

Arboreal Beings: Reading to Redress Plant Blindness

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A RECENT CENSUS OF EARTH'S BIOMASS (THE TOTAL MASS OF ORGANISMS IN A GIVEN area), indicates that plants, which constitute approximately 80 percent of all biomass, have been reduced by half since the beginning of human civilisation (Bar-On, Phillips and Milo). To put this in plain terms, as geobiologist Hope Jahren does in her engaging memoir *Lab Girl: A Story of Trees, Science and Love*, 'since 1990 we have created more than eight billion new [tree] stumps. If we continue to fell healthy trees at this rate, less than six hundred years from now, every tree on the planet will have been reduced to a stump' (n.p.). If one compares six hundred years to 470 million years (the time which plants have been on earth), one gains a sense of the rapid pace of deforestation: it will be 120 generations (if a generation is measured as twenty-five years), as opposed to nearly nineteen million generations.

One of the reasons for the mass destruction of vegetal life is 'plant blindness' a term coined by James Wandersee and Elisabeth Schussler in 1998 which is defined as '(a) the inability to see or notice the plants in one's environment; (b) the inability to recognise the importance of plants in the biosphere and in human affairs; (c) the inability to appreciate the aesthetic and unique biological features of the life forms that belong to the Plant Kingdom; and (d) the misguided anthropocentric ranking of plants as inferior to animals and thus, as unworthy of

consideration' (84).¹ The authors offer a number of reasons as to why humans overlook plants in this way, including the apparent homogeneity of plants' leaves and stems; people tend to be more educated about animals than plants through exposure to popular culture; plant populations grow close to one another and are seemingly static (compared to most animals) and are perceived as groups rather than individuals (hence the sense of plants as background); the brain is accustomed to perceiving difference and finds it difficult to attend to plants individually; plants are generally nonthreatening so humans tend not to use energy paying attention to them; and humans are programmed to recognise faces from an early age but plants do not have faces as we generally know them (84).

A 2016 study on plant blindness indicates that not only do biological factors make it difficult for humans to 'detect, recall and appreciate plants' but that cultural processes can also play a role, for 'language and practices affect the ways people develop and organise knowledge of their environments, as well as, as well as the world views and values they express in relation to other species' (Balding and Williams 1195). Philosophically, for example, plants have been ranked lower than animals on the ladder of nature, or *scala naturae*, the 'great chain of being'. This chain was ordered according to the perception of sentience, complicity and perfection. Plants were ranked above inanimate beings at the lowest end of the scale, and were followed by animals, humans, angels and God (Gangliano, Ryan and Vieira ix), a ladder from which, writes philosopher Michael Marder, 'both the everyday and the scientific ways of thinking have not yet completely emancipated themselves' (3). This has contributed to the belief, he continues, that 'vegetal beings are unconditionally available for unlimited use and exploitation' (3).

Humans' plant blindness is a threat to the survival of humans and non-humans, for plants produce the oxygen and sustenance that forms the basis of most animal habitats and all life on earth (Wandersee and Schlussler 82). Given the current rate of deforestation described by Jahren, it seems timely to look at ways in which awareness of plants and their conservation might be encouraged. Balding and Williams focus on several ways in which this might happen: enabling identification and empathy with plants, and the appropriate anthropomorphism of plants. This essay, while not a scientific paper measuring the impact of anthropomorphism on plant conservation, nonetheless suggests that literature may play a role in redressing plant blindness by foregrounding plants in narratives.

¹ It is important to recognise the ableism inherent in this term. Although blind people may not be able to see plants, they can still register plants through touch, taste, smell and sound.

The etymology of ‘read’ stems from the Old English word *raeden*, of Germanic origin, and is related to the Dutch word *raden* and the German word *raten*, meaning to ‘advise’ (*Oxford English Dictionary*). With this in mind, this essay explores the ways in which three texts—John Wyndham’s science fiction novel *The Day of the Triffids* (1951), Peter Wohlleben’s work of popular science, *The Hidden Life of Trees* (2015) and Ellen van Neerven’s story ‘Water’ from her collection *Heat and Light* (2014)—advise readers on plants and plant science. It examines the role of genre (science fiction, popular science, and fiction drawing on Indigenous worldviews and science) in shaping the literary representation of plants, and dwells upon the ways that anthropomorphism, in varying degrees, can connect readers to plants. It also details the risks inherent in mobilising this literary device, and looks to Indigenous science as a more respectful way of expressing the vitality of plants.²

The Day of the Triffids

John Wyndham’s *The Day of the Triffids* uses science fiction to plot a series of events that alter the perspective of its protagonist, biologist Bill Masen, from plant blindness to plant awareness.³ The novel opens with Masen in hospital with his eyes bandaged. He has been temporarily blinded and does not witness ‘the end of the world I had known for close on thirty years’ (Wyndham 7)⁴, caused by an intensely green meteor shower which blinds all those who see it, save those who are sleeping, underground or bandaged like Masen. His temporary blindness has been caused by triffid poison. Thought to have been introduced to England by Russians, triffids are large plants up to three metres tall which walk on three stick-like legs, hence the name *triffid*. They are carnivorous and inflict a poisonous sting, so they are kept in pens where they are harvested for their oil.

Masen is intimately connected with triffids from his childhood, first encountering a young specimen in his parents’ garden. After watching a film that shows triffids

² I am grateful to the anonymous reviewers and to Monique Rooney for their detailed feedback on this paper.

