As red weed's transformation of southern Britain indicates, it could re-engineer the surface of the Earth into an aqueous infrastructure suitable to itself but hostile to many other forms of life. For instance, the impossibility of practicing agriculture and horticulture in a Martian-

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and red-weed-dominated environment is implicit throughout the narrator's description of his flight and hiding from the Martians, as he watches fields and gardens fill with red weed and hears accounts of people "starving in heaps" (153). An artilleryman the narrator meets on the outskirts of London even suggests that the Martians will use humans' experience of "empty stomachs" to transform people into a captive food source; no longer the growers of food in a landscape shaped to support them, humans will become "eatable ants" (155, 153). Acknowledging his own vulnerability in a space no longer engineered for his survival, the narrator explores the possibility of exchanging accustomed food sources for red weed. He describes the plant's appearance as "between butcher's meat and pickled cabbage," and at one point he "gnawed some fronds of red weed; but they were watery, and had a sickly, metallic taste" (175, 146). Even if the Martians were to withdraw at this point in the novel, leaving humans the safety and leisure needed to reestablish agriculture, red weed's far-reaching conquest of the novel's spaces and water resources ("the water mains and drains are empty," the artilleryman remarks) would make this task near-impossible (153), with red weed's dominance arguably offering an even more significant threat to human survival than the Martians. In its depiction of human vulnerability to Martian attack, then, the novel also shows humans' vulnerability to Martian plants' environmental re-engineering. Red weed's spread across the landscape reveals how the British environment acts, or used to act, as an infrastructure for sustaining life, with this infrastructure only made visible to the novel's human characters by its collapse.

The Long Life of *Elodea* and the Short Life of Red Weed

Despite the alignment between *Elodea*'s trajectory in Britain and red weed's initial plotline through Wells's novel, the careers of these plants ultimately diverge. Looking out over the reddened landscape, the narrator of *The War of the Worlds* feels the "first inkling of a thing that presently grew quite clear in my mind . . . a sense of dethronement, a persuasion that I was no longer a master, but an animal among the animals, under the Martian heel. With us it would be as with them, to lurk and watch, to run and hide; the fear and empire of man had passed away," replaced by the empire of the Martians and red weed (144). Such passages have inspired critics to stress the novel's critique of anthropocentrism: Alt argues that the novel shows how "evolutionary ideas in the Victorian period stripped humans of their sense of special status,"[39]

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while Robert Crossley similarly contends that the novel satirizes the "anthropocentric fallacy" that "puts a human face on all intelligence, [and] assumes that only those beings created in our image have status equivalent to ours."[40] But the novel soon retreats from this imagined loss of humans' "empire," leaving incomplete the novel's anthropocentric critique. As he walks through deserted London, the narrator realizes that the Martians are dead, felled by Earth's microbes. Red weed is similarly soon destroyed, "succumb[ing] almost as quickly as it had spread":

> A cankering disease, due, it is believed, to the action of certain bacteria, presently seized upon it. Now, by the action of natural selection, all terrestrial plants have acquired a resisting power against bacterial diseases—they never succumb without a severe struggle, but the red weed rotted like a thing already dead. The fronds became bleached, and then shriveled and brittle. They broke off at the least touch, and the waters that had stimulated their early growth carried their last vestiges out to sea. (145)

Red weed's disappearance, enabled by the network of waterways that also enabled its dispersal, is so complete that the narrator, writing some years after the Martian invasion, is able to say that "few people have seen it growing." With red weed's removal, the British landscape is rapidly restored. Terrestrial plants retake the spaces once occupied by red weed, and Britain's watery environments return to their former state, so that in the novel's closing paragraph the narrator reflects on an environment marked by "flower-beds on the hill" and a "dim and blue" horizon, rather than red weed's "blood-red" growth (128).

