Article

Listening to plants: Conversations between critical plant studies and vegetal geography

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Abstract

Attention to plant life is currently flourishing across the social sciences and humanities. This paper introduces recent work in the informal sub-discipline of 'vegetal geography', placing it into conversation with the transdisciplinary field of 'critical plant studies' [CPS], a broad framework for re-evaluating plants and human-plant interactions informed by principles of agency, ethics, cognition and language. I explore three key themes of interest to multispecies scholars looking to attend more closely to vegetal life, namely: (1) plant otherness; (2) plant ethics; (3) plant-human attunements, in the hope of encouraging greater cross-pollination between more-than-human geography and critical plant studies.

Keywords

Plants, vegetal geography, critical plant studies, more-than-human geography, plant-human relations, otherness, multispecies ethics

> Lots of people hear plants sing, though not necessarily in the audible registers you might anticipate.
>
> (Myers, 2018, p.5)

1 Introduction

What does it mean to hear a plant? When being attentive to vegetal life, we look closely, we taste, we smell, we touch; perhaps we hear the rustle of leaves in the wind or the groaning of a branch, or the rattle of seeds in a poppy head. But to hear is not just to perceive sounds through our ears. It is also to listen with attention and understanding – to 'give ear to'. As Robin Wall Kimmerer (2013) makes clear, plants may not speak our language, but their eloquence can be found in their material growth and the ways in which they live. It has been well-established that plants have long been lurking in the proverbial pavement cracks of (more-than-) human geography in favour of the animal (Atchison and Phillips, 2020; Head and Atchison, 2009; Jones and Cloke, 2002). As well as restating this call, this paper explores the recent contributions made under the loosely defined umbrella of 'vegetal geography', placing them in conversation with the blossoming interdisciplinary field of critical plant studies [CPS]. The theoretical insights provided by CPS hold much potential for

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more-than-human geographers concerned with unpicking the specificities of multispecies entanglements and listening to the planty subjects within them, whilst vegetal geographers have much to contribute in return, both methodologically and in rooting plant-theory firmly in contexts of place.

In recent decades, animal geographers have done much to challenge the ontological and epistemological underpinnings of the discipline of human geography, demanding a theoretical re-evaluation of agency and the co-production of space, what it means to be human, and the biopolitical management of life. However, interrogations of 'life' which refer only to animal bodies – whilst valuable – can only take us so far. Increasingly within emerging multispecies scholarship, the gates of 'bios' are being thrown open to all living creatures: plants, fungi, animals and microorganisms (Van Dooren et al., 2016). There are also invitations from new materialist thought, object-oriented ontology and Indigenous scholarship to consider the agency of inanimate objects – mountains, bottles and books (Bennett, 2010; Harman, 2016; TallBear, 2011). Whilst these theoretical perspectives are highly generative, there is a risk of fast-forwarding from the animal (in particular those animals most close, comfortable and charismatic) to absolute ontological entanglement with all matter, without pausing to allow fungi, bacteria, insects, or plants time to root themselves in our theoretical and ethical imaginations. The wealth of diversity within the plant kingdom demands its own theoretical approaches, allied with but not tied to those of the animal. There is value to be found in stopping to smell the roses, given that our ecological survival on this planet likely rests upon collaboration between humans and plants (Hall, 2011).

Despite the relative neglect of plants within the discipline, there are currents of lively geographical scholarship which are taking plants seriously in a wide variety of contexts including agriculture, urban space, foraging and biosecurity. Many of these approaches remain, however, somewhat fragmented. This paper explores this body of work and contributes to debates around the possible existence of a 'vegetal geography', arguing that while formal institutionalisation of the sub-discipline might be unnecessary, it may be productive for vegetal geographers to situate themselves more firmly within the broader landscape of CPS.

Critical plant studies is an interdisciplinary and umbelliferous field which sits betwixt and between the environmental humanities, plant sciences, art and aesthetics, philosophy and ethics. Emerging in the early 2010s, CPS provides a broad framework for re-evaluating plants, their representations and human-plant interactions, guided by questions of agency, ethics, cognition and language (Gagliano et al., 2017). Literature within CPS is wide-ranging, but coheres around the imperatives to carefully re-assess the specificities of plant behaviour and assert the centrality of plants to human life and thought.

Some 'vegetal geographers' have already been actively engaging with and contributing to CPS (see Ginn, 2016; Head et al., 2014, 2015; Pitt, 2018), and many more have been inspired by the work of these geographers, but there is potential for greater cross-pollination between the two fields. After introducing vegetal geography and CPS, I explore three critical themes from within the literature. Plants pose a challenge to western animal-centred ontologies, their 'otherness' prompting a redefinition of certain terms and concepts as explored in Section IV, which focuses on navigating the tensions in tracing similarities/differences across kingdoms. Section V steps back to consider the ethical standing of plants and the implications in terms of diet, racial capitalism and nonhuman labour, asking how questions of human justice might be balanced with a plant, multispecies, or 'multi-elemental' ethics. Finally, Section VI unites theory with practice in elaborating on a variety of attunements to plant-life deployed within CPS and vegetal geography, from experimentation with art and film to archival and participatory research. Whilst not exhaustive, these three areas will, I hope, introduce ongoing debates and lay out some of the more fruitful lines of confluence and conversation between CPS and geography. What might you hear when a plant sings?

II Vegetal Geography

Despite their central role in the founding of geography as a discipline (Carter, 1946), plants lingered chiefly in the domain of the biogeographer until the

early 2000s. Within human geography, plant bodies have been typically obscured, made invisible by their categorisation as undifferentiated collectives – as often in the case of crops – or backgrounded as environment or ecosystem (Atchison and Phillips, 2020). Plants have therefore tended to be dealt with as 'living objects' (Exner and Schützenberger, 2018) rather than active subjects, reinforcing the nature/culture divide (see Weisser, 2015, however, for an object-oriented approach to vegetal geography). In their 2009 Progress report on emerging human-plant geographies, Head and Atchison drew together material from the early 2000s which started to look more closely at plants, notably in the contexts of food, gardens and biosecurity. Since then, several noteworthy theoretical themes have emerged within the work which might loosely be grouped together under the umbrella of 'vegetal geography': plant temporality, agency, care and the everyday.

