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EDITORIAL

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Standing in the shadows of plants

1 | INTRODUCTION

> "Ensnared with flowers, I fall on grass"
> Andrew Marvell, 1681

Plants permeate human life. Our physical and cultural environments are infused with the lives of plants. Even the oxygen in the air we breathe is the result of their biological processes. Indeed, "we rely on plants for food, shelter, fuel, and fibers for clothing, as well as for our gardens, landscape, and artistic inspiration" (Hiscock, Wilkin, Lennon, & Young, 2019). And yet, many of us struggle to even notice their existence, a phenomenon described as "plant blindness" (Halpin & Mckim, 2019; Wandersee & Schussler, 1999; 2001a).

In the late twentieth century, two American biologist educators, Wandersee and Schussler, provoked an important debate with their theory of "plant blindness". Twenty years on, further work is required on the challenges they set society (Balding & Williams, 2016; Ro, 2019). For instance, in the face of climate change, diminishing biodiversity and increasing extinction (IPBES Global Assessment Report, 2019), humans need not only to notice plants in their daily lives, but also to engage more deeply with understanding their "plantiness—the set of characteristics and capacities specific to plants" (Fleming, 2017, p. 27).

This special issue of *Plants*, *People*, *Planet* brings together a wide range of perspectives on the topic of "plant blindness"—the widest to date in one issue—with contributions from scholars working across a diverse range of disciplines, from the humanities and social sciences to plant science, conservation, and ecology. We also take this opportunity to showcase the work of visual artists working at the interface of art and plant science, and educators who use plants as a key subject in their education practice. The geographical reach of the contributions is also extensive with contributions from around the globe and the Twittersphere!

We acknowledge that even the much-used term "plant blindness" can, in itself, be considered to be problematic in that it equates the non-visibility of plants to the multifaceted state of being blind, albeit its original use by Wandersee and Schussler was considered to be metaphorical (Wandersee & Schussler, 1999; 2001a). Consequently, the term can be construed to function as a deficit model and possibly perceived as ableist (MacKenzie & Kuebbing et al., 2019; in this issue, pp. 139). Furthermore, some commentators have presented "plant blindness" as a medical model that needs a cure. We use this term in the context of the original piece by Wandersee and Schussler with the aim of bringing together a collection that goes "beyond plant blindness", as outlined below.

1.1 | The "Green Stuff"

Various authors have described human perceptions of plants in the modern world as the "green stuff you ordinarily ignore" (Vogel, 2012, p. 1); "the mute, immobile furniture of our world" (Mancuso & Viola, 2015, p. xi); and even "screens for our self-image" (Marder, 2016, p. 25). Ironically, Marder's statement has come to fruition in an age where "the selfie" photograph has an increasing role in social relations between humans and their environment (Weilenmann & Hillman, 2019), sometimes to the detriment of plants; see for example the news story "#Superbloom or #poppynightmare? Selfie chaos forces canyon closure." (Gammon, 2019).

Biology students, such as Ben Furness, admit that "when I walk to the bus stop, I don't pay attention to the trees I am passing. As a biology student, I am concerned with plants a lot, but in my daily life—like most people—I barely notice them" (Furness, 2019). This "not noticing" has inspired him to consider plants through drawing and through filmmaking (see, https://www.youtube.com/watch?v=-SuTkgcFjOWw). Drawing is also an activity discussed in our interview with Maura Flannery, a university biology educator, who uses it to engage her students with plants (Flannery, 2019; in this issue, pp. 150). In this complex assemblage of plants and people, viewing plants in their wider ecological contexts has become increasingly difficult; as Susan E. Yoder has recently observed: "we are living in a moment of great paradox. Plants are everywhere. Yet plants are nowhere" (Drotleff, 2018).