³ As one of the most popular post-apocalyptic novels of the 20th century—Jerry Määttä notes that it has ‘been kept in print by Penguin continually since the 1950s, and has been translated into more than a dozen languages and adapted numerous times, into several radio dramas, two television series, a few graphic novels, and a film of dubious merit’ (208)—there is a wide range of critical responses which interpret *The Day of The Triffids*. While a number of these dwell upon metaphorical interpretations of blindness, none reflect specifically upon plant blindness, although an essay by ecocritics Catriona Sandilands and Joni Adamson approximates a discussion of the condition. These two scholars contemplate the inability to see triffids for what they are in the context of ‘the blindness and hubris of profit-driven Western extractive industries’ (235), arguing that the novel is ‘not only an allegory of Cold War corruptions of nature, but also a specific depiction of the multi-agential biopolitics of plant-human relations in a post-World War II, globalizing world’ (235).

⁴ All further references are taken from this edition.

can 'walk' on 'three bluntly-tapered projections extending from the lower part' of the plant (40). Masen loosens the earth around the plant to encourage it to move and receives 'one terrific slam' (40) from the triffid, which knocks him out. He becomes 'one of the first persons in England to be stung by a triffid and get away with it' (41). The encounter brands him and, he notes, from then on he 'seemed to have a sort of link with them' (45) and passed 'a great deal of fascinated time watching them' (45). When a company begins to farm the triffids for their oil Masen immediately applies for a position 'on the production side' (45). While working with the triffids, he is struck in the face, but his colleague Walter administers an antidote and takes him to hospital, where he stays during the meteor shower. On recovering and leaving the hospital, Masen finds London in chaos, with blind people preyed upon by triffids. He draws upon his knowledge of triffid behaviour and biology to survive, falls in love with a woman named Josella, raises a family with her and retires to a remote farm. The triffid population grows, however, and when the plants amass and break through the farm's defenses Masen realises he must leave. The novel closes with his escape with his family to the Isle of Wight, where a community is gathering, separated from the triffids by the sea. Masen resolves to remain there until he or his descendants 'cross the narrow straits on a great crusade to drive the triffids back and back with ceaseless destruction until we have wiped out the last one of them from the face of the land that they have usurped' (272).

Masen's blinding by the triffid opens his eyes to their liveliness. Although this book is fiction, his interest in plants after his first childhood encounter with them mirrors research that proposes that direct experience with plants, particularly among young children, may increase their appreciation for and knowledge of plants (Balding and Williams 1196). This curiosity is not activated, however, until Masen learns that plants can move—that is, when they exhibit the qualities of animals. This accords with Wandersee and Schussler's research, mentioned earlier, that plants are overlooked because they seem static compared to animals. Masen observes that the triffids in his parents' garden 'was quite well developed before any of us bothered to notice it, for it had taken root along with a number of other casuals behind the bit of hedge that screened the rubbish heap' (24). The suggestion that the plant was beneath his family's notice, together with the other 'casuals' and their association with rubbish, demonstrates how irrelevant these plants are to humans—constituting another example of plant blindness. However, once it becomes apparent that triffids are carnivorous, people begin to 'see' them. Where in real life, as Wandersee and Schussler note, plants do not constitute enough of a threat to absorb humans' attention, in this novel, humans employ energy and intellect to avoid them.

Wyndham uses anthropomorphism, or 'the attribution of human personality or characteristics to something non-human, as an animal, object, etc.' (*Oxford*

English Dictionary), to create this shift from real-life, sessile plants to fictional, threatening, mobile plants. While they may have human attributes, Masen consistently refers to the triffids as 'plants'. This may create in the reader a sense of 'cognitive estrangement', a concept devised by science fiction scholar Darko Suvin to articulate how the genre 'places readers in a world different from our own in ways that stimulate thought about the nature of those differences, causing us to view our own world from a fresh perspective' (Booker and Thomas 4). As Booker and Thomas note, however, cognitive estrangement can be caused by almost any kind of literature, so they build on Suvin's understanding of science fiction to define it as 'fiction set in an imagined world that is different from our own in ways that are rationally explicable (often because of scientific advances)' (4). The plants' ambulatory capacity appears, in the context of their world, as 'rationally explicable' because of Masen's scientific approach to triffids, which involves studying and learning about their biology. It also appears in his unvarying tone and acceptance of triffid behaviour, as he muses, 'were triffids all that much queerer than mudfish, ostriches, tadpoles, and a hundred other things? The bat was an animal that had learned to fly: well, here was a plant that had learned to walk: what of that?' (42).

