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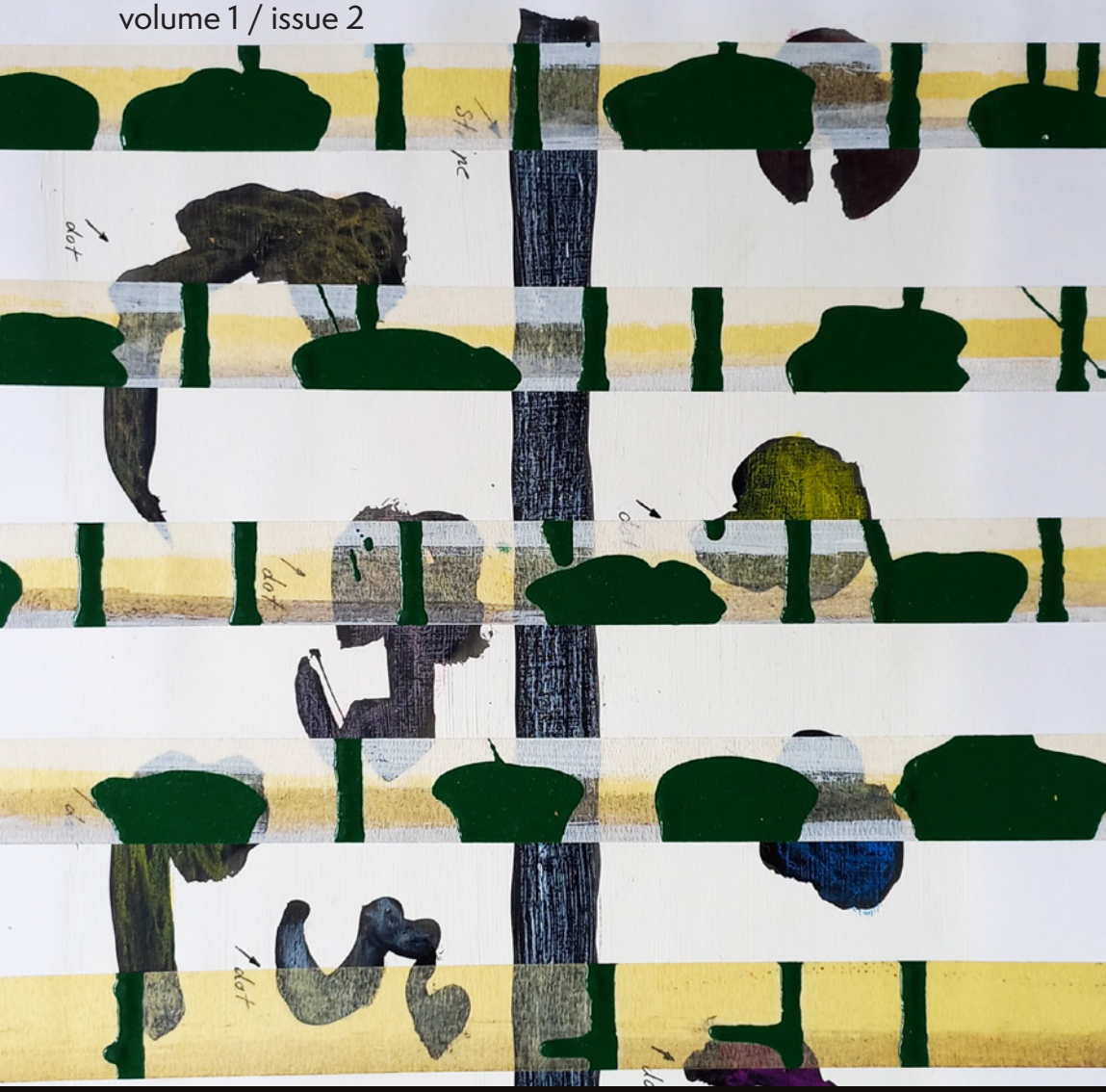

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Networks of Plants and the Language of Resonance in Science and Literature

EDITED BY

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Gabriele Dürbeck and Yixu Lu

Introduction: Networks of Plants and the Language of Resonance

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This Special Issue of *Plant Perspectives* explores the multifaceted relationships between scientific and artistic expressions and plants in various genres, from literature and art to dance and media. The multidisciplinary contributions in this volume are linked by an exploration of the concept of 'resonance' as a potentially meaningful way of establishing and describing an ethical and non-anthropocentric relationship between humans and plants. The concept of 'resonance' was originated by the German sociologist Hartmut Rosa. Rosa defines resonance as a relationship of response when a subject is affected by the world, perceives its otherness and uniqueness, and undergoes transformation through affectation, self-efficacy and adaptation (Rosa 2019: 19). Adopting Rosa's sociological concept to explore human-plant relationships means recognising plants, if not as persons (Hall 2011), then as beings with intelligence, sentience, agency and a kind of language – although they are silent. This recognition is based on critical and cultural plant studies, which not only emphasise the world-building capacity of plants as a fundament of our planet's life but also explore the many modes of human-plant entanglements, conceiving plants and their networks as processes of semiosis and communication (Marder 2012). To attend to this kind of language, critical plant studies presupposes the 'voices of non-human nature' (Peeples and Depoe 2014: 9), in particular a voice of plants that humans can hear if we think with plants and 'recognise them as kin … in our co-production of ecologically sustainable futures' (Lawrence 2021: 15).

The multiple ways of accessing the communicative capacity of plants and their silent voices have been discussed in recent decades not only in biology, botany, (forest) ecology and vegetal geography, but also in anthropology, ethics and literary, cultural and media studies. The latter are the focus of this special issue. The analysis of plant communication encompasses the ideas of a 'secret life of plants' (Tompkins and Bird 1973), a 'wood wide web' of interplant transfer of water, nutrients and defence signals (Simard 2021), and a 'language of plants' (Gagliano 2018). In this respect, plant signals are not conceived in a metaphorical

or symbolic way but as 'direct, sensory, and embodied' (Gagliano et al. 2017: xv). Plants respond to their environments through interactions with symbiotic microorganisms and mycorrhizal networks (Simard 2021), and through neurobiological and 'chemical dialogue' with each other (Mancuso and Viola 2015). In addition, plants possess electrical conductivity, the signals of which have been measured by galvanometers and 'crescographs' since the early twentieth century. Furthermore, in forest laboratories such as the *TreeWatchNet*, plants can 'speak' through sensors that measure their daily growth and sap flow as media-technical hybrids. Some authors have therefore conceptualised trees as subjects and 'narrators' (Schneider 2018) and attributed 'authorship' to plants (Gagliano et al. 2017: xxvi), albeit not from an anthropocentric or zoocentric stance. In contrast, German forester Peter Wohlleben (2015) has described the 'secret life of trees' in anthropomorphic terms, receiving broad public attention to the dismay of most mainstream academics.

Exploring the silent voices of plants in literature and poetry presupposes a 'porous' boundary 'between artistic portrayals of flora and the imprints left in texts by the plants themselves', what Patrícia Vieira (2017: 218) calls 'phytographia' or 'plant writing'. Phytographia is a 'communion' of the 'inscriptions of all living beings in the world' (Vieira 2017: 224) and the language of literature with the attitude and ability to recognise their imprints on human existence and to express these inscriptions artistically. Literature is seen as a 'mediator in the aesthetic encounter with plants' (225). The notion of a plant voice 'encompasses plants' silent presence in space and time, their sensory articulations within an Umwelt, and their modes of signification' (Ryan 2017: 283). This concept of vegetal voicing resists a 'techno-logical mediation' (275), 'literary conventions … and human paradigms of vocalization' (292), and is perhaps best mediated through poetry, though poetry too takes place within the confines of human language. Phytographia as a 'communion' of non-human and human language can be differentiated from 'phytopoiesis' or 'phytopoetics' that involves collaborative becomings between humans and plants (see also Ryan's article in this Special Issue). A broader conceptualisation understands 'phytopoetics' as an umbrella term for any kind of 'shaping of human culture by plants' (Jacobs 2022: 603) that includes material and metaphorical dimensions as well.