The peculiar and multiple temporalities of plants raise the question as to whether the broad classification of 'plant' even makes sense as an analytical category. Geographers have interrogated the distinctive temporalities of different plants as they shape people, place and industry, from the growth cycles of sugar cane in Barbadian breeding programs (Richardson-Ngwenya, 2012) to the dwarfed apple rootstocks in the American Midwest, manipulated to allow for flexible specialisation of variety among mid-scale growers (Legun, 2015). Vegetal time is central to exploring plant agency, determining how people inhabit landscapes with plants, for example, those with 'beyond human timescales' such as the arboreal time of sustainable guitar wood forestry in Gibson and Warren (2020) or the complex temporalities folded within the body of a seed which holds the capacity to make visible past landscapes and co-construct imagined futures within diverse communities (Cooke and Lane, 2015; Phillips, 2013; Pottinger, 2018). As explored by Pellegrini and Baudry (2014) and Ernwein (2020), the seasonality of certain perennial plants – both spontaneous and planned – can also challenge the timelessness of the city by (re)introducing a life cycle to urban spaces. Vegetal temporalities pose a significant challenge to the strictures of the industrial capitalist time-space regime, inviting us to question who (or what) we would like to keep time with (Bastian, 2012).

Vegetal time is also central to geographical conceptualisations of relational plant agency which focus on the (human) bodily attunements to plants as a means by which plant agency arises between bodies (Brice, 2014). Brice's networked approach to grape harvesting resonates in particular with geographical work on edible plants (see Lowell and Adams, 2017; Montefrio, 2020; Nyman, 2019; Poe et al., 2014). Geographers have increasingly been focussing on the specific affordances of the plants themselves as a means of tracing agency (Nally and Kearns, 2020), notably within framings of 'plant performance' in the context of weeds (see Doody et al., 2014). As pointed out by Cooke and Lane (2018), we are often more willing to ascribe agency to plants which are unwanted or exceed human control, such as the plants in their study which challenge exurban property boundaries as a 'more-than-human territorial enactment' (see also Sheridan, 2016, and Besky and Padwe, 2016 on plants, territory and borders). Much of the seminal work on plant agency within geography has drawn on empirical case studies of invasive plant species (e.g. Atchison and Head, 2013; Head et al., 2015; Patrick, 2014). Whilst invasives are excellent to think questions of agency through, allowing for the clear elucidation of plant difference, they also risk leading to narrowed conceptualisations of planty agency which are very active and antagonistic. There is a danger of obscuring the less obvious instantiations of agency by less 'disruptive' plant species, as well as drawing excessive attention to the plant actions which most closely resemble those of humans (Sandilands, 2013). It is important, then, to carefully ground conceptions of plant agency both in the shared differences of plants from other beings (as in Head et al. (2012, 2015) concept of 'plantiness') as well as in a wide variety of planty case studies which work through the enormous diversity of vegetal being.

One further theme which vegetal geographers are closely engaging with is that of affect and care, building especially on the work of Puig de la Bellacasa (2017). Choreographies of care for plants have notably been examined in agricultural contexts (Graddy-Lovelace, 2020; Head et al., 2019;

Krzywoszynska, 2015; Mincytė et al., 2020). Since care in agriculture has typically been focused on animal bodies, these accounts take up the particular challenges presented by the alterity of plants; how agricultural workers learn to be affected by plants over time (Krzywoszynska, 2015). In an ironic contradiction of industrial agriculture, these affective skills have been steadily devalued whilst simultaneously prized in new agricultural surveillance technologies developed to mimic the skills of close plant observation and care (Graddy-Lovelace, 2020). Moving out of the farm and into the garden, Hannah Pitt (2018) challenges the proposition that connecting with nature through direct encounters with nonhumans necessarily promotes ethical regard and care for them. Her proposed typology of relationships with nonhumans is then based on a sort of hierarchy of ethical regard, from enemy to-be-killed, to community member and dependent. Pitt's stance echoes that of Ginn (2014b) in his acknowledgement of the limits to care within everyday gardening practices and attention to the distance between species enacted through these spaces. There is an emphasis in these studies on affectivity and care as *learnt* capacities which must actively be cultivated through embodied encounters with plants (Jones, 2019), positioning plants both as guides and co-conspirators in spinning a vegetal ethics (Myers, 2018; Pitt, 2017).

Much of this work is therefore concerned with the mundane and the everyday, tracing close personal relationships between people and plants, notably within urban gardens (Bhatti et al., 2009; Ginn, 2014a, 2016; Hosking and Palomino-Schalscha, 2016; Lang, 2018a, 2018b; Moore et al., 2015; Shillington, 2008) and urban forests (Jones and Instone, 2016; Phillips and Atchison, 2020; Shcheglovitova, 2020). As argued by Lang (2018b), there is an environmental imperative to learn more about the experiences of people and plants in everyday life in order to connect the socio-political aspects of how people live with their broader ecological impacts, particularly within cities (see Gandy and Jasper, 2020a). Alongside the marginally more established political ecology-style approaches to plant life in geography (see Argüelles and March, 2021; Fleming, 2017), much of the work which I locate within this strand of 'vegetal geography' borrows from the environmental humanities, considering how the everyday stories we tell about plants can provide new insights into how vegetal life is experienced, imagined and valued (Phillips and Atchison, 2020). As Perkins (2011) suggests, attitudes towards plant life which may be perceived as 'common sense' are often anything but. Shcheglovitova (2020), for instance, deconstructs the city of Baltimore's presentation of urban trees as an absolute good, arguing that the uneven focus on tree planting as opposed to everyday practices of care spatially reinforces Baltimore's history of racial segregation. Geographical studies into everyday plant-human relations which pay careful attention to both the human aspects of the construction of space – race, class, gender, sexuality – as well as the nonhuman are well-placed to ground some of the more theoretical plant studies work in the real world (Davis et al., 2019).

This brief review is of course by no means exhaustive. Other important strands of vegetal geography, some of which shall be explored further below, include recent work on vegetal labour (Ernwein, 2020; Palmer, 2020), biosecurity (Barker, 2008; Barker and Francis, 2021; Tsouvalis, 2019) and Indigenous knowledge (Arnold et al., 2021; Peach et al., 2020; Robinson and Raven, 2017). The purpose of this section has been to draw together a literature which, as yet, lacks a coherent (sub)disciplinary identity. Within academic conference circuits, discussions have been occurring as to whether 'vegetal geography' ought to be more concretely institutionalised as a sub-discipline in order to assist its flourishing. On the one hand, a separate 'vegetal geography' field could be considered reflective of the restrictive projects of hierarchical classification which multispecies work tries to problematise: where might geographies of microbes or fungi sit in relation to those of animals and plants (Myles, 2019)?