Masen's world also appears 'rationally explicable' because Wyndham underpins it with plant science. Adam Stock notes that Wyndham 'clearly knew about the synthesis of genetics and natural selection as early as his 1933 short story "The Puff-Ball Menace," in which a genetically engineered lethal fungus that looks like an oversized vegetable threatens to overrun England' (441). This idea presages *The Day of the Triffids* through its depiction of vegetable life taking over Britain. Adamson and Sandilands also propose that Wyndham's depiction of triffids is 'not merely a fantastical projection' (239). Although, they write,

it is clear that Wyndham's choice to have the triffids *walk* and communicate by *sound and hearing* was tinged with more than a little anthropomorphism, many elements of his depiction resonate with biological understandings of the period and almost prophetically with current research into plant mobility, signalling and neurobiology. (240, emphasis in original)

Plants, for example, can perceive light, chemicals, touch, temperature, electricity and sound (Korban 4-9) and they communicate with other plants, animals or microbes (Korban 13-16). When they are threatened, they can emit volatile organic compounds, or VOCs. Tomato plants, when attacked by aphids, release higher amounts of compounds such as methyl salicylate. This stops the aphids from settling on the plants (Guerrieri 122). These tactics echo the triffids' ejection of poison from their 'slender stinging weapon ten feet long' (42). Plants can also detect and respond to sound waves or vibrations, and a range of species

have evolved to use ‘buzz pollination’, or the release of pollen from flowers when they are vibrated by bees at a particular sound frequency (Gagliano 24). The triffids, meanwhile, are ‘uncannily sensitive to any movement near them’ (43) and communicate by clattering their stick-like projections. Masen’s colleague Walter, who has ‘a kind of inspired knack’ (46) with triffids and is far from blind to their capabilities, observes to Masen, ‘There they sit, with everyone thinking no more of them than they might be a pretty odd lot of cabbages, yet half the time they’re pattering and clattering away at one another’ (49). Masen’s use of the term ‘uncanny’, combined with his initial disbelief that the triffids can communicate, shows how humans’ plant blindness enables the triffids to ‘insinuate themselves into the world almost unnoticed’ (Adamson and Sandilands 237). Having realised that the triffids do in fact communicate, Masen concedes the extent of his plant blindness: ‘Up to then I’d fancied I’d watched triffids pretty closely, but when Walter was talking about them I felt that I’d noticed practically nothing’ (47). Walter also notices that a significant number of human casualties are blinded and surmises that, as the triffids are not really so different to humans, the blindness puts them at an advantage (48). This suggests that the latent message of Wyndham’s novel, even with its closing lines threatening ecocide, is that plant blindness puts humans in peril.⁵

Anthropomorphism has been associated with connectedness to nature, which in turn leads to conservation behaviours (Tam et al. 519). At first glance, this is not the case with *The Day of the Triffids*, with the man-eating triffids massing against the defences surrounding Masen’s farm and his corresponding threat to drive them ‘back and back with ceaseless destruction’ (272). Yet when viewed from the vantage point of the twenty-first century, marked by the destruction of vegetable life through deforestation, bushfires and rainforests in flames, it is difficult not to hear the subtext of this book: that plants, in dying, will have their revenge against the humans who depend up on them. As this is a book of fiction, however, its readers may not take its science seriously (although they may, like Masen, become more alert to plants, particularly those that might destabilise the *scala naturae*).⁶ This paper turns, now, to consider how plant blindness might be

⁵ Other readings of the novel highlight its references to disorder. It has been interpreted as a ‘literalised metaphor for the sudden and unexpected disorientation of an entire country or nation, and the novel as a whole might be read as a metaphor for the death and rebirth—or perhaps only the curing—of modern British society after the Second World War and the dismantling of the British Empire’ (Määttä 212). It has also been read as ‘one of the seminal zombie texts—even though it depicts shuffling, carnivorous plants instead of shuffling, human zombies’ (Määttä 212), signalling a profound discomfort with a changing societal order, and with plants as the progenitors of this change.

⁶ Sandilands and Adamson close their chapter with two real world examples of triffids: tumbleweed and dog-strangling vines, invasive species in the United States which thrive in particular environments. An Australian example of a triffid is *Opuntia*, or prickly pear. It is recorded as being introduced into Australia by Governor Philip in 1788 to create a cochineal industry from the insects which like to eat particular species. By 1920 the prickly pear had infested fifty-eight million acres and was estimated to advance at the rate of 2.4 million acres per

addressed through the mode of popular science expressed in Peter Wohlleben's *The Hidden Life of Trees*. Where Wyndham's truffids were inspired by fears of the Cold War and Russian invasion, Wohlleben, as manager of a nature reserve, foregrounds trees to educate his readers about their complexity, and their need for humans' stewardship. However, his focus is both aided and problematised by anthropomorphism.

The Hidden Life of Trees

Wohlleben's nature reserve is in the Eifel Mountains in western Germany. As he explains in his introduction, he was a timber cutter for more than twenty years, and 'knew about as much about the hidden life of trees as a butcher knows about the emotional life of animals' (xiii). As he assessed trees for their suitability for the mill and market, his appreciation for the trees was 'restricted to this narrow point of view' (xiii). When he introduced other ways of being in the forest, such as survival training, log-cabin tours and a section where people can be buried, he began to converse with his visitors and found that they were enchanted 'by crooked gnarled trees [he] would previously have dismissed because of their low commercial value' (iv). Looking through his visitors' eyes, he 'learned to pay attention to more than just the quality of the trees' trunks' and notices 'bizarre root shapes, peculiar growth patterns, and mossy cushions on bark' (iv). Consequently, his 'love of Nature—something I've had since I was six years old—was reignited' (iv). Meanwhile, Aachen University also began conducting scientific research programs in the forest which answered 'many questions ... but many more emerged' (xiv). Wohlleben's curiosity about and passion for the trees 'led to unusual ways of managing the forest' (xiv) such as banning machines. The trees, he observes, 'are breathing a collective sigh of relief and revealing even more of their secrets' (xiv).