1.2 | Cultural botany

One critical reflection on debates concerning humans perceiving plants is the danger of assuming "everyone is just like us" (Knapp, 2019; in this issue, pp. 164) when it comes to developing an all-encompassing theory of "plant blindness". In the seminal work, *Plants as Persons: A philosophical botany* Hall recognises the importance of diverse cultural relationships with plants and asks us to move beyond physiological limitations into philosophy. In addition, he asserts the importance of indigenous plant-based knowledge (e.g. as medicines and food) in the face of "plant blindness" (Hall, 2011). Such relationships not only concern inter-cultural differences, but also intra-cultural differences, as in, for example, those between grandparent and grandchild concerning memories of views of wild-flowers in a local field, long since built upon, eloquently described by Challenger: "Her

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memories overlay the landscape, haunting it with things I could not see or understand" (2011, p. 29).

Being in gardens can show us myriad ways of seeing plants, their histories and possible futures (Kincaid, 2000; Sandilands, 2018). Sandilands sees her garden as "a barometer for climate change" and considers the *Clematis jackmanii* as representing both a colonialist history and horticultural capitalism. She laments the loss of floral diversity caused by inbreeding in a limited number of cultivars and wonders if the "favouring of these cultivars by gardeners and industry means that less attention is paid to species that invite different kinds of relationship" (Sandilands, 2018). Plants classified as "weeds" would be such an example, as Kopnina has observed: "Plants in general and urban greenery in particular in developed industrial societies have become subjectified to cultivation, grooming, trimming of plants that are considered 'good' and eradication of plants that are considered 'bad' (2013, p. 12)". This is exemplified in the recent case of Sheffield Council, UK, removing mature street trees without due consultation with communities, as noted in this news report: "Trees matter to the planet and they matter to communities" (Streets Ahead, 2018).

Kincaid, as a woman of Antiguan–American descent, reflects on her thoughts walking through a botanical garden: "This is the backyard of someone else, someone far away, someone's landscape" (Kincaid, 2000, p. 110) and thus highlights the translocation of place and colonialism inherent in botanic garden collections. Categorisations of plants as "weeds" and long-term human relationships with edible plants, such as rice, are in focus in the film work of Ellie Kyungran Heo (https://www.elliekyungran.com/). In using well-placed heightened sound and silent spaces her work brings our attention to how humans emplace, and replace, plants in their lives. In her ongoing series "*Plantarians*" we see gardeners at work, including the visceral removal of some "weeds". In "*Did You Eat Rice*" (2017) the cultural meaning of growing, harvesting, cooking, and eating rice is brought to the audience's attention. Mirroring elements of Heo's film-work, Scherer considers her art works to be about nature and humankind's attempts to control it (Scherer, 2019; in this issue, pp. 142). Law, discusses the importance of narrative:

> "My creative process allows me intimate access to, and connection with, botanical subjects. I enjoy creating narratives about the co-relation between beauty of nature and well-being through my work" (Law, 2019; in this issue, pp. 146).

In 2018, the art gallery Tate Britain held an exhibition entitled "*All Too Human*" the exhibition explored "how artists in Britain have stretched the possibilities of paint in order to capture life around them" (Tate Britain, 2018). One painting selected for the show stood out in its absence of a human subject: "*Two Plants*" (1977–1980) by Lucian Freud (Figure 1). Freud had included plants as subjects since 1951, for example in his painting "*Interior in Paddington*" (Aloi, 2017). In the context of plant invisibility, two aspects of "*Two Plants*" and Freud's relationship to it are pertinent. Firstly, Freud defined the painting as, "lots of little portraits of leaves… I wanted it to have a really biological feeling of things growing and fading and leaves coming up and others dying". Secondly, the portrayed plants struggled to stay alive during the 3 years the painting took to complete, and thus their detailed portraits were brought to human attention under physical duress (Tate Gallery, 2019). The curatorial decision to include them in a large show, mainly focused on human subjectivity is an interesting one, as it connects closely observed botanical complexity with qualities of intimate human portraiture, and critically, does not attempt to replace faces with flowers but instead portrays leaves, thus revealing a significant organ of "plantiness" (see for example Farmer, 2014; Lee, 2017; Vogel, 2012). Indeed, Aloi has argued for more academic attention to Freud's painting of plants in the context of plant studies (Aloi, 2017) and asks how might art enable new ways of seeing plants?