When plants and their networks are given a voice, they can, despite their ontological differences, act as an equal in relation to humans.

Listening to and addressing plants may favour 'a grammar of animacy', as Indigenous environmental biologist Robin Wall Kimmerer (2017) has suggested. While the common vocabulary of botany has well-established categorisations and taxonomies, accessing the animacy and interconnectedness of the non-human world at the deeper level of grammar and syntax seems difficult. As member of the Citizen Potawatomi Nation, Kimmerer shows that, in the Potawatomi language, it is always clear whether words refer to something animate or inanimate (seventy per cent of words are verbs as opposed to about thirty per cent in English). At the same time, she looks for a linguistic form to address the plant not as an object (it) but as a being, a person, emphasising a non-hierarchical human 'kinship with all of the animate world' (Kimmerer 2013: 56).

From here, it is a small step to a language of resonance in the sense of Hartmut Rosa, which has been also adopted in philosophy (Goldstein 2019) and literary studies (Malkmus 2020). Language has a constitutive role in human relations to the world, whereby 'the words do not denote practices that exist independently of them, but a constitutive part of them' (Rosa 2022: 152). In a phenomenological tradition, 'humans do not primarily appear as beings capable of speech, reason or emotion but of resonance' (68). For Rosa, a successful relationship with the world is a relationship of resonance, when we 'reach, move and allow ourselves to be moved by other people, by plants and mountains, by music, by history' (25). He diagnoses 'the strict separation between a speaking, animated human world of culture and a mute, raw material of nature to be tamed and controlled … as a cause of the ecological crisis of the present' (383). In contrast, resonance relationships and an increased resonance sensitivity allow for a more equitable human-plant relationship that challenges dominance, control and subjection. For him, like for Gagliano, Ryan and Vieira (2017), art and literature have the potential to break down the rigid boundaries between human and plant communication and enable a deeper, more respectful connection and co-creation.

The contributions in this special issue draw on Hartmut Rosa's concept of resonance to explore the relationships between humans and plants, approaching the topic from different angles within the humanities. Through an interdisciplinary lens, the contributions investigate the complex voices of plants and various forms of a language of resonance that can be found in essays, novels, science fiction, poetry and nature

writing, as well in interactive media installations and dance performances. By employing cultural-critical perspectives, they seek to unpack the rich implications of what it means to assume a reciprocal relationship between humans and plants. They also reveal the challenges and limitations of such an assumption, especially when considered in the context of European colonialism, scientific optimism and the profound environmental changes associated with the Anthropocene.

John C. Ryan's article on phytopoetics and the phytosphere explores poetry in relation to the root-soil interface, leaves and the inner domain of plants. Introducing phytopoetic theory to frame the deep connection between plant life and poetic expression, Ryan seeks to challenge conventional notions of plants as passive entities and emphasises their agency within poetry and practice. He argues that poetry informed by a phytospheric perspective foregrounds the agency of plants within their own multiple spheres of interaction. The concept of the phytosphere refers to the interrelated ecological zones in which plants are involved, specifically the rhizosphere (root zone), phyllosphere (leaf surfaces) and endosphere (internal plant tissues). The theoretical underpinnings of the article are developed through an exploration of the rhizospheric poetics of Louise Glück and Brenda Hillman, the phyllospheric poetics of Ted Hughes and Kathy Jetnil-Kijiner, and the endospheric poetics of Michael McClure and the Microcosms Project. Ryan sees the phytosphere as a site of linguistic diffusion and a catalyst for empathic engagement with plant life. According to Ryan, phytopoetics integrates botanical domains, foregrounds human-plant relationships and advocates a rejection of the marginalisation, degradation and romanticisation of plant life. Ultimately, phytopoetics calls for a deeper immersion in botanical life and a broader recognition of the agency of plants and their integral role in ecological and cultural systems. At the same time, Ryan advocates a shift in perspective to recognise humans and plants as co-creators of meaning and existence while urging us to prioritise their well-being for the continued health of the planet.

Similarily, Joela Jacob's article also explores the complex relationship between botanical terminology, literary tropes and cultural resonances, focusing on how different parts of plants serve as powerful figurations in literature and cultural practices. These symbolic representations, referred to as 'phytopoetic resonances', reveal how plants profoundly influence and shape human thought, imagination and cultural expression.

Jacobs defines the concept of 'phytopoetic resonances' as the ability of plants to leave an imprint on the human imagination, particularly through their resonances in language and literature. The article traces the linguistic application of botanical nomenclature – such as leaves, roots, stems, flowers and fruits – and highlights how these terms transcend their botanical origins to function as literary symbols, metaphors and allegories across different linguistic and cultural landscapes. Each plant part contributes to a larger, intricate network of cultural symbols and metaphors that profoundly shape human understandings of self and world. This modularity of plant parts allows their meanings to be isolated, combined and reinterpreted in different contexts, resulting in a rich, multi-layered cultural meaning. Highlighting the complex relationship between humans and the plant world, the article shows how 'phytopoetic resonances' – the recurring metaphorical use of plant parts in literature – emphasise the critical role of language and culture in shaping our perceptions of botanical life.

Birgit Schneider's article adopts a media theory perspective to revisit the historical discourse surrounding plant communication and discusses contemporary interfaces that transform plants into mediums of artistic expression. Drawing on Rosa's concept of resonance, which denotes an empathic engagement in which entities respond to one another in a meaningful, reciprocal way, the article explores whether mutual understanding, construed as resonance, can be achieved between humans and plants. The article pays particular attention to the concept of plant communication in both scientific research and artistic practice. One of the central critiques of the article is the role of technology in mediating our understanding of plant communication. While technology allows humans to detect and interpret signals from plants that would otherwise be imperceptible, it also shapes and limits the ways in which we understand these signals. When plants are featured in various interactive media installations that allow humans to 'experience' plant communication, the resulting sound or visual output is often more reflective of the technological medium than the plant itself, suggesting that these mediated experiences may not provide a true understanding of plant communication, but rather a technologically constructed interpretation. The article advocates a more critical and reflective approach to the study of plant communication, one that recognises the limitations of human perception and the complexity of interspecies interaction. The

question of whether the resonance we seek with plants is really about understanding them on their own terms, or whether it is more about satisfying human needs for connection and meaning in an increasingly mediated world, remains central to the study of plant communication and interspecies understanding.

Nick Enright's article explores the ramifications of colonial botany. The concept of 'interspecies entanglements' is used to analyse the complex power dynamics, knowledge transmissions, accumulation practices, commodification processes and desires implicit in the colonial discourse on plants. The article focuses on the essay 'On the Bread Tree' (1784) by the German naturalist Georg Forster. Forster's essay, the result of his involvement with Captain Cook's voyages, aimed to provide a comprehensive understanding of the breadfruit tree. At the same time, Forster aimed to transcend the romanticised narratives that had dominated European discourse, portraying the breadfruit tree through a lens of idealisation, symbolising abundance and paradisiacal attributes while overshadowing the agency and knowledge systems of Indigenous peoples. The article argues that Forster's text, while attempting to dispel misconceptions, nonetheless reflects hierarchical and Eurocentric paradigms. Despite Forster's efforts to present a more nuanced understanding of Pacific cultures and their relationship with the breadfruit tree, the imperial agenda of colonial botany persisted, exemplified by the expeditions led by Captain Bligh, which sought to exploit the economic potential of breadfruit for European benefit. The trajectory of breadfruit in colonial discourse reveals the intertwined narratives of science, culture and power during European imperial expansion and the era of colonial botany. It serves as the antithesis of a resonant relationship with the plant world.