This introduction touches on two of the approaches which Balding and Williams identify as helpful for encouraging awareness of plants and their conservation: empathy for plants and appropriate anthropomorphism. The former, as with the fictional Masen, stems from a strong correlation between experiences with nature, particularly in childhood (Balding and Williams 1196), but it still takes additional perspectives—in the form of the views of the visitors to the forest—to transform the trees from utilitarian material to wondrous living beings. While this points to the importance of being open to other perspectives on plants,

year (The State of Queensland 2). In 1926 the cactus moth *Cactoblastis cactorum* was released to biologically control *Opuntia stricta*. It proved a resounding success, and by 1932, almost seven million hectares of land infested with the cactus was made available to colonists (The State of Queensland 2). These massive outbreaks of prickly pear threatened the capacity for production of food to sustain humans in Australia, which in turn could be read as the disruption of an order which perceives human as holding sway over other-than-humans.

Wohlleben still chooses to liken trees to humans to communicate the majority of his plant science.

Wohlleben's book, as a work of popular science, relies upon narrative to explain the science of trees. Wohlleben divides his book into thirty-six chapters, each focusing on a particular aspect of trees which he has identified, such as friendship, forest etiquette, ageing, climate control, hibernation, burnout and tree immigration. His prose is simple, straightforward and at times conversational, and he creates small vignettes to dramatise the lives of trees, drawing upon anthropomorphism to animate the trees as characters. For example, he illuminates how trees such as beeches are social creatures, sharing food with their communities and nourishing their competitors. The reasons for this, he explains, 'are the same as for human communities: there are advantages to working together' (3-4). A tree cannot survive on its own, so it is in the tree's best interests to cooperate with and nourish those in its community. At other times Wohlleben draws on human corporeality to explain the workings of trees. When describing how trees age, he first approaches the subject 'from the human point of view' (60). Our skin is a barrier that holds in fluid and our insides; it absorbs and releases gas and moisture; it blocks out pathogens and is sensitive to contact; and it sags with age. Likewise with trees, the skin of which is known as bark. Bark retains moisture for trees, protects them from the aggressors of the outside world and provide a barrier against fungi. When the tree develops a break in its bark it is, Wohlleben writes, 'at least as uncomfortable for a tree as a wound in our skin is for us' (61). By anthropomorphising the tree, he helps readers to understand that it is a being with sentience and specific needs that must be satisfied for it to flourish.

To cite another example, when trees are taken from their communities, where they have evolved to maximise the conditions in which they live, they become, Wohlleben suggests, like 'street kids' (169). Those planted in urban areas are watered and pampered when they are young, but as they grow and try to stretch, their roots cannot branch into the hard, compacted soil of the parks, or around drainage systems beneath the roadworks. It is often hotter for trees in urban areas. While forests can cool themselves on hot summer nights, in cities the streets and buildings radiate the heat they have absorbed during the day and the trees cannot cool down. Dogs also urinate upon trees, which can burn bark and kill roots, and they must contend with pollution and fewer mycorrhizal fungi, which help transport nutrients. In essence, they have been removed from their families and placed among strangers. They do not have a 'mother to nurse them or keep a strict eye out to make sure the little ones don't grow too quickly. No cozy, calm, moist forest around them. Nothing but solitude' (169).

Here, Wohlleben imports gendered notions of caregiving to explain the work of trees, without considering that fathers can, and do, care and nurture, and that caregiving is not a role exclusive to women. In one sense this is indicative of the difficulties of using anthropomorphism to explain the processes of non-humans. It reifies existing cultural norms, rather than challenging and provoking them to throw up new ways of thinking and interacting with the other-than-human world. As evolutionary ecologist Monica Gagliano argues, 'there is no other doorway to understanding the inner life of all these other beings' (Livni). However, this may work to blind readers who might otherwise see plants as entities in their own right. For example David Griffin, who discovered bat sonar, 'argued that the complexity of animal behaviour implies conscious beliefs and desires, and that an anthropomorphic explanation can be more parsimonious than one built solely on behavioural laws' (Wynne 606). Other difficulties with anthropomorphism include its direction towards individuals at the expense of the mass (such as herds of cattle) or caring for one species at the expense of its predators or competitors (Root-Bernstein et. al. 1584-9).

Wohlleben's use of anthropomorphism to convey plant science has been criticised by the scientific community for its rather loose use of science. A review by Sharon Kingsland notes that the book 'infuriated professional forestry scientists', with two German scientists launching an online petition in February 2017 to call on scientific colleagues to challenge Wohlleben's claims. The petition received over 4,500 signatures and 'provoked a discussion, more visible in the German and French media than in English language media, about how we represent scientific knowledge to the lay public' (Kingsland). Kingsland comments that although Wohlleben 'makes many valid points about how ecological relationships operate in the forest, his use of scientific literature ... is often a springboard to an imagined conclusion that goes beyond the scientific facts'. In this, Wohlleben faces criticisms common to purveyors of popular science, such as that the mode presents 'a usually positive public face of science, inspiring some bitter arguments over who is allowed to speak for science in the process' (Bell). However, as Wohlleben's text shows, using anthropomorphism to foreground plants is a powerful tool.