Artists, such as Snæbjörnsdóttir & Wilson take a biographical approach to inform their art-based research of seeds, their adult forms, and their human collector (Joy, 2009). In so doing they foreground a narrative often absent from human engagement with the seed-bearing plant's life cycle- the seed itself, enlarged through Scanning Electron Microscope (SEM) technology and carefully coloured in association with periods of long observation of their complex surfaces (Figure 2). The adult plant portrait recedes into



FIGURE 1 "*Two plants*" (1977–80) by Lucian Freud (1922–2011). Image: ©The Lucian Freud Archive/Bridgeman Images. Photograph: ©Tate, London 2019

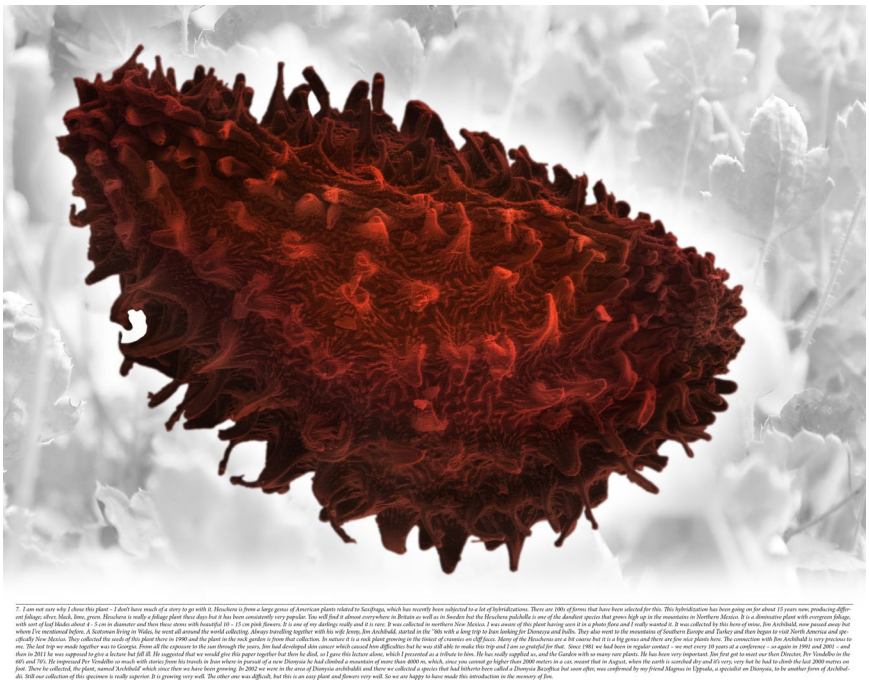


FIGURE 2 "*Heuchera*" (2017) by Bryndís Snæbjörnsdóttir & Mark Wilson. Photograph: ©Snaebjörnsdóttir/Wilson

a monochrome background and the human collector becomes a scientific footnote. Thus we, the human onlookers, are confronted with the presence of the enlarged seed in all its structural complexity and aesthetic beauty.

It is not just modern art-based research that offers a doorway into "plantiness"; many earlier painters present a rich library of images we can bring to human–plant experiences; for example, the Durer painting "*Das Grosse Rasenstuck*" used to illustrate Grass Blindness in Thomas (2019; in this issue, pp. 197). This is a painting, in which the artist "takes a worm's eye view, showing his plants almost life-size". He brings the details of each individual plant to the human viewer (Pavord, 2005, p. 140).