Hannes Bergthaller's article offers a re-examination of Aldo Leopold's *A Sand County Almanac* as a cornerstone text within modern American environmentalism. The *Almanac* represents a radical departure from colonialism's utilitarian examination of the human-plant relationship. The idea of 'biotic citizenship' emerges in Leopold's narratives, which illustrate what it means to care for plants as fellow citizens. These narratives are consistent with an ethics of plant care that emphasises a reciprocal relationship in which both parties influence and shape each other. The article suggests that Leopold's land ethic advocates seeing humans and other creatures as citizens of the land community, a notion that goes

beyond purely instrumental views of nature. Understanding Leopold's land ethic requires recognising the importance of resonance – a reciprocal interchange in which both parties are shaped and constituted by their interaction, as defined by Hartmut Rosa. Leopold's narratives in *A Sand County Almanac* illustrate this process of becoming attuned to the land, where people learn to care for the land and its plant inhabitants through active and engaged relationships. The article argues that Leopold's approach contrasts with the scientific reductionism of his time, as his advocacy of establishing resonant relationships is not just about appreciating the aesthetic or ecological value of plants but recognising them as active participants in a shared community. Bergthaller also recognises that there are challenges in interpreting Leopold's land ethic because of its metaphorical nature. While human-centred interpretations see ecological citizenship as a derivative of human moral obligations within a republican framework, holistic interpretations emphasise the collective well-being of the biotic community, either sidelining ethical obligations to non-human entities or overshadowing individual rights. In navigating these interpretations, the article argues for a reconceptualisation of ethics beyond anthropocentrism that promotes reciprocal relationships and mutual respect among all members of the biotic community.

Claudia Keller analyses the novel *Once There Were Wolves* by Charlotte McConaghy in the context of contemporary discourses on biodiversity conservation, in particular the rewilding of the Scottish Highlands through the reintroduction of wolves as apex predators. The protagonist, Inti Flynn, has mirror-touch synaesthesia, which allows her to physically feel what others feel. This heightened empathy connects her deeply to both human and non-human beings. Through Inti and her deep connection with nature, the novel explores the complexities of fostering a new relationship with the environment amidst the conflict between conservation scientists promoting rewilding and local communities dependent on sheep farming. Keller interprets the novel as an exploration of contemporary ecological debates, particularly rewilding, using the reintroduction of wolves as a metaphor for restoring balance and biodiversity. At the same time, the novel shows the potential dangers of resonance. The novel's twist – that it was Inti's sister Aggie, not the wolves, who were responsible for the violence – complicates the idealistic view of resonance and empathy. The article argues that despite the suffering and failures experienced by the characters, there is

a sense of hope as both human and non-human communities begin to adapt and find new ways of living together. The ability to resonate with others – whether human, animal or tree – has the potential to foster a deeper understanding and connection. At the same time, the novel offers a critical perspective on the potential risks of an overabundance of resonance, challenging prevailing fantasies of harmony.

Heather Sullivan's article examines the central role of plants in three science fiction novels: Ursula K. Le Guin's *The Word for World is Forest*, Alan Dean Foster's *Midworld* and Marcus Hammerschmitt's *Target*. Common to all three novels is the portrayal of plants as 'vegetable beings' that create or sustain interdependent, multi-species communities, and a critical view of human civilisations that reduce plants to mere resources for exploitation. Le Guin's novella is set on a distant, forested planet inhabited by an indigenous humanoid species. The narrative contrasts the indigenous, forest-dwelling Athsheans with colonising humans from Earth who seek to exploit the planet's resources without regard for the ecological consequences. Foster's *Midworld* similarly depicts an alien forest filled with predatory plants and animals. While Indigenous people have adapted to the forest, developing physical and emotional bonds with the plant life that surrounds them, 'giant' humans from an exploitative, technologically advanced society come to harvest a valuable substance produced by the trees, destroying the ecosystem. The forest itself is portrayed as a sentient entity that helps the indigenous people defend their world. Hammerschmitt's *Target* takes a darker approach, depicting a forest world that is hostile and predatory towards humans. The forest in this novel is a vast, interconnected organism with a form of sentience that perceives humans as a threat and eliminates them. Sullivan argues that, despite their different perspectives on human interactions with plants, these narratives offer insights into rethinking our relationship with the plant world, emphasising the importance of recognising the agency and significance of plant life and establishing a resonant relationship with the plant world.

Dürbeck and Lü's article presents an analysis of three German texts from the early 2000s: Marion Poschmann's 'Laubwerk. Zur Poetik des Stadtbaums' (2018), Judith Schalansky's 'Hafen von Greifswald' (2018), and Anna Ospelt's *Wurzelstudien* (2020), in the context of new nature writing (NNW) since the 2000s in the UK and Europe. The emergence of NNW has offered a departure from the escapist, heroic and

at times nationalistic tendencies of its original American counterpart. British NNW embraces diverse voices and addresses the global climate crisis while redefining 'wilderness' to include urban spaces. The emergence of German NNW is influenced by these transnational traditions, but also has deep roots in German cultural history, stretching back to authors such as Goethe and Alexander von Humboldt. The essay argues that German NNW is characterised by a language of resonance, a critical engagement with environmental issues and an ethically reflective stance. The article posits that, despite their distinct approaches, the three texts in question share a common thematic interest in nature, particularly trees and plants and converge in their pursuit of a 'language of resonance' between humans and the natural environment. Judith Schalansky's essay paints a stark picture of a landscape marred by pollution and environmental degradation. Ospelt employs diverse methods to establish connections with nature while Marion Poschmann explores the multifaceted significance of urban trees from cultural and ecological perspectives. While addressing pressing ecological concerns through meticulous observation and poetic perception, these texts also demonstrate a renewed appreciation for the natural world and a deeper understanding of our place within it.

Gabriele Brandstetter's article explores the complex relationship between humans, plants and language in the context of the history of Western dance. The relationship between dance and plants is examined through linguistic and grammatical lenses. By looking at different prepositions – about, as, with and for – which are used to articulate connections, the article discusses the dominant representation of plants in Western dance history. Classical ballets such as 'The Nutcracker' emphasise the ornamental role of plants in enhancing human celebrations and social situations. The connection between humans and plants can be articulated through the preposition 'about'. Loïe Fuller's pioneering work in the early twentieth century, her 'Lily Dance', in which the dancer embodies the essence of a plant through movement and visual imagery, exemplifies the transformative power of dance; the preposition 'as' can be used to signify this process of transformation. The preposition 'for', which suggests a sense of participation, togetherness and coexistence between humans and plants, can be used to discuss contemporary dance projects such as Ruth Geiersberger's performance, where plants are recipients of care and attention. Brandstetter's article provides a

nuanced examination of the evolving dynamics between humans and plants in the context of dance, reflecting broader societal shifts towards ecological awareness and a reassessment of human-nature relationships in this genre. Emphasising the importance of acknowledging the biases and power structures inherent in our language, the article proposes a 'politics of resonance and prepositions' as a means of critically examining linguistic scales and power dynamics when discussing relationships between people, dance and plants.

In summary, the complementary perspectives on the language of resonance from literary, cultural and media studies may provide a more nuanced understanding of the interplay of human and plant responses as well the limitations of the interplay. The contributions in this Special Issue reveal the intricate relationships between humans and plants across different genres and explore how and under what conditions the radical ontological difference between humans and plants can be overcome and in what way a non-anthropocentric connection can be established. They present a multidisciplinary exploration of the concept of 'resonance' as a means to understand and describe the connection between humans and the plant world and advocate for a more equitable and ethical relationship with nature. We hope it promotes a deeper understanding of the many forms of communication and interdependencies between plants and humans and gives way to a broader 'grammar of the living'.