Red weed's abrupt disappearance—a "biological *deus ex machina*," as Patricia Kerslake has called it—distinguishes it from *Elodea* and other introduced species.[41] In the nineteenth century Marshall noted *Elodea*'s prevalence and concluded that its elimination was likely impossible; he argues that the British should focus their efforts on subjugation, or "keep[ing] it down" (16). To this end, he quotes the physician and botanist George Johnston, one of the first discoverers of the plant in Britain, who argues that because "the weed is *altering the character* of the Whiteadder [River]," it "will require before long to be dealt with as we have dealt with savages in some places" (12; emphasis in original). Picking up on the reverse-colonization rhetoric that cast *Elodea* as an American invader, Johnston describes *Elodea* as a colonized subject rebelling against the British imperium. He insists on an aggressive response—one that would, it seems, crush the plant's resistance to British authority over water infrastructure, restoring the human-dominated "character" of

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British nature. But despite these manifold attempts to control it, *Elodea* continued to follow its own path through the British landscape, with contemporary writers forced to acknowledge that "it has fairly established itself amongst us, *never to be eradicated*" (16; emphasis in original). Grounding his analysis in a resurgence of *Elodea* (albeit a different variety, *Elodea nuttallii*) in Britain in the 1970s, D. A. Simpson describes how

> During the 1880s it became apparent that a cycle of colonization was taking place. The plant would become established at a locality and over a period of three to four years it would rapidly increase, eventually reaching pest proportions and excluding most, if not all, other macrophytes. Maximum numbers would be maintained for a further three to ten years followed by a gradual decline over a seven to fifteen year period. A much smaller, relict population would sometimes remain, or the plant would disappear altogether, possibly returning some years later.[42]

Like his nineteenth-century predecessors who lamented *Elodea*'s mode of "taking possession of a country," Simpson recapitulates the language of empire to describe *Elodea*'s "coloniz[ing]" path through Britain. And human efforts to control this "coloni[st]" are largely ineffective: *Elodea*'s population seems to ebb and flow for unknown reasons. As Victorians' accounts and *Elodea*'s 1970s reappearance indicate, *Elodea*, like many other nineteenth-century species introductions, never fully disappeared.[43] Rather, *Elodea* demonstrated the limits both of human foresight and of humans' environmental engineering, arguably representing a greater challenge to anthropocentrism than Wells's novel, with its foreshortened fates of Martians and red weed, ever could.

Elodea's disruptive course through Britain prompted a reckoning, at least among some nineteenth-century commentators, with the persistent, unforeseen environmental consequences, both at home and abroad, of imperial plant movement. Contemporary responses situated *Elodea* in the context of ecological imperialism: an 1864 piece likens *Elodea* to invasive British-introduced watercress in New Zealand,[44] while Marshall analogizes the plant to other notorious species introductions, including "the imported European horses and oxen in the South American Pampas, or Capt. Cook's pigs in New Zealand, or the Norway rat in our own farm yards" (16). Some writers reasoned from the example of *Elodea* and similar introduced species that greater caution should be exercised in species introductions. One writer concludes that introducing a new species "cannot but have a material influence on the character and local distribution of the members of the organic world"; if readers are

considering "transferring animal and vegetable life from one region to another," he urges them to use "this power . . . with a judgment and caution in proportion to its magnitude and importance."[45] Critics have tended to read *The War of the Worlds* as critical of British imperialism.[46] But red weed's demise, which both defies the trajectory of other introduced species and ignores this emerging environmentalist discourse, enables Wells to evade, rather than engage, the long-unfolding consequences of British ecological imperialism.[47] If red weed had remained an overwhelming environmental presence in the wake of the Martian invasion, the narrator would have been forced to grapple with vegetation that renders him powerless, underresourced, and affectively homeless in his home—in other words, in the state of many colonized peoples forced to navigate the "utter destruction" wrought by British settlers' species introductions.[48]

The novel neglects these emerging critiques of ecological imperialism in favor of an alternative explanation for red weed's vanishing: natural selection, with red weed's disappearance attesting to the evolutionary superiority of terrestrial (and specifically British) species over introduced Martian plants (145). Wells seems to have adhered to an understanding of empire inflected by natural selection, in which lesser forms (such as red weed, or the dodo, bison, and "inferior races" referenced at the novel's beginning) were extinguished and replaced by superior forms. Four years after the publication of *The War of the Worlds*, Wells predicted a similar natural-selection-induced fate for the colonized peoples of the British Empire in the future's scientist-ruled world-state. In his *Anticipations of the Reaction of Mechanical and Scientific Progress upon Human Life and Thought* (1902), Wells argues that if "they fail to develop sane, vigorous, and distinctive personalities for the great world of the future," then "it is their portion to die out and disappear. . . . The whole tenor and meaning of the world, as I see it, is that they have to go."[49] This "hyperrationalism about who will and will not have a place in the perfected world," as Sarah Cole puts it, applies equally to people and plants.[50] As in his expulsion of red weed from *The War of the Worlds,* Wells's imagination of potential environmental futures is here characterized by the abrupt endings of extinction, rather than the complex, long-unfolding consequences of species introduction described by his peers.

