

Plant Blindness and Repair

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■ Olga Kisseleva with a restored afarsimon tree in the Negev desert, Israel, 2016. Photo Lila Chak.

INTRODUCTION: PLANT BLINDNESS

If 'plant blindness' is a condition that requires repair, there is an implicit suggestion that humans are healthy and high-functioning so long as they have the ability to see. 'Plant blindness' is a concept coined in 1998 referring

to the human inability to identify and appreciate vegetal life in immediate environments (Wandersee and Schussler 2001). The term 'plant blindness' is gaining traction in the fields of science (Allen 2003, Balding 2016) whilst also being discussed and adopted by herbaria (Summerell 2019). The term could be critiqued for engendering abled/disabled social binaries, because the condition of blindness connotes a physical lack. However, this paper directs attention to 'plant blindness' within the context of a post-human shift (Hirsh 2020), as a reminder that humans are but one part of the sum of nature. In addition, this paper argues that it is humanity's hubristic inclination to experience an evolutionary decline of ecological insight (understanding through knowledge and experience) and a concomitant decline in 'seeing' our immediate and critical environments. It is this that makes humans vulnerable to extinction. The paper will investigate two case studies—the works of artist Olga Kisseleva's *EDEN* 2012–15 and designer Gionata Gatto's *Geomerce* 2015—to support a potential revaluating of seeing the vegetal and a greening insight that might go some way to repairing 'plant blindness'. This paper's ecocritical argument is that the incorporation of technology to art and design may provide an interruption to evolutionary declines in plant-human relations.

The first question to pose is why 'plant blindness' is a problem at all. An inability to see or value one's immediate vegetal environment is more than a problem of poor understandings of nature. Not seeing or valuing the vegetal results in a lack of appreciation or defining of the vagaries and multiplicity of vegetal life. So what? Well, there is evidence to support this has trickle-on effects that create a lack of care or responsibility for our green worlds and a subsequent decline in conservation and restoration (Balding and Williams 2016). This,

by reasoning, can result in an approbation of individual human responsibility. This has been caused, according to Aaron Hirsh, in part by the post-Darwinian trend of considering humans as part of nature, but without dominion over it. Many scholars have endorsed a human humility in the face of mass extinctions and climate change threats, as a way of seeking a more equal register of ontological importance (Gibson 2018). But Hirsh argues that it has also created the adverse effect of humans not restricting fishing, farming, mining and so forth adequately, because of the more humble notion that humans are not especially important and therefore are not powerful enough to upset the global natural course of evolution (Hirsh 2020).

In that provocative vein, another question can be posed. Will any attempts to repair our 'plant blindness' and restore humans to a closer understanding, experience and connection with the vegetal world, restore the natural world to its former health and glory? Or is there a chance that the repair will cause new ill-effects? As a human with astigmatism and myopia, I find my poor eyesight distinctly difficult. When I snorkel, the kelp forests are blurred because I can't wear contact lenses (ongoing trauma from wearing hard lenses in the 1980s – yes, I know they are easier to wear now, but, as I say, I am traumatised). When I bushwalk, my sunglasses, which are prescription, slide down my nose and my vision becomes imperfect and blurred again. But, if I could better see the scabby and rubbery scales of the ocean kelp, if I could better see the leaf nodes and pink bark skeins of the bush angophora, will I be repaired, as a human within nature, who sees the details of my environs? It's hard to imagine that 20-20 vision will make me a better ecocitizen. This introduces the additional necessity for understanding what we see for the condition to be repaired.

In the past, I have argued that a plant contract ensures better human-vegetal relations, via a contract between one plant and one human at a time. My arguments have been evidenced with evaluations of artists and designers working with the vegetal, as mediations or communicators of difficult issues, such as climate change and plant extinctions. This ecocritical work sits within the field of Critical Plant Studies, which sits within a

discipline of environmental aesthetics.

As mentioned, the term plant blindness has been criticized as having able-oriented tendencies, that is, misusing a term regarding seeing or not-seeing in an able-centred way. There are also associations between blindness and catastrophic fear, the suggestion being that if humans do not pay closer attention to plant life, there will be dire consequences. A threat. However, there are several botanic gardens – for example Denver, Chicago and Washington Botanic Gardens—that address plant blindness through education programs to improve the way humans restore and care for their umvelts. In Australia, plant specialists such as Brett Summerell, Chief Scientist at the Plantbank in Sydney's Mount Annan, and Tim Entwistle, Director at the Royal Botanic Gardens, Melbourne, have adopted the term in their plant communications because it directly and effectively transmits a problem related to the relevance of plant life to all ecosystems that the botanic gardens feel they can correct (Summerell 2019).