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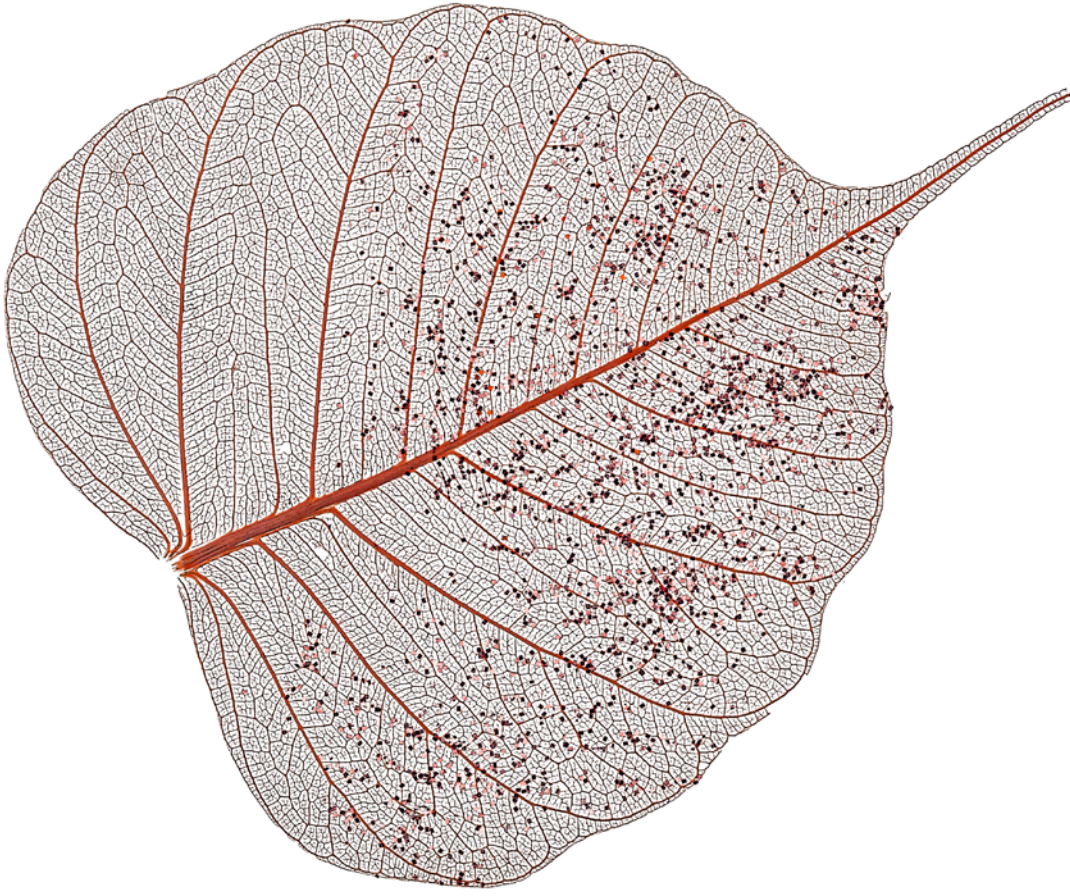
John C. Ryan

On Being Called by Plants: Phytopoetics and the Phytosphere



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ABSTRACT

This article brings the emerging ecohumanistic idea of 'phytopoetics' into dialogue with the established scientific concept of the 'phytosphere' to understand poetry concerning human-flora interdependencies. Developing a phytospheric framework, I analyse poetry of the root-soil interface (rhizosphere), leaves (phyllosphere) and plants' interior domain (endosphere). Countering a view of flora as passive, phytospherically contoured poetry foregrounds the agencies of plants within their multifaceted spheres of relation. I ground the article's theoretical assertions in an examination of the rhizospheric poetics of Louise Glück and Brenda Hillman; phyllosperic poetics of Ted Hughes and Kathy Jetn̄il-Kijiner; and endospheric poetics of Michael McClure and the Microcosms project. In addition to its ecological function, the phytosphere is a nexus of language propagation and catalyst of identification with vegetal life. Shaped by phytospheric delineations, contemporary phytopoems particularise plants, liberating vegetal life from the backdrop of consciousness and enabling the human to be called by plants in their own voices.

KEYWORDS

botanical sapience, endosphere, phyllosphere, phytosphere, plant poetics, rhizosphere

INTRODUCTION: PLANT POETICS AND THE PHYTOSPHERE

The world's literary traditions feature a diversity of poems elucidating the spiritual, aesthetic, moral, political and ecological importance of plant life. Focused on floristic lives, ecopoems of this kind consider the complexities of forests, grasslands, mangroves, trees, shrubs, bushes, vines, flowers, herbs and other botanical forms. As a case in point, nineteenth-century American poet William Cullen Bryant's lyrical 'To the Fringed Gentian' evokes the wetland species in celestial terms as 'Blue—blue—as if the sky let fall / A flower from its cerulean wall' (2006 [1829]: 73, ll. 15–16). Contrastingly, twentieth-century British poet Ted Hughes' thistles push determinedly skyward as they 'spike the summer air / Or crackle open under a blue-black pressure' (1973: 55, ll. 2–3). Hughes' tactile imagery evinces the thistle's vibrant material presence – its distinctive prickly foliage and multihued flower bracts. The intensification of Anthropocene

precarities (Tsing 2021), however, has provoked a marked shift in plant-focused poetry away from concerns of symbolism, aesthetics, morality and knowledge towards the urgencies of species survival in the face of cataclysmic environmental change. Yet, parallel to these pernicious threats lies a burgeoning body of research into plants' sentient capacities (Segundo-Ortin and Calvo 2022). As studies in the nascent field of vegetal cognition demonstrate, plants are not merely the inert, motionless objects of scientific deliberation but, on the contrary, exert their own percipient faculties to cope with environmental contingencies and maintain ecological interdependencies. Inherently polylingual, for instance, plants orchestrate electrical, acoustic and chemical signals to communicate within and across species (Gagliano, Ryan and Vieira 2017: 3–100).

In this context, phytopoetic theory foregrounds plant agency as a means to overturn longstanding denigrative perceptions of vegetal life (Jacobs 2019; Ryan 2020, 2023). The concept of 'phytopoetics' coalesces around three pillars: poetry, poiesis and praxis. As a botanically inflected ecopoetics, phytopoetics calls attention to creative productions that focus on the botanical realm, the lives of plants, human-fauna-flora interrelations and factors endangering botanical futures. Not delimited to literary texts, though, phytopoetics additionally signifies social, cultural, psychological and metaphysical praxes that attempt to integrate modes of existence specific to plants. Heterogeneous phytopoetic enactments, therefore, aim to work collaboratively with the wisdom of botanical life – or what I call 'botanical sapience'. In this sense, phytopoetics places emphasis on the potential for human becoming to entrain to the 'poiesis' – the dynamic transformation – of vegetal beings over time, across seasons and in places. Phytopoetics, accordingly, heralds a movement from the representational (in which language depicts a plant-object in the world and risks reinscribing human-botanical binaries) to the intermediational (in which language and communication, broadly construed, come to constitute a vibrant medium of interchange between sapient subjects). Rather than inert objects to be overwritten by the human hand and mind, plants thus contribute actively and integrally to diverse literary, cultural, social, political and intellectual domains (Ryan 2023).