These artists, writers, and filmmakers draw our attention to an important question, how do place and plants figure in the human imagination when we are living in a world, in which human-related activities are often trans-global? Where might plant symbolism, human narratives and representations sit in these complex socio-cultural spaces? These questions inform the work of Sachdev (2019; in this issue, pp. 271) and Aloi (2019; in this issue, pp. 204) when they consider plants, and their representations, in two diverse contexts rooted in cultural and political symbolism.

In the light of the ecological challenges facing 21st century Earth, this issue of *Plants*, *People*, *Planet* represents a collection of peer-reviewed cross-disciplinary papers on "plant blindness" seen through a variety of international perspectives. They both provoke and answer questions concerned with how humans relate to plants. As the philosopher Kierkegaard writes in *Either/Or*; "I cannot see the grass grow, but since I cannot I don't feel at all inclined to" (Kierkegaard cited in Marder, 1992). Thus, our examinations of "plant blindness" go beyond the act of sensory comprehension and the communication of plant science and extend into cultural representations; for this is the complexity of the plant/human/planet relationship.

2 | PLANTS ARE NOT THE BACKGROUND

Part of the challenge of seeing plants originates from their "perceived otherness" (Sanders & Jenkins, 2018), and, as Van Volkenburgh has observed:

> "They are slow: usually they look today just like they did yesterday and we have to wait, sometimes a long time, to see changes in them" (Koller, 2011, p. xiii).

But, what if the "life in the slow lane" image of plants is a stereotypical characteristic that we humans have placed onto plants? And what if it is human perception, not the plant that is "trapped in time" (Sanders, 2019)? Perhaps a wider repertoire of stories is needed to draw on when endearing human attention to "Life as Plant"? In plant science, the contribution of very-high-resolution time-lapse photography for plant and ecosystems research has been recognized (Nichols, Steven, Sargent, Dille, & Schapiro, 2013). Can art play a role in these botanical conversations and "translate the world of science" as suggested by Scherer? (Scherer, 2019). But is it merely a case of translation or the deeper contribution that interdisciplinary perspectives might offer, as Vieira, Gagliano, and Ryan (2016) have proposed.

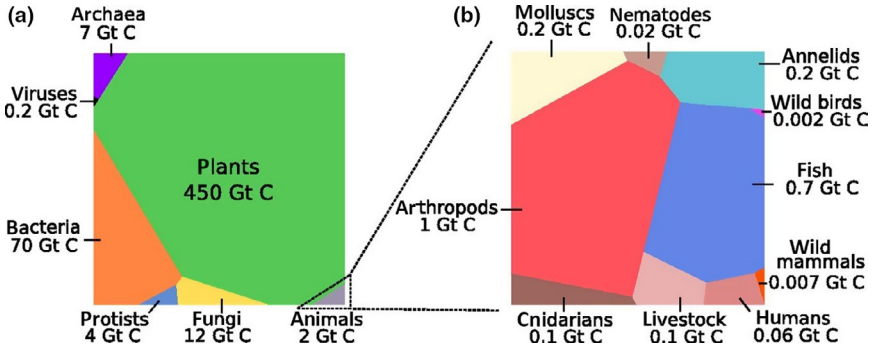


FIGURE 3 "Graphical representation of the global biomass distribution by taxa" from Bar-On et al., 2018. (a) Plants with circa 450 gigatons of carbon (Gt C) are by far the most dominant Kingdom of life; (b) animal taxa in comparison comprise circa 2 Gt C

In contemporary contexts, plants are often ensnared, as multiple actors, in complex political formations between humans and the wider environment: the production of palm oil being a good example (Orsato, Stewart, & Falcão, 2013). The oil is produced from cultivated palms that replace diverse, intricate natural forests in countries like Borneo in which:

> "Deforestation has significantly reduced the only habitat of the orang-utan and other species, such as the pygmy elephant, clouded leopard, Sumatran rhino and other lesser known animals, as well as thousands of species of plants, which may disappear altogether within the next 20 years. The remaining forests are under extreme threat" (Orsato et al., 2013, p. 445).