Agency is an important part of 'plant blindness' because it refers the responsibility back to the human. *Learn to see vegetal life*, the term suggests. Agency is also an element of plant philosophy (Marder 2013) as it refers to the independent activity of plant life, particularly their distributed and multiple behaviours irrespective of human activity or thought (Gagliano 2017). Plant agency reminds us that plant activity will be undertaken whether or not humans can see the activity. Agency and activity suggest the performativity of plants, especially when mediated by art, design and technology.

This raises another issue surrounding 'plant blindness' because we *can't* see what we *can't* understand. This 'chicken and egg' condition relates to the distinction between the facility of seeing or not—becoming blind to the vegetal—and the relationship between knowledge and vision and the visible. Consider walking into a greenhouse of plants. You push open the heavy glass door and are overwhelmed by the moist warmth and fetid air of mist, earth, clay pots and almost-rusted gardening tools. It is difficult to appreciate the entirety of the greenhouse, impossible to see and understand all the

plants and all the elements of the greenhouse at once. This is a problem of human eyesight and of human cognition – we can't take in and process (make sense of) all the data around us at once. Information may only become visible and knowable once we are no longer in the greenhouse. Memory and sensations contribute to understanding, sometimes after the fact. Only after wandering around and looking up and down can the contents of the greenhouse be appreciated. Likewise, when considering a tree, it is a challenge to appreciate the structure of trunks, branches, foliage and roots whilst also understanding the inner workings of emitting chemicals and gasses, the way chlorophyll absorbs sunlight, or the roots are connected by mycelium networks of communicative data. These considerations go some way to explaining how and why many humans suffer 'plant blindness'... there is a lot to see.

Visibility, then, is critical to plant blindness. Seeing, as a concept of understanding, is the point at which information has become understood. Seeing depends upon a human or other species with eyes. Visibility infers that an object has a phenomenological sensory capacity, with or without being seen. If plants have visibility, that does not necessarily depend upon a human viewing of them, nor how humans tell those plant stories.

THE ECOPOETIC APPROACH TO REPAIR

It may be possible, through a repairing of plant blindness, to find new ways to involve the plants themselves in participatory storytelling via ecocritical narrative. Ecocritics argue that what appears to be a deepening global environmental crisis makes it necessary that the profession pay attention to environmental issues, specifically by addressing how literature influences human behaviour with regard to the natural world (Legler 1997). Val Plumwood has led the charge in tying together uses and abuses of both the environment and women: seeing the land as 'woman', that is—women and the green landscape presenting as a pleasant backdrop (over there and other) to aggressive male action.

The critical concept here is that plant-writing or vegetal narrative or ecocriticism, even when

describing works of art and design, cannot speak for the plant nor does it follow any concepts where authors 'allow the plant to speak' (Ryan). Patricia Vieira has articulated the idea of phytography, which is a valuing of literature as plant-writing (Vieira 2015). In this, Vieira draws on Derrida's arche-writing to propose the importance of plants' inscription on the world and how that mark or series of marks affects narrative and literature. Her aim, and mine, is to communicate plant time and behaviour and relevance in a way that is palatable for humans and is true to an ecofeminist approach, whereby plants and women are liberated from being inert background to action.

Plant narrative, then, is an ecocritical approach to communication that sits alongside plants, that can only ever emerge and speak alongside the plant (Gibson and James 2019). Any narrative referred to in the context of art and design is not intended to impose upon plant life nor exact any kind of dominion over plant life. Instead, plant narratives explore how humans imagine plant behaviour (Karban 2018). In other words, humans cannot escape their anthropocentrism and humans also cannot 'allow' plants to speak, as they do not hold authority, as ecofeminist approaches reveal (Plumwood 1997). However, we can engage in exchanges of experience that deepen each time.