The phytopoetic framework, consequently, recognises the basis of poetry, poetic thought and creative making in 'poiesis' – in concepts of becoming, bringing-forth, emerging and actualising (Ryan 2023). In

this regard, phytopoems function in manifold ways with respect to plant life, botanical justice and human-flora entwinements. Some phytopoems narrativise ancestral epistemologies of plants lying at the periphery of the dominant scientific paradigm (Neidjie 1989) whereas others integrate the technical language of botany exemplified by Linnaean hierarchies of families, genera and species (Costello 2021). What is more, some phytopoems experiment with speaking modes in which poet-narrators address plant-personae and, conversely, in which plants, as communicative subjects in themselves, speak back to their audiences in the first-(vegetal)person voice (Glück 1992, Murray 1992, Oswald 2009). Located within the phytopoetic ambit, as well, are writings that engender language-flora correspondences where poetic typography, for instance, evokes the embodied presence of living plants in particular habitats (McClure 1959, Glazier 2022). Beyond the narrow conception of phytopoetics as limited to poetry on the page, diverse modalities of plant-centric praxis such as art and performances synchronise human imagination and botanical sapience.

PARTICULARISING PLANTS AND POETRY PHYTOSPHERICALLY

Since the term's origins in the mid-twentieth century, ecologists have conceptualised the phytosphere in a variety of ways (Larcher 2003; Saito, Ikeda, Ezura and Minamisawa 2007; Svoboda 1989; van Elsas, Turner and Bailey 2003; Yang, Chen, Wang and Dai 2013). For Canadian arctic botanist Josef Svoboda (1989: 107), the phytosphere comprises the planet's vegetation as a whole in dynamic relation to the lithosphere (rocks), zoosphere (animals), homosphere (humans) and related ecological spheres. Svoboda foregrounds the effects of terrestrial plant emergence on the Earth's climate. Between 3.2 and 3.5 billion years ago, the advent of photosynthesis allowed plants to populate oceans and continents. To maximise nutrient production from light, terrestrial flora developed leaves, stems, branches, trunks and other prominent anatomies (Blankenship 2010). Then, approximately 400–500 million years ago, non-vascular land plants, comparable to mosses, drastically depleted atmospheric carbon dioxide, thus acquiring carbon and emitting oxygen (Svoboda 1989: 110). Prior to the appearance of terrestrial flora,

high atmospheric carbon dioxide ensured stable climatic conditions. Since then, however, fluctuations between warmer and colder periods have facilitated the evolution of complex life forms including terrestrial animals (Kalderon-Asael et al. 2021). The zoosphere and homosphere, therefore, have developed within the contours of the phytosphere. In this respect, Svoboda (1989) asserts that 'in this unique function of a food base and keeper of the oxidizing atmosphere *rests* the ultimate value of the Phytosphere in the hierarchy of identifiable physical realities' (111, italics and capitalisation original). Whereas Svoboda adopts an evolutionary stance on the phytosphere, Walter Larcher (2003: 10) conceptualises the term more broadly as a plant's immediate surroundings in which ecological transactions impact floristic life cycles. For other ecologists, furthermore, the phytosphere specifically comprises the interior and exterior of a plant, thereby forming an integrated microecosystem of aboveground and subterranean structures (Yang et al. 2013: 1).

More granularly understood, the phytosphere is a structurally diverse system comprising the rhizosphere, phyllosphere and endosphere. The rhizosphere is the soil habitat in proximity to the roots of a host plant whereas the phyllosphere is the microbial environment associated principally with foliar surfaces. In contrast, the endosphere is the microbiome within plant tissues (Saito et al. 2007: 94–95). Microbial ecologist Lorenz Hiltner devised the term 'rhizosphere' to denote the thin layer of soil serving as the substrate for roots' communicative secretions (Hartmann, Rothballer and Schmid 2008: 7). Hiltner noted that the microbial composition of the root zone significantly affects plant nutrition by rendering carbon, nitrogen, phosphate and sulfur available (van Elsas, Turner and Bailey 2003: 527). The 'wooded web' or 'wood wide web' – terms for the rhizosphere often used in popular science writing – catalyses information exchange within populations of plants as well as between plants and animals, insects, fungi, people and other organisms (Gross 2016: R182). In arboreal rhizospheres, for example, subterranean fungal systems known as 'mycorrhizal networks' facilitate forest memory. Symbiotic alliances with mycorrhizae supply trees with the energy necessary to activate memory processes that engage 'the diverse intelligence present among humans and forests' (Simard 2018: 197).

As illuminated by the case of the rhizosphere, the phytosphere is a nexus of signs operating symphonically to facilitate communication, memory and meaning-making in the more-than-human world. Within the articulations of the semiosphere, the phytosphere emerges as the groundwork of a particularising phytopoetics, or what Patrícia Vieira (2017) theorises as 'phytographia'. For Jesper Hoffmeyer (1996), the semiosphere directs expression, movement and sensation as well as electrical, chemical and thermal signaling (52–68). Towards consilience between the biological and linguistic, Hoffmeyer (1996) contends that 'the biosphere must be viewed in the light of the semiosphere rather than the other way around' (viii). For Hoffmeyer, the biosphere is first and foremost a semiotic terrain where organisms respond discerningly to ecological factors, engendering meaning in relation to neighbouring life forms (Harries-Jones 2016: 194). As a dialogical space, the semiosphere nurtures difference, reciprocity and mutuality (Lotman 2005: 216). Not only an epicentre of microbial activity, therefore, the phytosphere conceptualised in terms of the semiosphere becomes a matrix of mnemonic transmission characterised by 'diachronic depth' (Lotman 2005: 216). Consequently, ecosystems can be approached as coordinated semiospheres in perpetual states of information interchange.

'CONSCIOUSNESS BURIED': THE RHIZOSPHERIC POETICS OF GLÜCK AND HILLMAN

Phytopoems located in the rhizosphere draw attention, sensoriality and imagination downward into subterranean microecosystems. Critic Christy Wampole (2016: 24) observes that, not merely the material domain of the root, the rhizosphere is a plexus of communication, exchange and reciprocity between heterogeneous life forms. Rhizospheric poems, accordingly, emerge from both tangible and imagined contact with the root-soil interface through acts of planting, composting, tilling and tending. These features are notably salient in Louise Glück's 'The Wild Iris' (1992) and Brenda Hillman's 'To Mycorrhizae Under Our Mother's Garden' (2022). Whereas Glück's phytopoem narrates the activities of the poet-gardener from the perspective of a sapient iris, Hillman's speaker addresses the mycorrhizae of the substrata beneath her mother's garden. Engendering an ethics of care and cultivation,

practices of embodied participation in the rhizosphere prominently structure the phytopoetics of Glück and Hillman. Their work locates literary consciousness of vegetal life in this typically concealed component of the phytosphere. Through the coordinated extension of the body, intellect, senses, memory and imagination, the human becomes a participant in the subsurface domain where symbiotic interactions between soil, plants and microorganisms dominate.

American writer Louise Glück's titular poem from her markedly phytopoetic collection *The Wild Iris* (1992: 1) endows the common ornamental species with attributes of consciousness and memory. Embedded in the rhizosphere, the narrative directs attention upward to the barren winter garden perceived by the iris from below. Emerging from either bulbs or rhizomes, irises are perennial plants. Glück's immersive experiences in gardening in the New England region of the United States enabled her to become intimately acquainted with the growth cycles of the species (Ryan 2018: 135–62). In their perennialism, irises archive the mnemonic residues of each seasonal senescence and rebirth. Anticipating spring's appearance, Glück's iris exhibits corporeal memory of its interred condition. The lyrical narrator adopts the viewpoint of the subterranean iris apprehending the anemic light of the sun, the frenzied movements of birds in shrubs and the clanging of pine branches in the cold wind. Through heightened spatial awareness of transformations in the aboveground ecosystem, the iris endures, notwithstanding the constraints of its dormancy as a bulb:

> It is terrible to survive
> as consciousness
> buried in the dark earth. (Glück 1992: 1, ll. 8–10)

Glück figures the iris bulb as a locus of cognitive activity. Indeed, stanzas such as this accord with scientific articulations of visual, sonic, spatial and proprioceptive perception in plants (Karban 2017). Her rhizospheric outlook, moreover, harmonises with Charles and Francis Darwin's (2016) late-nineteenth-century assertion that the root system 'acts like the brain of one of the lower animals', coordinating 'impressions from the sense-organs' (419). The temporal expansiveness of perennial consciousness, however, contrasts acutely to the narrowness of human memory, declared by the iris-speaker's blunt characterisation of the poet-gardener as barren of the ability to recollect transitions

between worlds. The bold assertions of the iris typify the piercing directness of vegetal voice in Glück's phytopoetics.