It would indeed be counterintuitive for vegetal geography to take on a disciplinary structure akin to that of animal geography; taking a cue from multispecies ethnography (Kirksey and Helmreich, 2010; Ogden et al., 2013) there needs to remain a theoretical fluidity between animals, plants, humans, microbes and the abiotic world in order to reflect the complexities of our entangled relations. However, following Giraud (2019) and borrowing language from Barad (2007), we must make a 'cut' somewhere

in order to retain the ethical imperative which comes after one acknowledges entanglement. It is entirely possible to hold the radically open ontological insights of multispecies and new materialist thought together with a focus on one particular category of life. By shining a light on vegetal life, the designation of 'vegetal geography' helps to build an (inter)disciplinary community and identity which might be used as a tool of legitimacy – for early career researchers and undergraduate students in particular – to establish plants as important and viable subjects for research.

As argued by Lesley Head (2019), vegetal geography needs to be open and connected to work outside of geography in the plant sciences and beyond to ensure that our conceptualisations 'keep up with these intellectual frontiers'. To this end, there is much scope in working to establish vegetal geography more firmly as a lively contributor to CPS.

III Critical Plant Studies: A Cross-Cultural Approach

Whilst antecedents of the field can be traced from the early 2000s (e.g. Pollan, 2001; Miller, 2002), the term 'critical plant studies' emerged in the early 2010s, alongside a flourishing of interest in the metaphysical lives of plants and the diverse methodologies required to approach them (Ryan, 2011, 2012).[1] Importantly, advances in a newly developed field of plant sciences termed 'plant neurobiology' had recently recast the plant as an intelligent organism capable of coordinated response and signalling behaviours (Brenner et al., 2006); capacities brought to public attention by Michael Pollan in his 2013 New Yorker article *The Intelligent Plant*. This growing scientific appreciation of plant 'liveliness' forms a significant body of literature within CPS and has precipitated renewed interest in the ethical and philosophical position of plants (see Chamovitz, 2017; Gagliano, 2018; Simard, 2021; Trewavas, 2014; Viola and Mancuso, 2015). CPS today remains an inherently interdisciplinary project, encouraging a generative diversity of perspective; (Gagliano et al.'s 2017) edited volume *The Language of Plants: Science, Philosophy, Literature* is one of the richest collections to date to embrace this approach.

Whilst Michael Marder's (2013) work *Plant-Thinking* is often positioned as one of the key texts in this project, others such as Matt Hall (2009) and Karen Houle (2011) were already beginning to draw attention to the backgrounding of plants in Western thought. Marder (2013) traces the position of plants through western philosophy, arguing that they have been dismissed as the 'weeds of metaphysics' (p.90), planted firmly at the bottom of Aristotle's hierarchical 'chain of being', and denied meaning by Hegel outside of their utility as food or drink for humans. In rehabilitating the plant, Marder theorises plant-being as an inexhaustible generosity towards the Other. Whilst Marder tries to construct an ethics of plant life by positioning the plant as subaltern and emphasising the need to respect its 'absolute Otherness', other theorists have pursued different routes. Nealon (2016), for instance, proposes a biopolitics which embraces the vegetal, unpicking the position of plant life in the work of Foucault, Derrida and Deleuze and Guattari in order to support his insistence that plants are the paradigmatic subjects of modern biopower (see also Stark, 2015). In an era of climate crisis, the plant provides a simultaneously radical and grounded figure with which to rethink and critique Life beyond the human (Nealon, 2016 – see also Coccia, 2019 for a discussion of plants as constitutive of atmosphere, and thus, of life).

Matt Hall (2011), too, takes the history of western thought as a starting point in his philosophical explication of 'plant personhood'. As he points out, instrumental human-plant relationships are ecologically nonsensical, yet deeply ingrained in the western psyche. The houseplant that sits on the windowsill is so far outside of an everyday moral consideration that being a bad 'plant parent' and managing to kill even the most hardy of cacti is considered a joke (Hall, 2019b). In stark contrast to Marder, however, Hall goes on to explore plant personhood outside of the Western episteme, in eastern, pagan, and Indigenous thought. Considering the recognition of plants as kin in such traditions, Hall makes a case for plant ethics based not on otherness, but on close relation and care. It is vital to recognise that much multispecies and plant-thinking overlaps with and owes its roots to Indigenous cosmologies and perspectives (TallBear, 2011). It is therefore important to retain a productive

tension between taking the implications of Indigenous knowledges seriously, whilst not simply mining them for our own theoretical purposes (Kwek, 2018). Eduardo Kohn's (2013) work provides one example of how such a cross-cultural transposition might work in the context of the semiotic worlds of trees and other beings in the Ecuadorian Amazon.

Work by Indigenous authors within CPS, like that of the plant neurobiologists discussed above, asks what plants might teach us if we listened more closely. Robin Wall Kimmerer (2013) weaves plant science together with Potawatomi teachings, speaking of domesticated crops such as beans, corn and squash as eloquent teachers who 'wordlessly in leaf and vine embody the knowledge of relationship' (p.140), creating space for coexistence and mutual flourishing. Mary Siisiip Geniusz's (2015) book of Anishinaabe botanical teachings espouses an ethic of asking before taking what the plant has to offer. Talking to plants, while feeling silly at first, seems sensible once one considers the plants as the 'persons' that they are. Anishinaabe creation teachings – in stark contrast to Aristotle's chain of being – places humans at the bottom of the four interconnected orders of life (first earth forces, then plants, non-human animals and finally humans). The most vulnerable of all, humans forget our dependence on the other orders of life at our peril. Indigenous perspectives on plants are firmly rooted in relation to land and soil, as gardens become active places through which to enact Indigenous knowledge, marrying epistemology and ontology – or 'place-thought' – both inside and out of the academy (Hond et al., 2019; Peach et al., 2020; Watts, 2013).

Amongst the displacement of the human in multispecies and plant thought, it is of course imperative that the differences between humans, so often drawn with violence, are not flattened. CPS must also attend to the colonial histories in which the blurring of lines between the human and the non-human plant or animal was not celebratory, but highly destructive (Foster, 2019; Ives, 2019). There is a wealth of feminist, queer and decolonial scholarship emerging which offers politically engaged correctives to earlier plant thought, rehabilitating the plant through situated intersectional analyses (e.g. Myers, 2017a; Gibson and Brits, 2018; Sandilands, 2017; Szczygielska and Cielemęcka, 2019). Importantly, the history of plant-human interaction is a heavily gendered one; whilst certain authors have attended to these relations (see in particular Shteir, 1996; Schiebinger, 2004), the close collaborations between women and plants have long been underacknowledged. Feminist theory thus has much to offer in attending to specific, material plant-human relations which emerge at particular moments in time, unpicking how they might serve or resist the interests of heteropatriarchal capitalism (Cielemęcka and Szczygielska, 2019).