ROBOTANY IN ART AND DESIGN – TECHNOLOGY OF REPAIR

So, onwards to the crossover of plants and technology, where narratives of human-plant interaction might emerge. There are extant examples to acknowledge. Robotany refers to art and design works that are created at the crossover of plants and technology, in an art and design context, and often in terms of robotic, automated technologies or algorithmic processes (Gibson 2018). Broad examples of robotany include robotic or sonic plant works such as *Plantas Parlantes* (2010) by the artist group Ricardo O'Nascimento, Gilberto Esparza, Javier Busturia and Jigni Wang¹ Here the artists place small plants on a rack, hooked up to sensors (attached to ecotransmitters) that make musical notes when touched by human hands. Likewise,

Noisy Cauliflower (2013), by Cara Stewart, comprises a cauliflower hooked up to a sensor (and software via a laptop) to create sound once the vegetable is touched. The result of these gestural interfaces is noise or sound. Audiences are encouraged to understand that what they hear is the communicative capacities of plants – the plants are talking. Humans cannot know plant knowledge systems or their communicative language but there is a widespread urge to engage with the possibilities of understanding plants by performing an inter-relational act.

Robotany, then, is often reliant upon the secondary sense of hearing or listening. This might be a possible cure for 'plant blindness' as it introduces additional senses. If humans have become too familiar with plant life as an inert backdrop to human action, perhaps the introduction to plants' sounds and communicative capacities will arouse deeper interest in plants and therefore restore their value as things to be seen, as having their own particular visibility, beyond being subjects that can be seen.

Robotany illuminates how humans are attracted to the representative capacities of plants. This is partly because plant-technology art and design works move beyond conventions of botanical illustration that has, through history, presented plants as flat, static and non-dynamic. It is also partly because the imagery of plants in history has had allegorical value – as representing a human story of plants about humans for humans. Think of the religious paintings of the Annunciation in almost every church, cathedral or museum across Europe. The standard image is of the Archangel Gabriel presenting the Virgin Mary with a white lily, to announce she will be the mother of Jesus. The white lily represents purity but refers to human purity, rather than plant purity. In fact, the allegory has nothing to do with the characteristics or behaviours of the white lily itself.

Other examples of robotic structures that incorporate plants include the plant-bot created by Roxana Gherle, Sergiu Mezei and Mihai Garda-Popescu, where the plant is powering and powered by the bot, linked by a motivation to source water. These plant-bots are based

on the iRobot Create platform combined with Lego NXT. Linköping University's Laboratory of Organic Electronics, in Sweden, led by Magnus Berggren, have built an electronic circuit using a rose. They used a conductive liquid polymer that was able to move through the rose, hardwiring the vascular system.

There are also robots that move your pot plants around the house to stay in the light (avoiding the shadows) that are called Inda-plants or faunaborgs, created at Rutgers University – where sensors alert the bots to shadow. Exactly like plants, these little faunaborgs shy away from the shade, appearing to move towards the light.

Artist Gilberto Esparza has worked with robots for several years. In Mexico City, he colonised the city with urban parasites; these were robots designed to move around and search the city for energy. More recently, vegetation became his new passion once he started to think about a symbiosis between plant and robot. His robot plant hybrid, the Nomadic Plant, responds to dryness. So, when the bacteria or vegetation incorporated into the little mobile robot requires water, it moves to the closest supply of water, even contaminated sources, to suck up water to feed its plant. The poor quality water is filtered—or rather the bad microbial cells are decomposed—and turned into energy. Then there's more power to move the plant when it next needs water. This robot enables plants to survive in an environment that humans have damaged. These robots are helping to minimise the negative environmental effects humans have had on the planet.

If our environment and its rising temperatures, carbon emissions, drought/bushfire and water shortage issues are a consequence of human-centred lack of care for the natural resources of the world, then has the tipping point already passed? Is Aaron Hirsh right in thinking humanity has a fateful inclination to experience an evolutionary decline, precisely because it wasn't able to take its apical place in the food chain? Whether or not ecodemise was caused by human hubris or human irrelevance, the point remains that we live on a 'hothouse earth', a place of unstoppable climate change. Where is the repair? Take Esparza's creation, which

¹ For this work and other examples of human-computer interaction biosensing, see <https://bit.ly/36spCkW>

is designed to be a multi-legged, autonomous robot powered by the microbial fuel cell. The spidery legs creep across the ground to locate water. Its movement is a curious point for those of us interested in plant philosophy or nature philosophy. Two of the key reasons that plants have long been relegated to the background by humans as less relevant are their inability to move or think (Marder 2013). This robot solves the immobility issue by ambulating on behalf of the plant. It's important to remember, though, that plants have their own particular mobility. Seeds travel many kilometres in the wind. Roots spread through the soil for miles and miles. There is constant movement within the frame of the plants: water and nutrients move through the vascular systems, photosynthesis making an active movement from sun to green, in one admirable process. While it is acceptable to say that plants have specific nonhuman movement, it is still interesting to see how a robot might solve the existential problem that humans have always attributed to the unwitting plant: immobility. So how does the Nomadic Plant access the water? The sensors alert the bot to move towards water. The robotic arm sucks water through a tube and converts it to energy (electricity), with part of the water feeding the onboard plants. The robot's clumsy movements create a sense of sympathy.