Like Glück's 'The Wild Iris', American writer Brenda Hillman's phytopoems hybridise poetic and rhizospheric languages. 'To Mycorrhizae Under Our Mother's Garden' (2022) integrates the technical terminology of ectomycorrhizal fungi, hyphal tubes, glomalin proteins and N-rich molecules. Rather than the American New England grounding of Glück's phytopoems, Hillman's poetic voice evokes the botanical character of the American Southwest, specifically southern Arizona where she grew up. A representative member of the region's flora is the prickly pear, a cactus with a symbiotic relationship to arbuscular mycorrhizal fungi that penetrate its roots to bolster the drought tolerance of the host (Lahbouki et al. 2022). Whereas Glück's phytopoem features an iris-persona talking back insolently to the poet-gardener and reader, Hillman's ode addresses the fungal symbionts directly. Poetic imagination, accordingly, descends into the subterranean zone through the orientational clauses 'under her clothesline' and 'beneath feldspar' (Hillman 2023: n.p., ll. 5, 6). Alternating between macroscopic and microscopic standpoints, the speaker envisions the otherwise unfathomable mycorrhizal system subtending her mother's cherished garden:

> Nets of roots, fate-kept not-death fungal sheets,
> steady there, abiotic mediators, ones toward all.
>
> Crawling now whirred opened cells. (Hillman 2022: n.p., ll. 7–9)

Mutuality between psyche, garden and rhizosphere crystallises in allusions to the intertwined moods of fungi, molds and mother. The near-homonymic resonances of 'mold' and 'mood' position the phytospheric nexus sonically as a locus of healing – as a refuge for mending moods. Through biolinguistic figurations such as '[a]mpersands of storage compounds' and 'micro-essays / of endomycorrhizal' (ll. 18, 19), Hillman's phytopoetics demonstrates the rhizospheric sculpting of language—or what might be called the 'rhizospherisation of poetry'. Yet, while predominantly entrained to the rhizosphere, the lyrical narrator also summons the 'stomata, pores in leaves' of the phyllosphere, the subject of the next section (n.p.: l. 11).

'UNFURLING A GESTURE': THE PHYLLOSPHERIC POETICS OF HUGHES AND JETN̄IL-KIJINER

Phytopoems of the phyllosphere focus principally on leaves, leaf-habitat interactions and the cultural valences of foliage. Plants' leaf surfaces are unique microbiomes consisting of the phylloplane, the outer topography and the phyllotelma or exterior waterscape (Leveau 2019). Inhabited by bacteria, yeast, fungi, protists, algae and other microorganisms, the phyllosphere represents 'the above-ground homolog of the rhizosphere' (Lemanceau et al. 2017: 116). As a plant-microbe-habitat conjunction, the phyllosphere moulds resident microbial communities actively through the constant modification of its anatomical and chemical configuration. Recruiting phyllospheric microorganisms necessitates a communication network that the host plant can either disrupt or enhance strategically (Lemanceau 2017: 121). Mediated by molecular signaling, the network formed by the plant and allied creatures is known as a 'holobiont' (122). Composed in a phenomenological mode, phyllospheric poetry tends to emerge from intensive meditative observation of foliar transformation over time (Goethe 2009). These assertions manifest poetically in the vegetal subjects of Ted Hughes' 'Fern' (1973) and Kathy Jetn̄il-Kijiner's 'Basket' (2017: 4–5, 80–81). Notwithstanding their marked cultural and historical differences, the poetries of Hughes and Jetnil-Kijiner reflect a common interest in exploring the phyllosphere as a plexus of communication, expression, musicality, nourishment, healing and identity. In Jetn̄il-Kijiner's poems, furthermore, the narrator's tactile participation in the phyllosphere counters the detached aesthetic perception of foliage at a distance.

British poet Ted Hughes' 'Fern' (1973) opens with the immanence of phyllospheric encounter: 'Here is the fern's frond' (67: l. 1). Rather than conflating the plant with its foliage through the alternate phrasing 'fern frond', Hughes' choice of the possessive construction – 'fern's frond' – acknowledges the leaf as one organ among a multitude. As the dominant organ in ferns, fronds consist of a fiddlehead, or furled bud, and aerophore lines, or aerial roots for gaseous exchange (Vasco, Moran and Ambrose 2013: 5). Bearing neither seeds nor flowers and, instead, reproducing through spores, ferns require a specialised lexicon for botanists to differentiate their foliar anatomy from other vascular species. Not only photosynthetically active, fronds propagate the fern

vegetatively, disperse spores and nurture nitrogen-fixing bacteria (Vasco, Moran and Ambrose 2013: 4). Hughes' phytopoem evokes the frond actively as 'unfurling a gesture', a figuration connoting the phyllosphere's inherently communicative nature on the margins of the human's audible spectrum (67: l. 1). The alliteration of 'f's in the first line – 'fern's frond, unfurling' – reinforces the correlation between po(i)etic, or transformative, language and the plant's corporeal presence. Foregrounding plants' diverse gestural capacities as relatively sessile organisms, Hughes likens the fern to 'a conductor whose music will now be pause' (67: l. 2). Attuned to the plant's non-auditory expression, 'the whole earth dances gravely' (67: l. 4). Vegetal silence – the language of plants in the absence of speech – hence inspirits earthly choreographies. Later in the poem, the fern also dances 'gravely' like a warrior returning to his kingdom, a simile implying the plant's autochthonous belonging. At the same time, the fern's inspirited movement invokes European folklore concerning the power of fern seed to confer invisibility, a belief dramatised, for instance, by Shakespeare and Ben Jonson. Consequently, Hughes' fern is an ancestral literary subject rendered kindred in the po(i)etic present.

In Hughes' phytopoetics, embodied interaction with the phyllosphere precludes the possibility of detached observation of flora. Comparably, Kathy Jetn̄il-Kijiner's concrete poems – both entitled 'Basket' (2017) – centre on the Marshallese tradition of intimate sensory encounter with the phyllosphere through tactile practices of basket weaving (4–5, 80–81). Corporealising the matrilineality of Marshallese society, the term *iep jāltok* signifies 'a basket whose opening is facing the speaker' (Jetn̄il-Kijiner 2017: n.p.). The poem employs second-person address in referring to Marshallese women as well as to:

> dried
> strips of
> leaves. (Jetn̄il-Kijiner 2017: 4)

As a polysemous signifier, Jetn̄il-Kijiner's 'you' implies the interdependencies between leaves and weavers. Marshallese artisans use plants such as pandanus (*bōb*), basket grass (*wūjooj-in-ep*) and beach grass (*wūjooj kakkūmkūm*) to produce mats, baskets and other textiles (Merlin 2023). Signifying sustenance, fecundity, munificence and memory, the poems' oval mise-en-page summons *iep jāltok* as a botanical presence po(i)etically shaped by weavers' hands. In the second 'Basket', however,

the imperialist appropriation of the Marshall Islands promulgates the exploitation of women, land, sea and flora. The friction between proliferation and desecration concretises visually in the basket's elongated form where the more pronounced spacing between words implies the weakening of *iep jāltok* as a cultural vessel. A prominent sense of resilience, nonetheless, materialises in both poems through nourishing gestures of swelling, offering and keeping that are set in sharp distinction to defiling colonialist behaviours of scraping, dumping and littering. Affirming the value of tactile interaction with the phyllosphere, the baskets and their constituent plants enhance the recuperation of Marshallese identity. The rejuvenation of phyllospheric cultural traditions, indeed, depends on the revival of weaving practices in tandem with broader biocultural conservation strategies (Hiraishi 2018). Consequently, the phytopoetics of Jetn̄il-Kijiner and Hughes illuminates the process of perceptual extension into the phyllosphere engendering contact and dialogue between plants and people while recognising ontological divergences. Practices of becoming familiar – and familial – are comparably central to endospheric poetry, the focus of the next section.