Consequently, as we move through Earth's history, to an era in which species extinction is extensive (IPBES Global Assessment, 2019; Willis, 2017), the gathering of plant stories from different perspectives has become ever more critical. Accordingly, humans need to consciously reframe plants beyond the status of silent witness to environmental change or as a commodified object of which we "barely speak", and instead consider them as fundamental historical narratives. Plants are some of our planet's longest-lived species and many of their leaves "have imposed upon the vast majority of living beings a unique environment: the atmosphere" (Beerling, 2007; Coccia, 2019, p. 26; Orsato et al., 2013; Thomas, 2013).

Despite the lack of human focus on plant populations, their biomass constitutes a substantial percentage of Earth's terrestrial biodiversity, as represented in the recent paper by Bar-On, Phillips, and Milo (2018, p. 6506): "We find that the kingdoms of life concentrate at different locations on the planet; plants (≈450 Gt C, the dominant kingdom) are primarily terrestrial" (Figure 3).

In terms of weight comparison, human beings, as shown by Bar-On et al, are insignificant; it is the plant kingdom that dominates: if "the tower of life were an office block plants would be the main tenants taking up dozens of floors" (https://t.co/aryW2STvbC). Humans are 0.01% of Earth's biomass and yet "the impact of human civilization on global biomass has not been limited to mammals but has also profoundly reshaped the total quantity of carbon sequestered by plants". (Bar-On et al., 2018, p. 6508). Thus, "seeing plants" in the world includes recognition of the critical ecological functions they support (Hiscock et al., 2019) through their diversity and biomass and, importantly, their role in our survival; for it appears that even in representations of the deep geological past, plants have barely been covered, as Vujaković demonstrates, where he argues for a more "phytocentric" representation of Earth's history (2019; in this issue, pp. 188).

Life on contemporary Earth is becoming louder and brighter. Noise and light pollution from urban-dwelling humans is increasingly impacting on biodiversity and these impacts are set to intensify as urban development increases (Newport, Shorthouse, & Manning, 2014). In this loud, bright world, plants struggle to gain recognition. What is more, they are disappearing at alarming rates as a recent study has made clear:

> "Scientists at the Royal Botanic Gardens, Kew, and Stockholm University found that 571 plant species had disappeared in the last two and a half centuries, a number that is more than twice the number of birds, mammals and amphibians recorded as extinct (a combined total of 217 species)" (Briggs, 2019).

Notably, the study authors recommend that we "teach our children to see and recognise local plants" (Humphreys, Govaerts, Ficinski, Lughadha, & Vorontsova, 2019).

3 | THE UTILITY TRAP

The "usefulness" of plants to humans has added to the pressures on their existence: The bio-cultural spaces plants occupy in the modern world, whether circulated as amputated parts for human consumption, destabilized by climate change or demolished for political expediency when they become old and too expensive to maintain, are highly complex cross-species entanglements (Sanders, unpublished). It has been said that human utility and usefulness could be identified as an educational portal into our species' perceptions of plants, however, as Pany et al. (2019; in this issue, pp. 261) have found:

> "Our results imply that for successfully building upon the basis of individual interest, it is indispensable to give the pre-existing individual interests space and time to get 'actualised' in the context of the teaching unit. This means, students with high individual interest must first get the opportunity to follow their own 'curiosity-questions'"