Another example of robotany are the robotic systems created to grow like plants. The robot built by Barbara Mazzolai at the Italian Institute of Technology, Genoa, mimics the behaviour of real plants. This system has roots like real plants and, just like the real ones, it knows if or when the water, temperature or pH are off balance. The roots of these robot plants grow underground, and they do so by prioritising the environmental stimuli. Mazzolai's team first had to create a mechanism to mimic digging into the soil, as roots do. Nature adds material as it grows. The researchers fed the robot these artificial filaments so it could elongate itself to penetrate the soil. Real roots learn to bend away from heavy metals and other roots. A cautionary word might be that if we search for the 'strange and wondrous other', that is, the inaccessible and unknowable inner plant, there is a risk that we do no more than exoticize nature, that we

forget we are writing alongside nature rather than on its behalf, and that we search for queer elements of plant life to make visible difference, rather than learning from plant structures or radically rethinking our relationship with plant life.

THE CASE STUDIES AND TIPPING POINTS: THE PLANT-ART APPROACH

This leads to the necessity of developing art and design responses to the inability to see plants as an effort of repair. Russian artist Olga Kisseleva's *EDEN—Ethical Durable Ecology Nature* (2012) project tells the story of how nature needs to be protected and this is done through biotechnology or robotany. *EDEN* is a series of regeneration projects that Kisseleva understands as listening to the plant world as a living metaphor of biological systems or networks.

EDEN was originally started in response to the local attraction, in the French city of Biscarrosse, of a centuries-old elm. According to Kisseleva, the tree died of graphiosis fungus. The city hall invited the artist Olga Kisseleva to create a monument artwork and she spent the entire project budget on arboreal research. Plant genetics researchers crossed a Siberian elm (resistant to the graphiosis fungus that specially attacks elm trees) with their local French elm. An aluminium crown sculpture formed part of the response and referred to the associations between art and biogenetics.

A second work that formed the ongoing *EDEN* 2012-15 project involved persimmon trees in Israel and Jordan using telecommunications and digital art. Kisseleva recorded the tree's noise and smell emissions—for example, sap and root—and transformed them into signals that were translated into French, Hebrew and Arabic words. The investigation sought to find out what common words might exist across the borders for water or light. By 2018 the artist had developed this tree communication project as part of the Echigo-Tsumari Triennale in Japan. In this work she linked a cedar tree in Paris, situated between the Fondation Cartier and Boulevard Raspail, and a Wollemi Pine in Australia, with a local Japanese cedar. Signals emitted from each tree were translated into sound and images, and each



were filmed by webcams and all three trees could be seen live at the Echigo-Tsumari exhibition event.

Art's attempts to narrate and translate the inner life of plants suffer the same obstacles and challenges that face narrative and creative writing. Kisseleva's efforts are to aestheticize the mechanical processes of plant or tree life by recording their emissions, using software to create sounds from those activities and then translate the sound into words. This reflects the human desire to access the plant's inner workings and to participate on an equal footing. It is sometimes an unquenchable desire to connect, to communicate and to be enhanced by a deeper relationship with the natural world. There is no doubt this is a widespread desire, but the measure of its success has not been recorded or analysed, unless you consider this paper a form of impact.

The problem of communicating between

species, across nonhuman to human (by human for human), is that it is a one-sided conversation. The problem with translating between species is that permission has not been sought. In terms of creating a vegetal or plant aesthetic, it is difficult to move outside the conventional modes of representing plants as static and flat, and without agency and independence. The question to ask is whether the intention and the resolve—the spirit of goodwill towards plant life—is enough. Kisseleva's passion for trees and for restoration and care of old trees and wider heritage forests is clear. She does not suffer 'plant blindness' but perhaps her work moves towards a type of repair.