Balding and Williams note that anthropomorphism is frequently used in environmental discourse to promote conservation, but there is little evidence that it works with plants (1196). The huge success of Wohlleben's book—he has sold 800,000 copies in Germany and been translated into numerous languages—suggests that anthropomorphism might work to foreground plants and prompt consideration for them. Journalist Richard Grant, for example, found his perspectives shifting after reading Wohlleben's account of trees: 'From time to time, I think of objections to Wohlleben's anthropomorphic metaphors, but more often I sense my ignorance and blindness falling away. I had never really looked

at trees before, or thought about life from their perspective. I had taken trees for granted, in a way that would never be possible again'. This response raises the issue of the utility of fictional tropes in communicating plant science in ways that challenge readers' plant blindness. It also reflects evidence that 'composers of popular science have strongly held beliefs, misplaced or others, that nonscientists might find something of value in knowing something about science' (Bell).

The success of Wohlleben's book might also indicate that people are thirsting for stories about plants. Perhaps there is growing realisation that, given the current climate and extinction crises, plants are key to our survival. Wohlleben comments on this, writing that 'In these times of dramatic environmental upheaval, our yearning for undisturbed nature is increasing' (233). In this the work has an avowedly activist ethos. In his introduction to the English edition of his book, Wohlleben references the introduction of wolves to Yellowstone National Park, which reduced the elk populations and, in turn, facilitated the return of trees such as aspens, willows and cottontails. The wolves, he writes, 'turned out to be better stewards of the land than people', and he hopes this example will 'help people appreciate the complex ways that trees interact with their environment, how our interactions with forests affect their success, and the role forests place in making our world the kind of place where we want to live' (xii).

While Wohlleben's text is heterodox in terms of science writing because of its reliance upon anthropomorphism, it is also distinctive in its engaging communication of how trees can be read, and in its encouragement of seeing trees in new ways through reading. At the same time, this reliance on anthropocentrism blinkers the reader who would like to see trees in their own right, unfettered by comparisons to humans. By turning, now, to a mode of perceiving and representing the world that rejects anthropocentrism, but still acknowledges the vitality of the non-human world, this paper contemplates another way in which we might see and respond to plants: not as resources or as human equivalents, but as our kin.

Heat and Light

Michael Hall in *Plants as Persons* includes a chapter on Indigenous peoples' relationships with plants. He refers to Whitt et al to explain that 'Indigenous responsibilities to and for the natural world are based on an understanding of the relatedness, or affiliation, of the human and non-human worlds, which is best understood in its primary—genealogical—context' (4). This context refers to the stories of origins, 'showing how ancestors and descendants course together through a continuous, unfurling history' (4). For Indigenous peoples, these

genealogies do not typically confine themselves to the human but 'address themselves to specific places, and the non-human beings inhabiting them' (4). These beings, human and non-human, are kin. In the context of Indigenous Australian peoples, as Deborah Bird Rose writes in *Nourishing Terrains*, these places are part of country, 'a living entity with a yesterday, today and tomorrow, with a consciousness, and a will toward life' (7). The relationships between people and their country are 'intense, intimate, full of responsibilities and, when all is well, friendly. It is a kinship relationship and, like relations among kin, there are obligations of nurturance. People and country take care of each other' (49). In the context of plants, Hall explains, this means contemplating plants in terms of their 'personhood', which he defines as 'a crucial, all pervading concept—for as persons, plants are recognised as volitional, intelligent, relational, perceptive, and communicative beings' (100). He stresses, however, that 'this recognition of plant personhood is not anthropomorphic' (105). Rather, for certain plant lineages, 'Dreaming stories tell of their initial humanity and then their metamorphosis into the beings that exist in-country today' (107). He provides the example of a Gunwinggu story in which Mananda, an old man from South Goulburn Island who was unable to walk far, sat on one spot while his sons went off. He stayed there so long he became a yam (107).

Ellen van Neerven's story 'Water' from her short story cycle *Heat and Light* depicts protagonist Kaden's interactions with plant persons as she comes to recognise them as intelligent, perceptive beings. Kaden begins a job as Cultural Liaison Officer on Russell Island, among the Moreton Islands, off mainland Queensland. The island has been set aside for Aboriginal people in the president's neo-colonial refashioning of race relations. Kaden's role is to work with what are termed 'sandplants', although she prefers the terms 'plantpeople' or 'sandpeople as it 'seems more sensitive' (75). The plantpeople appeared when the government began mining the sea to create islands in preparation for an alternative nation for Aboriginal people. They are resistant to being moved and some have 'rooted', or Kaden explains, 'they firm their roots to an area, into the ground, and are hard to persuade to move' (76). The first time she sees them, Kaden describes them as 'startlingly human-like... and alarmingly unhuman. Green, like something you would see in a comic strip, but they are real' (78). Kaden's role is to give the plantpeople a bucket of formula. The reasons for this are initially unclear, although Larapinta, the plantpeople's leader, comments that it 'keeps the soapberry bugs away' (90).

Kaden accidentally discovers from a botanist that the formula being fed to the plantpeople is to make them docile, and that the percentage of chlorine in the formula is being increased over time. Kaden, as a liaison officer, wonders whether she should discuss this with the plantpeople. The botanist is scathing.