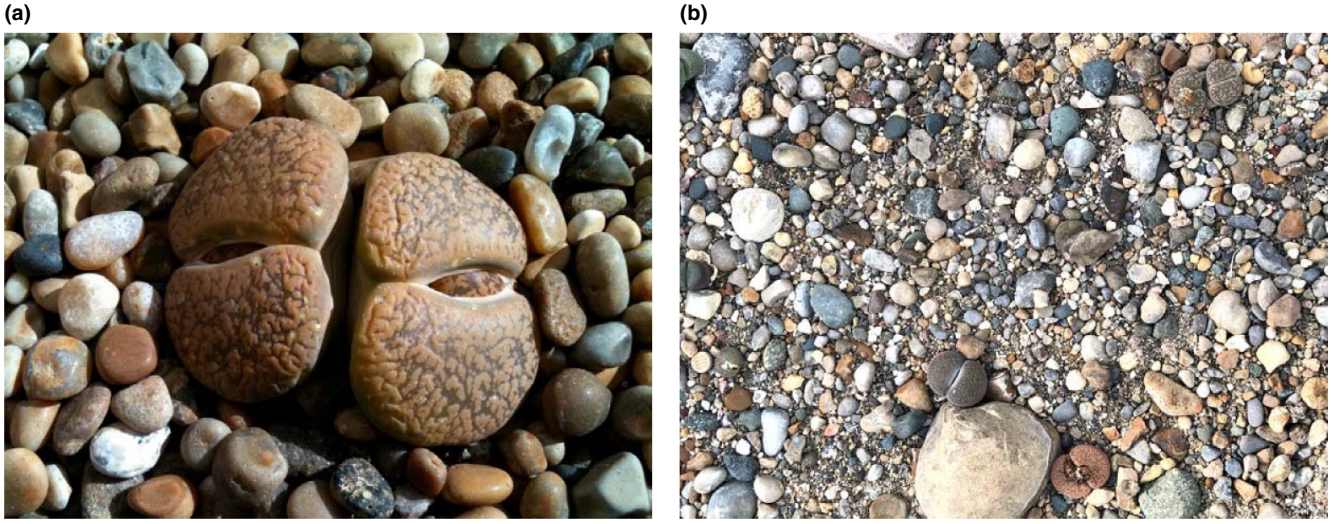


FIGURE 4 *Lithops*, also known as pebble plants and living stones. (a) A close-up photograph of *Lithops* at The Gothenburg Botanical Garden, Sweden; (b) there are five well-camouflaged *Lithops* in this photograph taken at The University of Michigan Matthaei Botanical Gardens, USA. To identify the plants please see the following tweet and accompanying thread https://twitter.com/BeckyTonietto/status/1089226357421338625. Photographs (a) Dawn L.Sanders; (b) Rebecca K. Tonietto

Thus, they suggest we should not assume that students' interests will be provoked by topics such as spice plants and herbal stimulants. In addition, Knapp warns us against "focusing our attention on plants that are useful to us today" as, she argues, this "lures us into a utility trap" (Knapp, 2019) which can "place the wildness of Earth inside the garden of human concerns", and thus imprisons the more-than-human world in justifications that adhere to "the old presumption that landscapes exist for our sakes" (Challenger, 2011, pp. 299–300). Therefore, a fine line needs to be taken between perceptions of human usefulness and the vibrant agency of "plantiness" (Bennett, 2010). Debates such as these demonstrate that certain groups of plants appear to struggle more than others to gain presence and value in human perceptions, as Thomas (2019) notes in his article: "Some plants are born invisible, some achieve invisibility, and some have invisibility thrust upon them." Grasses are a case in point for the latter as they hide in plain sight. Grass is there in sports surfaces, gardens, pastures, paddocks, rural landscapes, savannahs, prairies, and steppes, but usually as a background for other more interesting (to humans at least) objects, events, and experiences.

Likewise, *how* plants are foregrounded in contexts such as science centres and botanical gardens, especially when presented alongside animals, impacts on their human spectators' views of plants (Nyberg, Hipkiss, & Sanders, 2019; in this issue, pp. 212).