Much of this work is speculative in nature, concerned with projects of 'worlding', or the imagining of alternative futures in which we ally ourselves more closely with plants (Myers, 2017b; Meeker and Szabari, 2020 – see Battaglia, 2017 for discussions of plants in space). Art and visual culture have a central role to play in these projects in challenging traditions of plant representation and re-envisioning our relationship to the botanical world (Aloi, 2020). Whilst CPS is an emergent field, it is not ploughing new ground. It is undeniable that plant lives have not been granted sufficient attention or moral consideration within the western academy and everyday life, but if the plant is to be meaningfully re-evaluated, authors should locate themselves within those traditions which came before; engaging and citing generously (Todd, 2016). In taking non-western ontologies seriously, one might better attend to the diversity in perspective offered by the plant kingdom, resisting the generalising inclinations of early plant-theory to refocus on spatial and species particularity.

IV Plant Otherness

One of the most fundamental debates within plant studies is how to deal with the perceived ontological 'otherness' of plants to human/animal subjects, in theory and in practice. Unquestionably, plants are radically other-than animals. Theorists within CPS are concerned with what this otherness means for how we think with and about plants as subjects, as well as its transformative potential for our ethical imaginations more broadly. Following Plumwood (1993, 2008), if the interwoven dualisms of

western thought – which disallow a non-hierarchical concept of otherness – are to be escaped, there must be room for recognising *both* continuity and difference. This first section focuses on the different conceptualisations of plant otherness/sameness which have emerged within CPS, first in philosophical terms, then more practically within scientific and linguistic debates and plant-human research.

Thinking with plant-otherness has self-consciously been an intellectual exercise for some authors including Karen Houle (2011), who argues for the radical reimagining of Life and its relations provoked by philosophising with plant bodies. Houle (2018), following Sylvie Pouteau, sees the fundamental ontological difference between plants and animals in the fact that animal bodies are bifurcated by the mechanism of gastrulation – an early embryonic transformation which gives rise to a dualistic state of being, divided between the inner (mouth, digestive tract, anus) and the outer. Plant bodies, on the other hand, are not bifurcated in this way. They do not have this dualistic or 'Cartesian-inclined' state of being, facing only outwards and thus demanding their own phyto-specific ontology which resists the inherently oppositional dualisms of 'animalesque' thought (Houle, 2018; Pouteau, 2012, 2014).

Marder (2013) similarly considers this outward-facing nature of plants in his *Plant-Thinking,* arguing that the ontological otherness of the plant is absolute. As humans, he argues, we can never fully *know* the plant; plants lack the psychic or subjective interiority of animals, and constitute rather than set themselves apart from the environment that sustains them. Plants thus have their own distinct subjectivity which, according to Marder, does not overlap with the human. In order to hear plants 'speak', then, one must learn to listen to the silences, leaving room for the untranslatable so as not to impose human voices and discursive categories onto the vegetal world (Marder, 2017). The peculiar ontology of the plant comes to represent the embodied limits to empathy. Empathy, Marder (2012) argues, presupposes a fundamental commonality between parties, which is precluded by the impossibility of human self-recognition in the vegetal world outside of an injurious and narcissistic anthropomorphism. To take an example, Franklin Ginn (2016) draws upon this 'extreme otherness' of the plant in theorising the inherent uncertainty and unpredictability which characterises the practice of domestic gardening. Considering plants as archives of their external conditions, Ginn suggests that gardeners can assist in the flourishing of plants, but can never control them, since there is 'no self or subject to bring under control' (2016, p.116). Even the temporality of the garden plant is not their own, but is that of their Other, be that the diurnal cycles of light and dark or the calendars of insect pollinators. For Ginn, the recognition of this plant strangeness facilitates a full appreciation of the depth of partnership between gardener and plant.

This 'strangeness', however, is at risk of being fetishised. As put by Kohn (in Kirksey and Helmreich, 2010, p.565), 'If we take otherness to be the privileged vantage from which we defamiliarize our 'nature', we risk making our forays into the nonhuman a search for ever-stranger positions from which to carry out this project'. What, then, are the limits to Marder's claim as to the radical otherness of plant life? Plants, like animals, exhibit coordinated responses which are more than simple, local chemical reactions, and which involve some of the same neurotransmitters (Buchanan, 2014). Plants can respond to the sound recording of a caterpillar munching a leaf and produce defence chemicals before any of their leaves have been touched (Pollan, 2013). Gagliano et al. (2014) showed that mimosa plants can remember a stimuli, such as a drop or a shake, *and* demonstrate the learned response a month after initial testing. For plant neurobiologists, such evidence points to the existence of a certain type of sentience, proper to plant life. Terms such as sentience and intelligence, typically reserved for humans and other 'high-order' animals, have been extended to the plant kingdom in order to recognise and valorise the remarkable capacities of plants, although not uncontroversially (see Alpi et al., 2007).

Such language draws animals and plants into closer relation than Marder's extreme otherness would allow. This is not to denigrate the plant by placing it in some hierarchy of intelligence, but rather to transform our definitions and understanding of these concepts. Gagliano's mimosa experiments make it clear that brains and neurons are not a necessary requirement for learning, communication

and coordinated response. Instead, plants invite us to pursue distributed definitions of sentience, intelligence – defined as the ability to respond optimally to one's environment, and – perhaps controversially – consciousness (Pollan, 2013). In her philosophical reassessment of plant intelligence, Baker (2017) argues that it is unnatural to draw a conceptual boundary line, for instance between animals and plants, where there is no justification for it, and where similarities would constantly draw us across due to its arbitrary nature. It is entirely possible, therefore, to correctly extend concepts such as intelligence through a family resemblance, without implying a comparative 'lack'. Context allows for the acknowledgement of different instantiations of intelligence or sentience; plant intelligence is not 'lacking', but is proper to the world of the plant.