He snorts. 'We're talking about plants here'.
 'They're not just plants, you must know that'.
 'They're not entirely human, though, are they? Not close. We've been having these debates for years. About scientific testing on animals for medical research. At the end of the day, we have to put humans first'.
 (94)

In spite of her uncertainty about how to categorise the plantpeople, Kaden is intrigued by Larapinta, to the point where she falls in love with her and realises that 'To feel she is human now is a lie, I must be with who she is' (103). The end of the story sees a magnificent resurgence of the plantpeople who, it transpires, are Kaden's 'old people'—her ancestors, the jangigir (113). They band together to disrupt the project to segregate Aboriginal people by moving them onto the islands:

In the clear water behind the ferry I can see them. They are everywhere. Stretching out as far as my vision reaches. And then I know there are as many behind them. The brown reeds of their hair are all that is showing. They move in formations, in shapes similar to the last letter of the alphabet. Larapinta is one of them. There must be thousands. I step onto the ferry and stand next to my uncle. The water is rising around us and I can feel the force in the leaping waves and what we're about to do'. (122-3)

The phrase 'the water is rising around us' can be interpreted as a reference to the rising seas of our warming world, but rather than seeing this as a threat, Kaden, bolstered by her connection to her ancestors and country, has the confidence and knowledge to survive. Larapinta tells her, "I am renewal" and that she 'was made to adapt' (103).

There are resonances between this story and *The Day of the Triffids*, with the surging of arboreal beings on or near a body of water. Yet the sense of restoration at the end of 'Water' is diametrically opposed to fear and destruction at the end of *The Day of the Triffids*. Perhaps drawing upon Aboriginal peoples' experiences of invasion in Australia, it suggests a need to read living beings in a way that recognises and respects their agency, rather than annihilating it. The sense of impending apocalypse present in Wyndham's novel might also be, as Indigenous author Tony Birch muses, 'something of a Western fetish', whereas for Indigenous peoples in Australia 'previously faced with environmental challenges—due to forced external circumstances—have been innovative and resilient in their responses to the immense difficulties faced'. Those that have survived have done so because of 'courage, ingenuity and creativity' (Birch). This could account for Kaden's sense of fierce freedom and confidence conveyed by

the story's closing lines. Kaden's kin, both her uncle and her ancestors, whom she has read and understood, stand with her, connected to the world as trees are. As the story develops, Kaden (who yearns to know more of her family) learns the genealogical context for both herself and Larapinta, and of the connections between them. Larapinta, as a plantperson, is her kin.

Where Wyndham leads his protagonist from plant blindness to awareness through fear, van Neerven achieves this same process through love. As she notes in an interview with scholar Belinda Wheeler, 'By writing a romantic relationship between a human and nonhuman, I'm including the reader in a broader discussion' (296). This understanding of connection through love challenges the hyper-separation between nature and culture in Western societies observed by environmental feminist Val Plumwood, which positions nature as an 'other' to be dominated and exploited, as the triffids are for their oil. Philosopher Michael Marder considers such exploitation in terms of plants, writing that the effect of this failure to 'think through the logic of vegetal life, beyond its biochemical, cellular, or micro-molecular processes and ecological patterns' has been the assumption that 'within the broad evolutionary frame of reference, the existence of plants is less developed or less differentiated than that of their animal and human counterparts' (2).

Kaden draws on both Western and Indigenous ways of knowing to answer a question she asks of herself: 'What is a plant?'. She dwells upon the division between plants and animals, which goes back to Aristotle, 'who distinguished between plants which generally do not move, and animals which often are mobile to catch their food' (96). It is a false division, for plants do move and find food, they are just very slow about it. 'The second question', Kaden thinks, 'is harder. It is: What is a human?' (96). When Kaden watches the plantpeople walk through water, she sees 'their shoulders swing back and forth like some smooth stroke and it's frightening' (89). This evokes the movement of a triffid which, when it 'walked' on its 'three bluntly tapered projections extending from the lower part', it moved 'rather like a man on crutches. Two of the blunt "legs" slid forward, then the whole thing lurched as the rear one drew almost level with them ... it gave one a kind of seasick feeling to watch it' (27). The triffids, with the awkward motion of their stick-like legs, challenge 'not only the categories of plant, animal and human, but also the notion of categorisation itself' (Matthews 114). A distinction must be made here: the triffids disrupt Western notions of categorisation, as designated by the *natura scilicet*, but these are not the same as Indigenous categories. Which raises the question: what if triffids are viewed as plantpeople (albeit more hostile than those such as Larapinta)? How might this have changed the shape of Wyndham's narrative?

The use of fiction, specifically science fiction, encourages speculation on the demarcations of living things, although van Neerven's expression of science differs to that of Wyndham. As Iva Polak notes in her analysis of 'Water', the story illuminates the 'clear use of what Grace L. Dillon calls "Indigenous scientific literacies"' (131), or that which, echoing Rose, 'resides in this sense of spiritual interconnectedness among humans, plants, and animals' (Dillon 26).⁷ In the context of Indigenous scientific literacies, 'sustainability is about maintaining the spiritual welfare of natural resources rather than simply planning their exploitation efficiently so that humans do not run out of necessary commodities' (Dillon 26), as happens in *The Day of the Triffids*. The ending of 'Water' aligns with this idea of scientific literacy in its suggestion that if Australia is to survive the disruption of climate change and pollution, non-Indigenous Australians must pay heed to those scientists who have carried out their own experiments through experiences on this country for 60,000 years, as van Neerven writes in her essay 'The Country is Like a Body':

Living connected to country, there's no wonder Traditional Owners are steps ahead of science. Indigenous Knowledges are old knowledges. They are accumulated through years of trial and error. They should be valued for what they are, a tool to meet the challenges of a changing climate.