'WHEN THE FOREST MOVES ABOUT ONE': THE ENDOSPHERIC POETICS OF MCCLURE AND *MICROCOSMS*

In contrast to rhizospheric poetry of the root-soil interface and phyllospheric poetry of the leaves, endospheric poetry directs the human sensorium to the interior of plants. The endosphere is a site of microorganismic transactions as well as plant communication via chemical compounds, electrical signals, and other means. From an ecological perspective, the endosphere supplies an internal habitat for bacteria, fungi, yeast and other microorganisms known as endophytes that colonise plant tissues while minimising harm to their hosts (Compant et al. 2021: 1812–13). To be certain, transactions between plants and endophytes confer benefits to both (van Overbeek and Kari Saikkonen 2016: 231). Co-evolving with their hosts, microorganisms regulate vital processes such as photosynthesis, transpiration, stomatal control, nutrient uptake, osmoregulation and stress adaptation (Rho and Kim 2017, Sarkar et al. 2021). Communication between endophytic colonies and the host, moreover, increases the production of secondary metabolites

coordinating plants' interactions with other organisms (Khare, Mishra and Arora 2018: 7). Examples of endospheric poetry include Michael McClure's 'Point Lobos: Animism' (1959) and the non-textual, collaborative and transdisciplinary project *Microcosms* by Jill Pflugheber and Steven F. White (2023). Positioned within the endosphere, the poetry of McClure evokes vegetal interiorities. Although a work of endospheric visualisation rather than poetry per se, *Microcosms* forges an optical language for generating engrossing depictions of the innermost topographies of sacred flora.

American poet Michael McClure's 'Point Lobos: Animism' (1959: 4–5) oscillates fluidly between plants' endosphere and its external environment. McClure foregrounds the collective voice of plants experienced as a felt presence animating place. Drifting between the microscopic inner and the macroscopic outer – between the endosphere and the biosphere – the poem simultaneously tracks between the possibility and impossibility of sacramental union with flora. McClure's visceral phytopoetics co-implicates human and botanical physiologies as the poetic self recollects kneeling by a salt pool, awakening to the 'soul like a clambering / Water vascular system' (4: ll. 26–27). The term 'vascular' here interinvolves the human circulatory system with the xylem and phloem tissues transporting water and nutrients in land plants. At the same time, McClure's endospheric diction evokes the vegetal soul as an expression of the internal poiesis of vegetal life. The inner-outer dyad, however, reverses as the narrator declaims the impracticality of speaking of lupines and tulips after one witnesses the magnitude of:

> His name
> Spelled by the mold on the stumps
> When the forest moves about one. (McClure 1959: 5, ll. 38–40)

In other words, in the contact zone between human and more-than-human bodies, the conventions of signification break down. As the forest engulfs the narrator, particular plants (lupines, tulips) meld into the vegetal whole (ecosystem, forest). Instead of the human extending into the endosphere, the botanical collective internalises the human – 'the forest moves about one'. The exclamatory line 'Light. Light! Light!' then calls urgent attention to photosynthesis as the outcome of multitudinous beings in transformative interchange (McClure 1959: 5, l. 42). Endospheric in emphasis, 'Point Lobos: Animism' is also

macroecological in its attention to the intricate relationalities between place, people, plants and other beings. As comparably legible in Glück's 'The Wild Iris', subjectivity in McClure's phytopoem becomes destabilised as bodies, minds, sensorialities and languages intertwine.

In a comparable vein, biologist Jill Pflugheber and literary scholar Steven F. White's web-based project *Microcosms: A Homage to Sacred Plants of the Americas* (2023) visualises the endosphere normally excluded from the human purview. At the conjunction of plants, art and consciousness, the project aims to heighten public appreciation of sacred species through the development of an innovative technological process. To generate endospheric visualisations, the researchers employed confocal microscopy – short for confocal laser scanning microscopy – an optical technique for the three-dimensional imaging of plant interiority. The confocal method produced vivid depictions comparable to multicoloured works of abstract art. *Microcosms* navigates the inner worlds of more than seventy species regarded as sacred by Indigenous cultural groups of North and South America. One plant featured in the project is sweetgrass (*Hierochloe odorata*), known as *Óhonte Wenserákon* in the Mohawk (*Kanien'keha*) language and *Wicko'bimucko'si* among Chippewa people. Native North Americans use sweetgrass for basketry, healing, smudging and myriad other purposes (Kimmerer 2015). A confocal representation of the species features organic purple forms suspended over the plant's green interior topography. Towards an endospheric poetics, *Microcosms* elucidates the vital importance of sacred flora as well as Indigenous people's enduring relationships to ceremonial plants. Engendering consilience between diverse forms of knowledge, the project merges technical and scientific spheres with their poetic and spiritual counterparts. The inclusion of the term 'homage' in the project subtitle, furthermore, signifies respectful acknowledgement of kinship with the plants with whom humankind participates in symbiotic exchange at every moment of consciousness. As a non-textual example of creative engagement with the endosphere, *Microcosms* reinforces this article's earlier assertion that phytopoetics should include poetry on the page in addition to heterogeneous creative makings imbricated with vegetal poiesis.

CONCLUSION: ON BEING CALLED BY PLANTS

I have argued that poetry of the rhizosphere, phyllosphere and endosphere illuminates plants' responsive, expressive and percipient capacities as agents. Phytopoetics encourages us to refuse and rethink the backgrounding, denigration and fetishisation of plant life. Through concerted attention to heterogeneous spheres of botanical being, the phytopoetic framework offers perceptual and linguistic resources for rendering plants identifiable to human perception while preserving their incontrovertible differences. The floristically focused poetry of Glück, Hillman, Hughes, Jetn̄il-Kijiner, McClure and *Microcosms* exemplifies the widening of the botanical imagination and transforming of dominant narratives of life on Earth in response to the precarities of the present including threats to botanical futures. Preserving vegetal alterities within processes of meaning-making, phytopoetics both familiarises and defamiliarises us with botanical life, summoning us into plants' particular domains – the root-soil interface of the rhizophere, the foliar topography of the phyllosphere and the internal terrain of the endosphere. This felt experience of being called to take part in the variegated material and sensorial worlds of plants can provoke us to challenge the predominant social construction of plants as passive beings devoid of communication, behaviour, learning, sensing, memory and other faculties associated with intelligence. If poetry is the poietic, or transformative, process of bringing the human subject back into the world's fold – of being interpellated by earthly things – then phytopoetics signifies our being summoned by plants. As we participate critically and corporeally in their multidimensional transactions with other creatures, we come to realise that plants embody adaptive resilience and express the wisdom of more-than-human life. Inspired by botanical sapience – by the wisdom of flora as individuals and collectives – we must consider plants, human-vegetal relations and phytospheric poiesis in order to enhance the long-term wellbeing of ourselves and others.

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Plant Parts: Vegetal Tropes and their Phytopoetic Resonances Across Botany and Culture

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ABSTRACT

While the natural sciences and the humanities were not always as separate as they appear today, language has connected them inextricably throughout history. Terminology for plant parts such as root, leaf, stem, flower and fruit have been operative across disciplines both as references to actual vegetal matter and as tropes that carry and continue to take on new metaphorical, allegorical, symbolic and topological meanings that go beyond the strictly botanical. By exemplarily examining five such tropes, this article maps these discursive networks of meaning and their phytopoetic resonances, showing how plants have shaped human thought and culture.