By redefining certain terms such as 'consciousness' from the plant's perspective (Myers, 2015), theorists can be freed from Nagelian concerns over the inaccessibility of the consciousness of the Other and the definitions of consciousness as 'something that it is like', and instead attend to the world through observation (Holdrege, 2013; Nagel, 1974). Conceptualising the consciousness of living beings as how they 'are' in the world unfurls a multitude of learning possibilities; each creature carries with it a mode of being and openness peculiar to their species (Bristow, 2016). To this end, redefining consciousness, sentience and intelligence from the plant up – as an appropriate responsiveness to the lived environment – frees animals and humans alike from anthropocentric, phallogocentric and ableist determinations of these terms. In vegetalising 'human' concepts, we are invited to step out of the hierarchical chain of being and 'renaturalise' ourselves amidst the conflicts and connections of our world (Ruddick, 2017). Here one often faces the charge of anthropomorphism. Marder (2012), for instance, takes issue with the projection of the human onto the plant as a narcissistic practice of self-reverence which does a disservice to the plant being observed. The major function of such a charge, however, is arguably to bully people out of thinking differently (Plumwood, 2009). Twisting the concept of anthropomorphism can be a useful weapon against an anthropocentrism in which the human gets to 'hold all the goodies', such as agency, intentionality, language (Barad, 2012, p.27). De Waal (1999) speaks, for instance, of an 'animalcentric anthropomorphism' which encourages an understanding of the animal perspective with reference to human experience. But what of a 'phytocentric' anthropomorphism?

It is difficult to recognise human resemblance in plants, but instead of recognising Us in Them, we might recognise Them in Us. The concept of 'phytomorphism' – taken up by anthropologist Natasha Myers (2015) in relation to the material intimacies of plant scientists with their vegetal research subjects – makes explicit this multidirectional potential of (anthropo)morphism, indicative of our capacity and willingness to open ourselves up to others. Phytomorphism invites us to 'vegetalise' our already more-than-human bodies and attach ourselves to the things which plants care about, and which, in the end, humans must care about too if we are to build a more sustainable relation to our planet (Myers, 2014, 2017b). Suzanne Simard (2021), for instance, speaks of 'mother trees' and their 'children', purposefully to re-place us within nature and overcome the claims to human exceptionalism perpetuated by critics of anthropomorphism. Asking questions like 'what do plants know?' draws attention to plants as living beings with their own ways of knowing the world. I stress, again, that this is not a new attunement, but one which many communities across the world have been learning from for centuries.

In this regard, Hall (2011, 2019a) attribution of 'personhood' to plants is not a reductive assimilation of plant to human, but is consistent with many non-western and pagan ontologies. In contrast to Marder, Hall pays close attention to the history of plant life and the particularities of diverse plant-human relations. Plants are first regarded as kin based on the recognition of consubstantiality – quite literally given our common single-celled ancestor some 1.6 billion years ago – with the structuring of relationships taking place within a heterarchy, not a hierarchy (Hall, 2011, 2019b). Such a recognition, consistent with Indigenous ethics of connection, throws open a world of situated responsibility within which a more grounded more-than-human ethics of mutual care might flourish (Rose, 1999). Arnold et al. (2021), for instance, reify the attribution of personhood to trees within an aboriginal Australian Yuin ontology, arguing that the anthropomorphism

inherent in conversing, or 'yarning', with trees opens a space for communication and establishes an intuitive basis for empathy with nonhumans based on the tree as a relative or extension of the body. The emplacement of human, plant, animal and land identities within one another radically reconceptualises the separation of the 'individual' in ways which resonates with the plant's own troubling of this category (Arnold et al., 2021; Country et al., 2015).

Often, when these debates surrounding plant-otherness are grounded in real-life observations of plant-human relations, a common line of argument emerges that plant bodies are *both the same as and different from* human and animal bodies (Atchison and Head, 2013). For Atchison and Head, the plant perspective opens up new ways of thinking about life as a process in which common capacities manifest themselves in different material forms. Understanding the specific differences of plant bodies does not, therefore, preclude a form of human-plant relation based on a politics of recognition or shared intuition, but instead invites us to trouble this binary of same/different. Krzywoszynska (2015), for instance, explores the difficulties presented by plant alterity in farm work which result in plant-human relations often being considered in terms of control rather than care. She describes the relations of farmworkers with vines as based both on the recognition of never fully 'knowing' the plant, as well as the intuitive actions that emerge from the close relationships formed between workers and plant. 'Intuition' is an interesting term to unpick, arguably denoting a pre-conscious recognition of a shared 'aliveness' between human and plant. What might the charismatic growth of spring-vines compared with static winter-vines tell us about the flux of plant otherness/resemblance through place and time?

The tracing of similarities between people and plants has a practical purpose in everyday life, as a basis for recognising how we are always already affected by plants, and as a means of developing relations of empathy which might benefit plants in human projects such as wildlife conservation (Margulies et al., 2019). Once this basis has been established, we might learn to attune ourselves more closely to plant difference, opening up our sensoriums to develop new capacities to act with and among plants (Jones, 2019; Myers, 2018). Learning to be affected by plants is not a linear process; at different times and in different spaces it involves the differential recognition of plant-otherness or similarity as the situation invites. Interrogating the challenges involved in 'knowing' plants does not lessen the imperative to make the attempt. The concept of plant personhood mistakenly rejected by Marder as naïve and problematic simply seeks to emphasise connection in recognition of shared characteristics. As put by Hall (2019a, p.9), 'in a world in which human societies have constructed and emphasised difference in order to justify domination…the ethic of connection is a powerful countervailing force'. Thinking with plants pushes us away from taking the individual as the locus of ethics, inviting us to think through life as connection, and the experience of living as multiple, contingent and changing (Sandilands, 2016a).

V Plant Ethics

How, then, might we conceptualise the ethical standing of plants? As remarked by Sandilands (2016b, p.244), there are many 'philosophical and practical quagmires' surrounding plant agency, in particular their ability to experience stress. A foundational critique in CPS starts from the position that the zoocentrism promoted by animal theorists as a supposed antidote to anthropocentrism has, at times, placed value on certain kinds of 'sentient' creatures based on human resemblance; the types of pain or cognitive experiences of suffering that we can recognise in ourselves (Marder, 2014). Instead of displacing the human, we end up reifying our status as an ethical and ontological yardstick amongst bios. As explored in the previous section, extending concepts such as sentience to plants invites a rethinking of our ethical and moral obligations to plant life. This ethical rethinking collides with difficult questions of diet, climate change, race and capital amongst others – how can we best value plants within their entangled relations with other beings?