4 | MAKING PLANTS PUBLIC: MARQUEE PLANTS

Wandersee and Schussler first published their emergent theory of "plant blindness" as a conference poster in 1998. This was followed by an article in *American Biology Teacher*, and in 2001 a further development of their work—"*Toward a theory of plant blindness*"—was published in a plant science journal (Wandersee & Schussler, 1999; 2001a). In essence their theory draws on visual cognition work, specifically human abilities to perceive plants; they consider part of this perceptual inability to be a "visibility bias" (2001a). Alongside their theory of "plant blindness" Wandersee and Schussler offer a counterpoint model: "Marquee Plants"- based on the American word for the large letters outside cinemas and theatres advertising films and plays. In their conference paper, *Plants That Draw a Crowd: An Analysis of the Visual Characteristics of Six Unusual Plants Featured at Botanic Gardens* they suggest three factors in becoming a "marquee plant":

- Plant species that attract the public's attention
- A plant species that, during some or all of its life cycle, is capable of drawing a crowd at a botanic garden
- A plant species that may serve as a portal to public understanding of plants (Wandersee & Schussler, 2001b, p. 3).

Interestingly, of the six "unusual plants" featured in their list, one is a) very small and b) uses camouflage to look *less* plant-like—*Lithops lithops*—"the stone plants" (Figure 4).

In relation to Wandersee and Schussler's theory "plant blindness", it is significant that this part of their work has been under-utilised in bringing public attention to plants. Perhaps, because, as Gibson (2018, p. 1) suggests: "Humans will always see the bear not the woods, the lion not the grasslands, the camel not the desert dunes. We are attuned to see animals, and to see ourselves". This statement, and Wandersee and Schussler's work on human plant vision, provides us with a reason for *not* seeing plants but fails to offer a much-needed recalibration and widening of our sensory awareness. Furthermore, in our human engagement with this difference it is important that we do not seek to subject plants to "terms of resemblance", anchored by "the human" Houle (2011, p. 95) but rather to engage with their "plantiness" (Fleming, 2017).

Critically, in the context of education, Balas and Momsen (2014) have argued the case for moving away from focusing on students' perceptual bias, and instead reflecting on learning opportunities that "compensate for and overcome their perceptual limitations" (p. 442). In their work on countering "plant blindness" Wandersee and Schussler (2001a, p. 6) found the powerful potential in human "plant mentors" bringing plants to children's attention: "early experiences in growing plants under the guidance of a knowledgeable and friendly adult was a good predictor of later attention to, interest in, and scientific understanding of plants."

In this issue, Hartman et al. and Lampert et al. demonstrate the effectiveness of testing ideas concerning *how* we bring plants to student attention, whether these ideas and activities involve higher education biology students (Hartman, Lydon, & Rasmussen, 2019; in this issue, pp. 233) or science education secondary students (Lampert, Scheuch, Pany, Müllner, & Kiehn, 2019; in this issue, pp. 248). Notably, Hartman et al's contribution can be summarized by one of their published student quotes:

> "It was a great change of pace to be outside, looking at real things and applying theory and collective knowledge! It was challenging but I also came away from the experience with a lot of knowledge cemented to tangible visual memories"

Lampert et al acknowledge, in relation to school students' knowledge of plant reproduction that their research results:

> "Show that students struggle to differentiate between pollination and seed dispersal. Moreover, students have a better knowledge about the function of seeds than about the function of pollen. Students are most familiar with seed dispersal by wind and pollination by bees."

5 | BEYOND "PLANT BLINDNESS"

Creating a more public image for "plantiness" (Fleming, 2017) is critical in an era in which "more than half of the world's human population live in urban areas" (Newport et al., 2014, p. 204), and as a result may not be exposed to plants in the same way as previous generations. Thus, we can claim, as Kopnina does, that "even as 'the human' shares the stage with 'the plant' the discussion remains anchored in human perceptions and interpretations of plants, addressing questions of relatedness, exchange, governmentality and signification" (Kopnina, 2013, p. 10), such as those of race and representation which Aloi examines (Aloi, 2019), social representation (Sachdev, 2019); illegal trade (Margulies et al., 2019; in this issue, pp. 173); food and biodiversity (Krishnan et al., 2019; in this issue. pp. 157; see also Moscoe & Hanes, 2019; in this issue. pp. 183); human relationships with forests (Häggström, 2019; in this issue, pp. 221); human recreation (Friedersdorff, Thomas, Hay, Freeth-Thomas, & Creevey, 2019; in this issue, pp. 290); the foregrounding of animals over plants (Nyberg et al., 2019); plant scientists' perceptions of plants (Jose, Wu, & Kamoun, 2019; in this issue, pp. 169); and the critical role plants play on earth (Knapp, 2019). Notably, in relation to "plant blindness" Margulies et al. (2019) suggest the following key points from their review of International Wildlife Trade Policies:

1. There is insufficient attention from funding agencies to the presence and persistence of illegal trade in plants;
2. Plant species are abundantly overlooked in International Wildlife Trade policy and research, perhaps with the exception of the illegal timber market;
3. These absences are at least in part resultant from the long-term de-privileging of plant life compared to animal life as codified in governmental laws defining the purview and meaning of "wildlife".

As noted above, perhaps, now is the time to move *beyond* the all-encompassing term "plant blindness" and associated "cures" and in so doing recognize the complexity of humanity engaging with an organism that has an entirely different body plan from us; one that privileges surface over volume (Coccia, 2019; Darley, 1990) in "order to absorb the diffuse resources necessary for their growth" (Darley, 1990, p. 354). In addition, we now know plants live in complex inter-relational communities (see for example, Karban, 2008; Gagliano & Renton, 2013) and engage in sophisticated interspecies connections (see for example Schöner et al.,). Moreover, plants are incredibly diverse in form, lifestyle, and habitat, as illustrated by the *Flora Obscura* series in *Plants, People, Planet*. This series aims to shine a spotlight on lesser-known plants and highlight new and unusual insights into plant biology, including new species. In this issue we focus on *Rhizanthella* as "unseen orchids"—a group of Australian plants that currently are the only known plants to possess underground flowers that are virtually invisible and thus unseen, and of critical conservation concern (Thorogood, Bougoure, & Hiscock, 2019; in this issue, pp. 153). As the biologist McClintock has commented, "plants are fantastically beyond our wildest expectations" (Keller, 1983, pp. 199–200).

In writing this editorial I agree with Head, Atchison, Phillips, and Buckingham (2014) when they state that: "people, plants and many others are entangled in ways that both enhance and constrain each other's lives" (p. 863). These entanglements need recognition as biological, social, sensory, scientific, cultural, physical, political, theoretical, commercial, perceptual, educational, and ecological assemblages: the complexities of which we are still exploring, as Häggström's work (2019) demonstrates. Moreover, "attending and attuning to the radical difference of plants will not only reveal our interconnectivity—it will necessarily challenge us, requiring us to ask which categories are useful and which need rethinking" (Head et al., 2014 p. 866). The role of science communication, and education, is to make plants: public, relevant,

and meaningful to modern society without removing their characteristics of "plantiness" (Jose et al., 2019). Art-based research practices can assist us to do so (Law, 2019; Scherer, 2019) and the education/art/science project: *Beyond Plant Blindness: Seeing the importance of plants for a sustainable world* in which I have been a research partner (https://snaebjornsdottirwilson.com/category/projects/beyond-plant-blindness/).

6 | BOTANICAL HORIZONS

In their concluding comments of *Toward a Theory of Plant Blindness*, Wandersee and Schussler discuss the need "to liberate American students from the intellectual, perceptual, and visual processing traps that can lead to *plant blindness"* (Wandersee & Schussler, 2001a, p. 8). In an era characterised by anthropogenic change the terms by which we define a lack of human attention to plants have, I believe, become secondary. In sharper focus are the diverse inquiry processes by which we might better comprehend, as researchers, these "botanical horizons" between human and plant/plant and human (Wandersee & Schussler, 2001a). Not least we need to understand this nexus through multiple disciplinary lenses and time-scales. For, as Vujaković (2019) makes apparent, we have always been standing in the shadows of plants.

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