If non-Indigenous readers attend to Indigenous peoples' ways of reading the country to care for and conserve fragile ecosystems, we might be able to redress plant blindness.

This depends, too, on changing the way we perceive and define plants in Western culture. Wyndham and van Neerven use fiction to destabilise the demarcations between animal and human, but it is something which Wohlleben also discusses. In his chapter 'Tree or Not Tree?' he ventures briefly into the debate on plant consciousness. As well as signaling, plants have systems and molecules similar to those found in animals, such as the sensitivity of roots to stimuli such as toxic substances, impenetrable stones or saturated soil. Although plants show they can communicate, react to stimuli and have memory, debate still bubbles. Wohlleben's stance is that the similarity between plants and animals threatens to blur the boundary between them. 'So what?' he continues,

⁷ It is interesting to note Van Neerven's challenge to strict divisions operates throughout *Heat and Light* as a whole. The text, as scholar Helena Kadmos observes, 'interweaves storytelling, realist, magic realist, gothic and speculative traditions, and these multiple layers significantly increase the text's capacity to represent diversity beyond what might be possible in one form alone'.

What would be so awful about that? The distinction between plant and animal is, after all, arbitrary and depends on the way an organism feeds itself: the former photosynthesises and the latter eats other living beings. Finally, the only other big difference is in the amount of time it takes to process information and translate it into action. Does this mean that beings that live life in the slow lane are automatically worth less than ones on the fast track? (84)

Here, Wohellen relies on reasoning and rhetoric to posit the question which Wyndham and van Neerven explore through the imaginative realm. Although Wohlleben, too, dips his toes into the fictional world, he arrives at the same conclusion as Balding and Williams: that it is not just biology, but cultural constructions that are in part responsible for a blindness to plants. Perhaps if non-Indigenous writers and readers look to other cultures, such as Indigenous cultures, they might learn how to recognise plants not only as entities in their own right, but also as kin for whose lives we are responsible.

Reading Plants' Lives

Masen's act of recounting his story brings the triffids from the background to the foreground of readers' consciousness, educating them about plant behaviour. Kaden, meanwhile, reads research papers on the plant people and decides they are 'a very intelligent species' (76). She also reads an interview with a plant person, in which the plant person spoke 'a steady, formalistic English. Hers was the only first-person account and insight I have into what these people are about. A plant's mind' (77). These accounts signal that reading about plants is an important way of recognising their behaviours and needs. However, to just read about plant science is often not enough—if it was, these fictional readers, as well as real-world readers, would all be experts by now. It is important to look beyond our pages (even if these are often constituted by plants) to read vegetal life in its variety and complexity. As Wohlleben writes, 'The main reason we misunderstand trees is that they are so incredibly slow. Their childhood and youth last ten times as long as ours. Their complete life-span is at least five times as long as ours. Active movements such as unfurling leaves or growing new shoots take weeks or even months. And so it seems to us that trees are static beings, only slightly more active than rocks' (230). When we take the time to pay attention to plants, by reading them on the page and in real life, their intricacies become apparent.

A key focus in each of these three texts is the human curiosity about plants, from Bill Masen's early poking of the triffid that grow in his parents' garden, to Wohlleben's attentiveness to the trees in his forest, to Kaden's love—both physical and emotional—for Larapinta the plantperson. Another significant

feature, also found in Hope Jahren's *Lab Girl*, is the use of a first-person authorial voice. This technique leads readers to understand that when humans encounter plants, in both fiction and non-fiction, in real life or the imaginary realm, and engage with them closely, the marvel of their chemical communications, the beauty of their forms, and the wonder of their myriad interactions with their environment becomes apparent, and that this is science at work. We need more science, both western and Indigenous, and we need new expressions of that science through stories, both scientific and appropriately anthropomorphised, to convey the importance of plants. Not only do plants support us but, if we look closely enough, bringing plants from the background to the foreground, we find that they are also remarkable forms of life.

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Works Cited

- Balding, Mung, and Kathryn J. H. Williams. 'Plant Blindness and the Implications for Plant Conservation.' *Conservation Biology* 30.6 (2016): 1192-9.
- Bar-On, Yinon M., Rob Phillips and Ron Milo. 'The Biomass Distribution on Earth.' *Proceedings of the National Academy of Sciences of the United States of America* 115.25 (19 June 2018): 6506-11.
- Booker, M. Keith, and Anne-Marie Thomas. *The Science Fiction Handbook*. Wiley-Blackwell, 2009.
- Birch, Tony. 'It's Been, It's Here: Tony Birch on Climate Change's Past and Present.' *The Wheeler Centre*. 24 March 2015. <<https://www.wheelercentre.com/notes/it-s-been-it-s-here-tony-birch-on-climate-change-s-past-and-present>>.
- Dillon, Grace L. 'Indigenous Scientific Literacies in Nalo Hopkinson's Ceremonial Worlds.' *Journal of the Fantastic in the Arts* 18.1 (2007): 23-41.