What a 'plant ethics' should look like is up for debate; proponents have advanced utilitarian, relational and neo-Aristotelian arguments, as well as those based on inherent worth (Hall, 2009; Kallhoff et al., 2018). The recognition of sentience in living beings –

defined as the having-of interests, such as the avoidance of pain and the experience of happiness – has typically been important in asserting a claim to ethical consideration (Pelizzon and Gagliano, 2015). As plant neurobiologists have shown, plants very much have interests; they recognise and respond to danger and stress, and whilst they do not cognitively experience 'happiness', they have determinate conditions for flourishing. Indeed, Baluška (2016) points to plant synthesis of the stress-response hormone ethylene – which acts as a powerful anaesthetic in animals – as evidence of some form of negative experience in plants. Of course it must be acknowledged that 'experience' cannot be taken in the cognitive sense that it is often understood due to the plants' lack of a central nervous system, but it should rather be read as an invocation to torque our understandings of consciousness or 'experience', in order to rough out an ethics from the plant's point of view. This suggestion is, of course, not uncontroversial, as Marder and Francione (2012) debate around what this might mean for vegan ethics exemplifies.

When considering the plausibility of plant sentience and ethics, many plant theorists are drawn towards the logical quandary of how to make ethical food choices in light of the fact that almost all possible foods are drawn from sentient beings. The screaming lettuce has long been a subject of humour and ridicule (see Morton, 2019), but what sort of ethical transformations might be prompted if it were taken seriously? Marder (2013), for instance, advocates for an 'eating like a plant', calling for greater local consumption and a 'refusal to regulate the human relation to plants on the basis of commodity-economic logic' (p.185). How should a vegan ethics respond to the acknowledgement that all consumption involves some form of violence and death? This acknowledgement does not seek to denigrate the suffering of animals by means of comparison; clearly a vegan diet also paradoxically ensures that fewer plants are consumed overall. One engagement by Gaard (2017), following Plumwood, outlines an ecofeminist approach to this problem, based in a contextual moral veganism which is rooted in grounded ecological relations rather than universal rules or ultimate moral destinations. Whilst individual dietary choice is all very well, it is also essential to step into the ethical 'quagmire' of plant instrumentalism which underpins our system of industrial agriculture. Fake meat is a particularly fertile site for thinking through the ethics of plant-based consumption; an industry projected to be worth $85 billion in the next decade (Sexton, 2018; Willey, 2021). Willey's queer analysis of the fake meat industry reads pleasure and harm together, providing an excellent example of how complex multispecies ethics can be read alongside sustained attention to human categories such as class and sexuality. Crucially, as Willey (2021, p.245) puts it, 'it goes without saying that plant foods are also the fruits (and vegetables as it were) of relations of violence and exploitation that affect our human and nonhuman kin'.

A key concern within multispecies work in general is ensuring that the 'human' does not become an undifferentiated mass within analysis; specificity of language is important in order to retain an ethical precision. Certain terms such as 'native', 'cultivation', and 'colony', for instance, have a multireferential capacity within the English language which allows them to travel freely between plant, bacteria and human (Hartigan, 2015). Hartigan (2017) similarly explores the concept and language of race which historically crosses over into the plant kingdom as a biological category below subspecies and above strain, drawing attention to those power-laden dealings with plants which come to venerate certain species relations at the cost of others. These types of linguistic slippages can be useful in drawing attention to how the boundaries between nature and culture are actively configured and reconfigured (Biermann, 2016).

Scholars writing about native plants, for instance, have considered the 'planting and displanting' of both humans and plants within settler colonial projects in order to trouble critiques which hold that species nativism represents a thinly veiled anti-immigrant xenophobia (Mastnak et al., 2014). Haraway and Tsing's 'Plantationocene' concept similarly endeavours to foreground the violent entanglements of human and plant bodies and their centrality to historical (and contemporary) projects of racial capitalism (Haraway et al., 2016). Haraway et al. have, however, been criticised for the multispecies flattening inherent in the blunt edge of the comparisons drawn between plant and human in

referring to plantations as the 'slavery of plants' (Davis et al., 2019, p.5). As argued by Davis et al., an engagement with existing work within Black and Indigenous geographies and ecologies would help to attend more carefully to the spaces of the plantation, and the specific relations and ruptures forged therein (see McKittrick, 2013). King (2016), for instance, uses a framing of Black fungibility in her approach to the plantation, narrating the historical imagination of Black bodies in seventeenth-century Barbados as plants and vegetation as one specific instantiation of the making-fungible of Black bodies through their porous connections with plants. In tracing the entanglements of human and nonhuman terminology, for instance between the worlds of eugenics and plant breeding (Biermann, 2016), a critical eye must be kept on the uneven dynamics of power which permeate these histories when naming and writing the nonhuman.

Geographers have also been active in developing a language to conceptualise the work that plants do within capitalist economies and how it is valued (see Ernwein et al., 2021); a step towards developing more ethical relations with plants not just on the individual or local scale, but on a more industrial and systemic level. Drawing, for instance, on Perkins' (2007) characterisation of 'nonsocial labour' within his Marxian actor-network mapping of Dutch elm disease, and Battistoni (2017) notion of 'hybrid labour', plant growth has been framed in terms of nonhuman labour (Ernwein, 2020; Palmer, 2020). For Perkins (2007) and Palmer (2020), who considers the work of forests as carbon sinks, this language draws attention to the political power of nonhuman life, critiquing the valuation of plant life as 'natural capital' or 'ecosystem services'. Rather than reducing plants to the status of 'docile workers', the concept of labour is redefined as the metabolic capacity to change the form of matter; an open-ended process not necessarily prescribed by capitalist logics of productivity or efficiency (Palmer, 2020). Conceptualising plants as workers can also draw attention to their active role in shaping the work demanded from the humans who labour alongside them (Ernwein, 2020; Nyman, 2019). This framing of plants rubs somewhat uneasily up against the tendency towards enchantment which characterises much plant-thinking, providing a provocative challenge to more emotion-centred readings of plant-human relations. One of the greatest promises of plant-labour as a proposition lies in its binding together of material plant-bodies, their effects, and the larger-scale processes – industrial and non – which they are tied to. As such, a plant ethics cannot by its very nature be limited to the plants themselves, but is inherently multispecies, multi-scalar and 'multi-elemental' – as already conceptualised in certain non-western metaphysical traditions, such as the Dakota ethic referenced by TallBear (2011).