The relationship between Kisseleva's telecommunication, digital art and the trees from her project fulfils our definition of 'robotany', being the connections between plants and technology. The artist uses the technology to better communicate and represent the latest

■ Setup of Geomerc, with three hydroponic units connected to the plotters through the central processor, 2015. Photo Matteo Cremonini.

plant science about plant communication. For instance, Richard Karban has identified that a species of sagebrush is able to identify volatile communication cues to ascertain that genetically similar plants were at risk, which leads to suggestions of kin recognition (Karbon and Orrock 2018). This kind of discovery has increased arts' and humanities' interest in the hidden lives of plants, because there is scientific evidence for what many people instinctively suspected – that the hidden or unseeable lives of plants are a source of human fascination.

THE PLANT-DESIGN APPROACH

The machinations of design are important to a discussion of botany. Where art is concerned with creating an aesthetic of plant thinking and behaviour, design is concerned with both the process of design thinking (or procedure) and the designed outcomes. Here, we are connecting with information design because there are techniques of recording data and collating information at the crossover of plants, technology and future thinking or plant-oriented futures. Information from plant activities can be recorded and analysed according to big data and connected data in other fields.

The designer we are discussing here is Gionata Gatto, an Italian designer living in the Netherlands. Gatto's partnership with industry and his efforts to both represent and express data and real-time plant processes exist within a structure of climate science. A tipping point refers to a critical threshold at which a tiny change can alter the state of an entire system (Lenton 2008). Early warnings can help humans guess how close these tipping points might be. Art and design can also be early warnings... for humans, with humans, by humans... by expressing the precarities of our future world. For instance, the Amazon forest is at a tipping point due to the impact of decreased rainfall, less biodiversity and bushfires. Ocean anoxia (lack of oxygen) is at a tipping point due to marine mass extinction. The arctic ozone is at tipping point due to increased UV at the surface. By chaos, I refer to rising sea levels, dangerous tides, rising temperatures, reduced biodiversity, habitat loss, ongoing drought and the associated

social and political issues humankind face as the result.

Gatto's *Geomerce* 2015 (designed in collaboration with Giovanni Innella) is a design work and installation that responds to plant accumulators that can retrieve metals from the soil, and it also draws attention to those same metals having financial value. Many of the metals associated with Gatto's concept are listed on international markets like the London Metal Exchange, thereby suggesting that the fields and crops involved in Gatto's phytomining are considered financial assets. Agriculture is at a tipping point, its impact is the over-abundance of heavy metals in the soil due to erosion, over-grazing and also the overuse of chemical fertilizers. Yet, those same agricultural pastures have new value as capital assets.

The exciting aspect of Gatto's references to phytomining is that the tipping point has been reversed in his *Geomerce* example. Gatto refers to a plot of land that was polluted by a neighbouring factory. The run-off from the factory meant that the plot of land was highly toxic with heavy metals. When locals planted high accumulator crops, the land was phytoremediated (LeBlanc 1993). In a little mining town outside Montpellier, France, according to LeBlanc, hyper accumulators such as candytuft, cabbage and rape seed are in evidence. Reversing the tipping point is only a small story, however, and not to be overemphasized because as soon as we put the brakes on our global fear of extinction, we slip back into 'plant blindness', inaction and solastalgic paralysis.

CONCLUSION

In Australia, too, we would benefit from a closer understanding of vegetal life by attending to climate extinctions. Here, too, we have the chance to live as people with plants as persons (Matthew Hall) and therefore by according equal philosophical registers and equal nature rights to all beings. This requires, as Deborah Bird Rose calls for, a recuperation project where people 'make the shifts towards connection with and commitment to the nonhuman world' (Rose 2004). To the nonhuman world of vegetal life

of earth and mountain, I would add nonhuman elements such as the botany examples discussed. These are synergistic approaches to repair—the technology of future vegetal worlds.

Artists and designers may draw attention to critical plant studies' issues of 'plant blindness'. They may raise public awareness about the important behaviours of plants and technology. They may even educate art and design lovers about the capacities of the vegetal world. If art and design move those humanities discipline areas toward a repair of 'plant blindness', then they have served as mediators of difficult issues. The condition of 'plant blindness' suggests a need for repair, but the effects of the arts are notoriously difficult to measure in terms of changes in perception, such as whether the problem has been repaired. If those of us who suffer 'plant blindness' were to be cured or repaired, there is one more frightening question – did it make any difference to our vegetal realms, our at-risk ecologies, our near-extinct plant species? My fear is that we, in the field of critical plant studies, are so busy repairing 'plant blindness' that we have yet again fallen into an anthropocentric trap – a never-ending gyre of fateful human decline via ecological disregard.