Wells' socio-scientific and quasi-genocidal belief in natural selection, which justifies the disappearance of Tasmanians and red weed but ignores the ecological lessons of *Elodea*, affirms the British Empire's re-engineering of environments around the world. This is, Wells implies,

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an appropriate form of natural selection for the approaching world-state, in which not only world governments but also world ecosystems will be "merg[ed]" and "smear[ed] . . . into each other,"[51] with superior forms rising to the top. Commentators on *Elodea*'s spread described the plant as a hostile force infiltrating Britain, even as *Elodea*'s expropriation and re-engineering of its environment paralleled the actions of British colonists. Wells echoes and then erases these reverse-colonization anxieties. In a novel which assumes that southern England—the site of Kew and British government—is a plausible synecdoche for "the world," Wells insists on British nature's unique resilience and implies its evolutionary superiority in the global, and galactic, landscape. But Wells's reinstatement of an intact British countryside at the end of the novel is, I argue, less a return to normalcy than another fantastical evolution of the plot. Erasing ecological imperialism's consequences in a novel that otherwise parallels an infamous example of species introduction, Wells situates the British environment, strengthened by natural selection, as immune from the environmental chaos that British imperialists unleashed around the world. With red weed's disappearance, Wells dismisses the idea that anything, or anyone, could truly challenge Britons' control over environmental infrastructures, both at home and abroad.

Returning to Earth, Returning to Infrastructure

Fiction about other planets offers particular opportunities for recognizing how environments act as infrastructures for sustaining life. The challenge of imagining how life either survives or fails to thrive (in the case of Wells's Mars) in another world can spur contemplation of what makes this world habitable—and, conversely, what could render it uninhabitable. In short pieces written both before and after *The War of the Worlds*, Wells extrapolated that Mars's ecospheric conditions could act infrastructurally. In an 1896 piece on "Intelligence on Mars," for instance, he describes how the planet's "chemical" and "physical" characteristics so closely resemble Earth that "there is no great difficulty in supposing that [life] came into existence on Mars."[52] Similarly, in a 1908 article, he theorizes that in Mars's comparatively thin atmosphere, plants would be "big, slender, stalky, lax-textured," while animals would be "laxer and flimsier and either larger or else slenderer than earthly types."[53] The form of the planet's "ruling inhabitants" would develop in response to that of animals, and animals' form would be regulated by that of plants, which in turn would be shaped by the planet's

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conditions, in an ever-receding perspective on what lies "beneath or behind" the planet's life,[54] shaping what forms might evolve and how they might endure. Wells's short pieces about Mars fit into a long tradition: as Robert Markley has argued, science fiction about Mars has long been "obsessed with ecological issues," and "insistently foreground[s] the problems of survival . . . in a fragile or exhausted environment." Mars "has been seen as "a harbinger of the ecological fate of the Earth."[55] *The War of the Worlds* picks up on this anxiety, as it, too, queries what form an environment must take to support life.

In our own world, ecosystems are transforming under the pressure of climate change, with scientists chronicling "mounting evidence for the pervasive and substantial impacts of a climate-driven redistribution of Earth's species."[56] These local migrations foreshadow the more profound global dislocations yet to come in a new era of climate- as well as human-propelled species migrations. Wells's novel, written at another peak moment of global species movement, both imagines how an introduced species might reshape an environment and ignores the possibility of long-term ecological consequences following from species introduction, at least within the novel's setting in southern England. In red weed's reshaping of watery environments, Wells's novel develops an early understanding of environments as infrastructures for sustaining life. But his novel also fails to fully recognize, or grapple with, all environments' vulnerability—even as, then and now, environmental infrastructures have been, and are being, rendered visible by their collapse.

Notes

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1. Wells, *The War of the Worlds*, 8. All subsequent references to this edition are noted parenthetically in the text.
2. Easterling, *Extrastatecraft,* 11.
3. See Hurley and Insko; Robbins; and Rubenstein, Robbins, and Beal. However, Kopec, Larkin, and Yeager all critique assumptions of infrastructure's invisibility.