- Gagliano, Monica. 'Seeing Green: The Re-discovery of Plants and Nature's Wisdom.' *The Green Thread: Dialogues with the Vegetal World*. Ed. Patrícia Vieira, Monica Gagliano and John Ryan. Lexington Books, 2016. 19-36.
- , John C. Ryan, and Patrícia Vieira. 'Introduction.' *The Language of Plants: Science, Philosophy, Literature*. Ed. Monica Gagliano, John C. Ryan, and Patrícia Vieira. U of Minnesota P, 2017. vii-xxxiv.
- Grant, Richard. 'Do Trees Talk to Each Other?' *Smithsonian Magazine*. March 2018. <<https://www.smithsonianmag.com/science-nature/the-whispering-trees-180968084/>>.
- Guerrieri, Emilio. 'Who's Listening to Talking Plants?' *Deciphering Chemical Language of Plant Communication*. Ed. James Blande and Robert Glimwood. Springer, 2016. 117-37.
- Hall, Matthew. *Plants as Persons: a Philosophical Botany*. State U of New York P, 2011.
- Jahren, Hope. *Lab Girl*. Alfred A. Knopf, 2016.
- Kadmos, Helena. 'Re-Imagining Indigenous Australia through the Short Story: *Heat and Light* by Ellen van Neerven.' *Australian Literary Studies* 33.3 (2018). <<https://doi.org/10.20314/als.ef818cfc89>>.
- Kingsland, Sharon Elizabeth. 'Facts or Fairy Tales? Peter Wohlleben and the Hidden Life of Trees.' *Bulletin of the Ecological Society of America* 99.4 (2018).
- Korban, Richard. 'The Language of Plant Communication (and How it Compares to Animal Communication.)' *The Language of Plants: Science, Philosophy, Literature*. Ed. Monica Gagliano, John C. Ryan and Patrícia Vieira. U of Minnesota P, 2017. vii-xxxiv.
- Livni, Ephrat. 'A Debate over Plant Consciousness is Forcing us to Confront the Limitations of the Human Mind.' *Quartz*. <www.qz.com/1294941/a-debate-over-plant-consciousness-is-forcing-us-to-confront-the-limitations-of-the-human-mind>.
- Määttä, Jerry. 'The Politics of Post-Apocalypse: Ideologies on Trial in John Wyndham's *The Day of the Triffids*.' *Science Fiction, Ethics and the Human Condition*. Ed. Christian Baron, Peter Nicolai Halvorsen and Christine Cornea. Springer, 2017. 207-26.
- Marder, Michael. *Plant Thinking: A Philosophy of Vegetal Life*. Columbia UP, 2013.
- Matthews, Graham J. J. 'What We Think about When We Think about Triffids: The Monstrous Vegetal in Post-War British Science Fiction.' *Plant Horror: Approaches to the Monstrous Vegetal in Fiction and Film*. Palgrave Macmillan, 2016. 111-27.
- Oxford English Dictionary*. Oxford University Press, 2000.
- Plumwood, Val. *Feminism and the Mastery of Nature*. Routledge, 1993.
- Polak, Iva. *Futuristic Worlds in Australian Aboriginal Fiction*. Peter Lang, 2017.

- Root-Bernstein, M., L. Douglas, A. Smith and D. Veríssimo. 'Anthropomorphized Species as Tools for Conservation: Utility beyond Prosocial, Intelligent and Suffering Species.' *Biodiversity and Conservation* 22.8 (2013): 1577-89.
- Rose, Deborah Bird. *Nourishing Terrains: Australian Aboriginal Views of Landscape and Wilderness*. Australian Heritage Commission, 1996.
- Sandilands, Catriona, and Joni Adamson. 'Insinuations: Thinking Plant Politics with *The Day of the Triffids*.' *The Language of Plants: Science, Philosophy, Literature*. Ed by Monica Gagliano, John C. Ryan and Patrícia Vieira. U of Minnesota P, 2017. 234-52.
- Stock, Adam. 'The Blind Logic of Plants: Enlightenment and Evolution in John Wyndham's *The Day of the Triffids*.' *Science Fiction Studies* 42.3 (2015): 433-57.
- Tam, Kim-pong, et al. 'Saving Mr. Nature: Anthropomorphism Enhances Connectedness to and Protectiveness toward Nature.' *Journal of Experimental Social Psychology* 49.3 (2013): 514-21.
- The State of Queensland, Department of Agriculture and Fisheries. 'The Prickly Pear Story.' 2016. <https://www.daf.qld.gov.au/_data/assets/pdf_file/0014/55301/IPA-Prickly-Pear-Story-PP62.pdf>.
- van Neerven, Ellen. *Heat and Light*. UQP, 2014.
- . 'The Country is Like a Body.' *Right Now*. 26 October 2015. <<http://rightnow.org.au/essay/the-country-is-like-a-body/>>.
- Wandersee, James H., and Elisabeth E. Schussler. 'Preventing Plant Blindness.' *The American Biology Teacher* 61.2 (1999): 82-6.
- Wohlleben, Peter. *The Hidden Life of Trees: What They Feel, How They Communicate: Discoveries from a Secret World*. Greystone Books, 2016.
- Whitt, L. A, M. Roberts, W. Norman and Vicki Grieves. 'Indigenous Perspectives.' *A Companion to Environmental Philosophy*. Ed. D. Jamieson, 2001. Blackwell, 3-20.
- Wyndham, John. *The Day of the Triffids*. Gollancz, 2016.
- Wynne, Clive D. 'The Perils of Anthropomorphism.' *Nature* 428.8 (April 2004): 606.