REFERENCES

- Allen, William (2003) 'Plant Blindness', *BioScience: American Institute of Biological Sciences* 53(10), <https://bit.ly/35iOpHH>, accessed 18 November 2019.
- Balding, Mung and Williams, Kathryn (2016) 'Plant blindness and the implications for plant conservation', *Conservation Biology* 30(6): 1192–99.
- Gagliano, Monica ed. (2017) *The Language of Plants*, Minneapolis: Minnesota Press.
- Gibson, Prudence (2018) *The Plant Contract*, Boston: Brill.
- Gibson, P. and James, S. (2019) 'Lantana at gloaming: Writing the plant' *Evental Aesthetics* 8(1): 39–54.
- Hirsh, Aaron (2020) 'The human error Darwin inspired', *Nautilus* 90, 30 September, <https://bit.ly/3HgXBcQ>, accessed 1 October 2020.
- Karbon, Richard, and Orrock, John (2018) 'A judgment and decision-making model for plant behavior', *Ecology* 99(9): 1909–19.
- Karbon, Richard and Shiojiri, Kaori (2009) 'Self-recognition affects plant communication and defense', *Ecology Letters*, DOI: 10.1111/j.1461-0248.2009.01313.x, accessed 3 August 2020.
- Leblanc, Marc (1999) 'The phytomining and environmental significance of hyperaccumulation of thallium by *Iberis intermedia* from Southern France', *Economic Geology* 94:

109–114.

- Legler, Gretchen (1997) 'Ecofeminist literary criticism', in Karen Warren (ed.) *Ecofeminism: Women, culture, nature*, Bloomington: Indiana University Press, pp. 227–38.
- Lejeune, Philippe (1989) *On Autobiography*, trans. Katherine Leary, Minneapolis: University of Minnesota Press.
- Lenton, Timothy, Held, Hermann, Kriegler, Elmar, Hall, Jim W., Lucht, Wolfgang, Rahmstorf, Stefan and Schellnhuber, Hans Joachim (2008) 'Tipping Points in the Earth's Climate System', *PNAS* 105(6): 1786–93.
- Marder, Michael (2013) *Plant Thinking: A philosophy of vegetal life*, New York: Columbia.
- McShea, Patrick (2019) 'Plant Blindness', Carnegie Museum of Natural History, <https://carnegiemn.org/plant-blindness/>, accessed 18 November 2020.
- Plumwood, Val (1997) 'Androcentrism and anthropocentrism: Parallels and politics', in Karen Warren (ed.) *Eco feminism: Women, Culture, Nature*, Bloomington: Indiana University Press, pp. 327–55.
- Rigby, Kate (2009) 'Writing in the Anthropocene: Idle chatter or ecophoretic witness', *Australian Humanities Review* 47: 1–9.
- Rose, Deborah Bird (2004) *Reports from a Wild Country: Ethics for Decolonisation*, Sydney: UNSW Press.
- Schellnhuber, H. J. (2008) 'Tipping elements in the Earth's climate system', *PNAS* 105(6): 1786–93.
- Steffen, Will, Rockström, Johan, Richardson, Katherine, Lenton, Timothy M., Folke, Carl, Liverman, Diana, Summerhayes, Colin P., Barnosky, Anthony D., Cornell, Sarah E., Crucifix, Michel, Donges, Jonathan F., Fetzer, Ingo, Lade, Steven J., Scheffer, Marten, Winkelmann, Ricarda and Schellnhuber, Hans Joachim (2018) 'Trajectories of the Earth System in the Anthropocene', *PNAS* 115 (35): 8252–59.
- Summerell, Brett (2019) 'How to save the planet? Overcome plant blindness', *The Sydney Morning Herald*, 5 October, <https://bit.ly/35Nrrbn>, accessed 16 June 2020.
- Vieira, Patricia (2015) 'Phytographia: Literature as plant writing', *Environmental Philosophy* 12(2): 205–220.
- Wandersee, James and Schussler, Elizabeth (2001) 'Toward a theory of plant blindness', *Plant Science* 47(1): 1–9.