4. Carse, "Nature," 150. See Hurley and Insko, "Introduction," and Anand, Gupta, and Appel, "Introduction."
5. Hurley and Insko cite hydroelectric dams and oil pipelines, while Anand, Gupta, and Appel list "roads and water pipes, electricity lines and ports, oil pipelines and sewage systems" as examples ("Introduction," 3). Similarly, proponents of "natural infrastructure" stress how we might design or extend environmental forms to serve our needs; see Carse and McDonald.
6. Qtd. in Spice, "Fighting Invasive Infrastructures," 40–41.
7. LaDuke and Cowen, "Beyond Wiindigo Infrastructure," 252.
8. Levine, "Infrastructuralism," n.p.; Anand, Gupta, and Appel, "Introduction," 8.
9. Voskuil, "Victorian Plants," 37.
10. Frawley and McCalman, "Invasion Ecologies," 4.
11. On the role of terraria in facilitating plant movement, see Darby and L. Wells. On nineteenth-century global plant movement, also see Anker, Casid, Endersby, Grove, and Schiebinger.
12. Crosby, *Ecological Imperialism*, 7.
13. Drayton, *Nature's Government*, 229, 235.
14. Brockway, *Science and Colonial Expansion*, 85.
15. Voskuil, "Robert Fortune."
16. Brockway, *Science and Colonial Expansion*, 141–66.
17. Crosby, *Ecological Imperialism*, 7.
18. Voskuil, "Robert Fortune," 11.
19. See, for instance, Kerslake, Rieder, and Seed.
20. Chew, "The Monstering of Tamarisk," 235. Alt, by contrast, traces likenesses between red weed and introduced prickly pear in Australia. See Alt, "Prickly Pears."
21. Simpson, "A Short History," 4.
22. Simberloff, *Invasive Species*, 140–41.
23. "About Weeds," 479.
24. Marshall, *The New Water Weed*, 7. All subsequent references to this edition are noted parenthetically in the text.
25. "Alarming Invasion," 373.
26. Burton, *Great Days*, 32–37.
27. Simpson, "A Short History," 2.
28. Marder, *Plant-Thinking*, 25.
29. "Alarming Invasion," 372.
30. "Alarming Invasion," 372.
31. "The New Water Weed," 385.

32. Wells's portrayal of red weed's success and the other Martian plants' failure follows what biogeographers call the "rule of tens": of ten introduced plants, one will likely become permanently established; of ten that become established, one will likely become invasive. See Williamson and Fitter.
33. The concept of "invasive species" developed after World War II, largely in the work of British zoologist Charles Elton. The term (and Elton's work more generally) has been critiqued for its xenophobic connotations; see Chew, *Ending with Elton*; and Thompson, *Where Do Camels Belong?*
34. Tsing, "The Buck," 9.
35. Mabey, *Weeds*, 16–17.
36. Mabey, *Weeds*, 14.
37. Alt, "Prickly Pears," 144.
38. Anand, Gupta, and Appel, "Introduction," 3.
39. Alt, "Extinction," 26.
40. Crossley, *Imagining Mars*, 117.
41. Kerslake, *Science Fiction and Empire*, 102.
42. Simpson, "A Short History," 4.
43. See Frawley and McCalman, *Rethinking Invasion Ecologies*.
44. A. R., "The Work of Time," 528.
45. A. R., "The Work of Time," 528, 530.
46. Crossley argues that the novel analyzes "what it means to colonize another world, another species, another race," as Wells "expose[s] the delusions of grandeur and moral callousness in England's pursuit of its imperial goals"; see Crossley, *Imagining Mars*, 122, 123. Also see Markley.
47. The novel's elision of red weed has alternatively been explained as reflecting historical fact. Chew contends that "almost as abruptly as it arrived, *Elodea* encountered some still unidentified environmental resistance and slunk away." See Chew, "The Monstering of Tamarisk," 235. Chew's conclusions conflict with later observations of *Elodea* in Britain.
48. Huggan and Tiffin, "Green Postcolonialism," 1–2.
49. Wells, *Anticipations*, 342.
50. Cole, *Inventing Tomorrow*, 13.
51. Bright, *Life Out of Bounds*, 18.
52. Wells, "Intelligence on Mars," 346.
53. Wells, "The Things," 338, 340.
54. Levine, "Infrastructuralism," n.p.

55. Markley, *Dying Planet*, 21, 2.
56. Pecl et al., "Biodiversity," 1389.

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