Such a 'multi-elemental' ethics – for want of a better phrase – draws attention to the soil (Puig De la Bellacasa, 2017), to water, fire (Eriksen and Ballard, 2020) and to what Coccia (2019) refers to as the 'ontology of the atmosphere'; the plant's production of the world through its invisible atmospheric 'labour' in which 'every living being is first of all what makes possible the life of others' (p.47). Air is the fundamental commons which intimately ties us to plants, central to our ethical considerations of animals and plants alike through the universal exchange of breath (Irigaray and Marder, 2016). As Pratt (2018) argues, air quality is a highly significant human health risk, implicated in all major health issues. It is also, of course, a highly unequal resource, with disparities in urban green cover and 'botanies of negligence' becoming crucial sites of socio-environmental inequality, disproportionately affecting both the air and soil quality and consequently the health of poor neighbourhoods and communities of colour (Demos, 2020; Shcheglovitova, 2020). The social contract of atmospheric production binding plants and humans is central to achieving multi-species justice for both groups, as made concrete in artist Natalie Jeremijenko's experimental positioning of trees as landlords designed to reconceptualise the value system defining our current relations (in Pratt, 2018). Urban and rural spaces demand different plant ethics attuned to their specific multispecies contexts, yet there will always be a tension of scale dictated by the very nature of the plant as simultaneously rooted in context-specific place *and* outwardly productive of its broader environment. If plants are considered solely in terms of the atmosphere and ecologies they co-constitute, they risk being backgrounded once

more as 'environment' rather than subjects in their own right. This tension might thus be productive of a peculiarly planty ethics of scale if we allow our attention to be guided by vegetal bodies, considering their interests alongside our own.

VI Plant-Human Attunements

Returning to the epigraph of this paper, how might we hear plants sing? Methodological innovation is perhaps the area for which geographers are best recognised within interdisciplinary plant scholarship, in particular the interventions of Hitchings, Head, Atchison and Pitt (see Ryan, 2011; Gibson, 2018a; Lodwick, 2019). Methodological and theoretical approaches which have been advanced include walking, photography and visual ethnography (Hitchings, 2003; Hitchings and Jones, 2004), participatory mapping (Shillington, 2008), the concept of showing and being shown, influenced by Tim Ingold (Pitt, 2015) and the research strategy of 'following the plant' (Head and Atchison, 2009; Head et al., 2012;Pottinger, 2018). Vegetal geographers have also played with written form, experimenting with 'short-story-telling' (Phillips and Atchison, 2020), photo essays (Lang, 2018a) and reflexive autoethnography of researcher embodiment (Betz, 2020; Jones, 2019). Recent calls for greater experimentation within vegetal geography are allied with agendas within CPS – particularly those emerging from anthropology (Kirksey, 2014; Myers, 2017a) – which typically approach methodological experimentation as transformative of both research and real-world plant-human relations and ethics.

Within CPS, the lively interplay between science, philosophy and art has produced a veritable orchard with fruit ripe for picking by social scientists looking for inspiration. In particular, the idea of 'play' is considered an important orientation towards plant life (Marder, 2013). 'Play' liberates beings from the realm of necessity and values of efficiency or productivity, and is therefore a useful means of refocusing the lens away from teleological accounts of plants-as-commodities or raw material. Considering plants outside of the logic of utility, even when researching food chains or commercial forestry, leads us to attend to plant bodies in a less instrumental manner and consider our relations within a broader context of shared life and inherent worth (Sandler, 2018). As put by Gibson and Warren (2020), we need diverse experiments in both epistemology and ontology in order to conjure new worlds into being (Myers, 2017c).

Experiment and speculative play with vegetal life invites different modes of attention; a concept much explored by bio-artists seeking to draw audiences' attention to the liveliness of plants (Sommerer et al., 2016). Plants challenge us to connect with our somatic and sensory experiences in order to consider the more embodied meaning of sentience as being alive to one's environment. Natasha Myers (2017a) pursues this invocation by experimenting with slow shutter-speed photography to document the gestures of living plants, drawing energy diagrams as a means of recording scents. Myers also uses the kinaesthetic attunement of dance – conceived as a universal movement common to both human and nonhuman nature (Schwan, 2016) – to attend to the rhythms, temporalities and movements of plants explicitly as a means of pushing against the claims of scientific rationalism which disavows nonhuman sentience. The embodiment of Stevie Wonder's *Black Orchid* by dancer Eartha Robinson in the 1978 documentary The Secret Life of Plants (Green, 1978) similarly draws visceral lines of phytomorphic connection between plant and person (video available on YouTube), performing the dissonances of race and urban nature and pointing to the potential of film as a medium for exploring plant-human relationships and plant perspectives, as explored by Amy Cutler (2020 – see also Gandy and Jasper's (2017) film *Natura Urbana*). Such literal embodiment of plant performance recognises the creative agency of plants, problematising their fetishisation as aesthetic objects (Vieira et al., 2016).

Artists who create pieces of 'living art' involving live plants similarly play with the gap between the meanings imposed by humans and the meanings generated by the growth of the plants themselves (Beach, 2020; Hamilton, 2015; Valentine and Irons, 2016). Weeds are especially interesting plants to follow in this context. Lacking determinate biological meaning, the absence of utility inherent in the unruly definition of weeds as plants with 'an innate

disposition to get into the wrong place' (Ruskin, 1888, p.64) provides an interesting imaginative space in which to explore the values we place on plant life (Lawrence, 2019). The weed reveals the limits to a more-than-human ethics of care, estranged from the utilitarian valuation of productive life. Artist Ellie Irons (2017) cultivates 'weeds' in her *Sanctuary for Weedy Species,* conceptualising them as the perfect companion species for the Anthropocene Age, resonating with Anna Tsing's (2012) concept of 'slow disturbance landscapes' which draw us into collaborative cosmopolitan kinships with those species through which diversity may continue to emerge in the ruins. In facilitating 'play' in these landscapes, art plays a central role in the ontological reappraisal of 'valuable' life, particularly within urban contexts (Gandy and Jasper, 2020b – see Thorson, 2017, Gibson, 2018b, and Aloi, 2018 for further discussion on plants in contemporary art).

As well as considering the multiplicity of plant-human relations grown in the contemporary world, it is also vital to situate them historically in order to acknowledge and critique the structures of power that determine which modes of relation tend to dominate (Cielemęcka and Szczygielska, 2019; Lawrence, 2020a). Trees and forests in particular have been given considerable attention within historical geography, as in efforts to trace the colonial and state presences which haunt contemporary 'arboreal biopolitics' and understandings of forest spaces (Davis and Robbins, 2018; Griffin, 2010), the role of trees in protest and resistance (Cloke and Jones, 2004; Griffin, 2008) and the securitisation of nation states (Biermann, 2016; Ginn, 2008). The socio-political lives of trees are more conspicuous than those of other plants due in part to their slower and more legible timescales, as well as their firm rootedness in space which allows individual trees to be imbued with intergenerational meaning and emotion (see Rival, 1998).

By contrast, other vegetal forms, such as the flower, are defined more by material instability, granting them the ability to represent an image of impermanent vegetal mass beyond individual plant-bodies, demanding alternative modes of approach (Lawrence, 2020b). One of the key contributions of CPS, then, is to shift attention away from the rootedness of plants and the fixity of the individual, troubling our conceptions of scale and what actually constitutes 'individual' beings – vegetal and otherwise (Aloi, 2019; Pitt, 2021). Plant bodies are not contained within a finite skin, but can spread rhizomatically until we are not quite sure whether we can count ten primroses beneath the oak or only one; fifty aspens or one suckering clonal colony. Their permeable boundaries challenge assemblage thinking and fundamentally disrupt the lines drawn between subject/environment (Coccia, 2019; Tsing, 2015). In pursuing these provocations, (historical) geographers can borrow approaches from the flourishing body of work emerging from the intersections of literary ecocriticism and CPS.

Literary studies is one of the fastest growing areas within CPS, with scholars concerned with rehabilitating literary plants from their typically backgrounded designation as 'environment', and considering the ways in which a 'phytopoetics' might help us to understand abstract notions like space and time in different ways (see Laist, 2013; Jacobs, 2019; Becher, 2020). Following the approaches of literary scholars to the trans-corporeality of human and plant bodies (Alaimo, 2018; Streit Krug, 2013) – how bodily boundaries are co-constructed and crossed – can help researchers playing with plant shadows in archives. Accessing plants' 'voices' in archives can be challenging, since they have almost always been translated by at least one human voice or hand, sometimes more. Patricia Vieira (2019), for instance, proposes 'phytographia' as a mode of reading vegetal inscription in both the materialities and literary content of writing. Again, this is an experimental orientation, inviting us to listen to the vegetal kingdom in different ways.

In experimenting with plants in theory and practice, the question of ethics re-emerges; to what extent might plants be considered research 'participants', and how might this transform our approaches to them (Bastian, 2017)? Pitt (2017), for instance, experiments with positioning plants as 'experts' and considers planty research as an apprenticeship. Whilst retaining a healthy scepticism as to the practical challenges of involving plants in the decision-making process (see Atchison and Head, 2017), Pitt argues that it is the questions asked in this

process which are most valuable. Importantly, the question of *who* is this research for? In considering plants more seriously as 'participants', we are pushed to consider what research 'aims' looks like from the plant's perspective. This leads us to pursue lines of conversation which flow not only across species and disciplinary boundaries, but also between academic and non-academic worlds (Dyke et al., 2018). Much geographical work on plant biosecurity in particular pursues these experimental provocations, asking how we might better 'live with' invasive species or plant disease in practice, constructing a new politics for biosecurity which can more deftly respond to 'life's capacity for emergence' (Tsouvalis, 2019, p.3, Atchison, 2015). As put by Myers (in Lomeña, 2020), if we thought like a plant, we would pay more attention to what we put in our water, air and soil. It is the questions we ask ourselves as researchers when planty 'participants' are taken seriously that push research further towards eventual aims of expressing alternative futures of living well with plants.

VII Conclusion

The work in critical plant studies introduced in this paper has turned the theoretical soil of more-than-human scholarship, drawing attention to the specificities of working with plants, from how to deal with their ontological 'otherness' to their troubling of ethical frameworks and demanding of new methodological attunements. Much of this work maintains a high level of fluidity across disciplinary lines, allowing for a truly holistic approach to plant life. Geographers have contributed to the unfurling of CPS as a project from the start, calling for greater attention to 'vegetal politics' in tackling head-on the persistent backgrounding of plants within our discipline, as well as proposing innovative methodologies through which to practically approach plant difference (Atchison and Head, 2013; Ginn, 2016; Head et al., 2012; Pitt, 2015). Within geography, however, the bias towards animal life remains significant.

Meaningfully involving plants within our reconsideration of the more-than-human pushes us beyond a zoocentric ethics of care based on recognisable animal sentience, instead forcing us to confront the uncomfortable reality of an entangled vegetal ethics of life built partially around necessary violence and harm (Hall, 2019b). Here, food geographies in particular stand to gain from confronting the future of plant-based proteins in order to centre plants and their inorganic associates both in terms of ethics and in questioning the ecological implications of such dietary shifts. The urgency of the current ecological crisis (Ryan, 2016) similarly compels a need to populate the ground with stories of plant experimentation in the face of climate change, which geographers are well-placed to provide (see Klocker et al., 2018; Gibson and Warren, 2020). In particular, the important role of urban forests in climate change mitigation demands critical insights into plant-human relations to supplement more quantitative studies of tree planting and policy (Saldarriaga et al., 2020; Phillips and Atchison, 2020).

Despite the relative lack of disciplinary identity, the 'field' – or amorphous shrubland – of vegetal geography is currently flourishing. This paper has drawn attention to the work going on within this area in the hope that geographers interested in the more-than-human might begin to think more carefully about the plants that feature in their work, be they living or dead, transformed into food or commodity. It has also sought to identify certain areas of cross-disciplinary conversation in order to more formally 'introduce' scholars within CPS to these geographical contributions. 'Vegetal geography' should remain an outward-looking informal community, but one which is seen to actively contribute to interdisciplinary developments in plant studies. My hope in drawing these two 'fields' together in this forum is that greater cross-pollination between geography and CPS is encouraged.

I began this paper asking what it means to hear plants. Rather than stopping at the perceived ontological otherness of plants and the inaccessibility of their experience to humans, I have argued that we should hold the shared similarities and differences of plant life carefully in balance in order to construct a viable ethics of engagement. Speaking of the plant as a 'who' not a 'what' (Kimmerer, 2013) and redefining certain terms such as intelligence, sentience, or agency from the plant-up provides a basis for empathy – a linguistic bridge around which relationships of care can be built (Hall, 2011). The plant draws attention to a multiplicity of vegetal scales,

from the individual leaf to the whole atmosphere, challenging our ethical and ontological frameworks. We must enter into dialogue with plants to imagine and create new worlds (Plumwood, 2009), and although this can necessarily only be drawn through a human lens, this should not stop us from trying; from experimenting, playing and sensitising ourselves to the plant kingdom.

Listening to plants takes us out of ourselves, out of our heads and our neural networks. It pushes us to consider the world from alternative, embodied perspectives. Plants are already central to our everyday lives and socio-economies, waiting for us to recognise them as kin and collaborators in our co-production of ecologically sustainable futures. There are many ways to listen to a plant – attune yourself, and see what you hear.

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Notes

1. CPS is a nebulous collective, rather than an institutionalised field. The literature discussed here is my attempt at pulling together some of the key voices.

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