KEYWORDS

cultural plant studies, plant parts, vegetal tropes, phytopoetics, resonances

We have all dissected a plant before. It might not have been with a blade or physical force, but language is a sharp instrument that can take apart a plant and isolate it into leaf, stem, root, flower and fruit. In reverse, *pars pro toto*, the literary device in which a part stands in for the whole, can turn a flower or fruit into a representative for the entire plant. The relationship between parts and wholes is unique when it comes to plants because they can survive the removal of one of their parts with much more ease than other living beings. In fact, for many plants, cuttings, fission, fragmentation and other kinds of (re)moving a piece of vegetal matter are successful forms of asexual reproduction.[1] While plants are not mobile in the sense of choosing a new place to put down their existing roots, their modular bodies nonetheless allow

1 See Jacobs, 'Plant sexuality'; Jacobs and Seymour, 'Asexual ecologies'; Sandford, *Vegetal Sex*.

for a certain mobility that would be fatal for other living organisms.[2] Questions that are central to animal ethics or human philosophy, such as the boundaries of the individual, resist easy transfer to plants, and the idea of whole- or completeness in plants is quite complicated.[3] This article therefore turns to plant parts both as matter and concept. Tracing the terminology used to describe plant parts from botany to literary tropes, it shows how language ties together thought and development in these supposedly disparate areas, resulting in discursive networks of phytopoetic resonances.

But what exactly are phytopoetic resonances? In the context of this Special Issue, resonance (*Resonanz*) has been defined in reference to sociologist Hartmut Rosa as

> a relationship of mutual response, whereby a subject is affected by the world (in this case the plants) by perceiving them in their otherness and strangeness. This can be linked to the current discussion on a New Nature Writing (Lilley 2017), in which the work on a 'language of resonance' (Malkmus 2020) plays a central role. Deep attention in the perception of nature allows us to experience worldly connections beyond the human (Goldstein 2019). The focus is thus less on the question of an intelligence or sensuality of plants but an on opening of the human senses to the multifaceted signs of nature in order to listen, read, understand and make them accessible in the medium of human language.[4]

Related to this notion of resonances in the particular sense of non-humans affecting humans, I have elsewhere defined phytopoetics as the impact of plants on the human imagination, showing its effect in

2 Even if plants might not choose new locations actively, they are nonetheless agents of mobility, as cultural history shows (see Pollan, *The Botany of Desire* and Mancuso, *The Incredible Journey of Plants*), and many species, such as pea plants or *Mimosa pudica*, move body parts actively (see, for instance, Calvo with Lawrence, *Planta Sapiens*; and the work of Monica Gagliano at https://www.monicagagliano.com/).

3 In the context of emerging cell theory in the nineteenth century, German botanist and natural philosopher Alexander Braun emphasised that the plant is a *dividuum*, a divisible being, in contrast to the animal and human in-dividual. The term is also a potent concept in philosophy, anthropology, sociology and literature (see exemplarily Raunig, *Dividuum*). In *Die Stufen des Organischen und der Mensch* (*Levels of Organic Life and the Human*, 1928), philosopher and sociologist Helmuth Plessner located plants, animals and humans on three levels of life according to their boundaries and positionalities, characterising the plant's form both as 'realizing its boundary' and 'open', which raises complex questions about parts and wholes that are addressed in more detail in Gelderloos, *Biological Modernism*.

4 Dürbeck and Lu, 'Networks of plants and language of resonance'.

literature and culture.[5] This concept draws attention to the non-human agency in the resonant relationships that humans can have with nature, and it 'opens the human senses' not just to the 'signs of nature' writ large, but to some of their specific creators: plants. Developed in analogy to the notion of zoopoetics in animal studies, which entails the role of animals in the production of literature, phytopoetics describes moments in which plants co-create cultural artifacts, such as literature, or bring about cultural change.[6] In the context of my research, I have focused mostly on plants shaping how humans think, talk and write about sexuality and gender since the eighteenth century, looking at literary texts but also cultural shifts such as curricular censorship and legal reform, to point to the ways in which plants have been affecting the human imagination, which has often affected them in return.

While Rosa conceptualises the German term *Resonanz* in the singular as a specific relationship between the self and an other, 'resonance(s)' as both a countable and an uncountable English noun can have a range of meanings, which aptly highlights the multiplying effects I see emerging from the concept (this is also why I use it in the plural here). To cite Rosa in his own words:

> Following its Latin etymology, resonance is first and foremost an acoustic phenomenon – 're-sonare' meaning *to resound*. As we have seen through the example of the two tuning forks, it describes a specific relationship between two vibratory bodies whereby the vibration of one body prompts the other to itself vibrate in turn. If you strike one tuning fork in close proximity to another, the second will begin to vibrate at its own frequency. … Resonance is produced only when the vibration of one body stimulates the other to produce *its own frequency*.[7]

Resonances literally resound, and phytopoetic resonances thus create a discursive network of multiplying meanings that can change human understandings of self and vegetal other. As such, phytopoetic resonances are effects of resonant relationships and experiences with plants in language and culture (and, here, the focus is on plants in their specificity, intentionally not subsumed under nature as part of a whole).

5 Jacobs, 'Phytopoetics' and '"These lusting, incestuous, perverse creatures"'; see also related concepts in Ryan, 'Writing the lives of plants' and 'Phytopoetics'; and Vieira, 'Phytographia'.

6 See Moe, *Zoopoetics*; Driscoll and Hoffmann, *What is Zoopoetics?*; Middelhoff, Schönbeck, Borgards and Gersdorf, *Texts, Animals, Environments*.

7 Rosa, *Resonance*, p. 165.

Phytopoetic resonances are traces of discursive shifts or multiplicities in human thought brought about by plants, which this article locates in the way the botanical names of plant parts become operative as literary tropes, symbols and metaphors through languages and cultures (and the reverse direction), so that understandings of terms such as leaf, root, flower, stem and fruit multiply across different disciplines and discourses.

Before turning to the aforementioned plant parts in detail to trace their phytopoetic resonances, I would like to point to some of the work in plant studies that has inspired my thinking both methodologically and conceptually. Together with literary scholar Isabel Kranz, I am currently completing editorial work on *Pflanzen: Ein kulturwissenschaftliches Handbuch* (*Plants: A Cultural Studies Companion*) forthcoming with Metzler in German.[8] The *Companion* analyses the role of plants in culture, showing how integral they are to human flourishing. Its over forty entries made me see phytopoetic resonances everywhere, in the form of multiply layered discursive networks that expanded my understanding of how much plants have been shaping human language, expression and thought across centuries. In keeping with the idea of multiplication across a network of resonant relationships, this article is therefore indebted to a community of scholars and their research, compiled in the *Companion* and other work this article points to in its footnotes, and at times also coming together in the Literary and Cultural Plant Studies Network.[9] This article connects some ideas that emerged for me across the entries, without duplicating the in-depth analysis the entries present for their own arguments, while also adding different concepts. While the *Cultural Studies Companion* focuses predominantly on Western and at times specifically Germanophone contexts, phytopoetic ideas operate across many languages and cultures (whether destructively or constructively), and mutually imbricated processes of translation further

8 The *Companion* consists of four sections: 'Von der Morphologie zur Trope' (From morphology to trope), 'Kulturtechniken' (Cultural techniques), 'Räume des Wissen' (Spaces of knowledge) and 'Muster und Modelle' (Patterns and models). In this conceptual organisation that originated predominantly with Isabel Kranz, plant parts fill the first section, while the second turns to actions such cultivating, collecting, communicating and curing. The spaces in the third section range from the garden and the forest to the desert and outer space, while the last focuses on ways in which plants have served as models for artistic and pedagogical expression, such as the herbarium specimen, glass flowers and time lapse film.

9 See https://plants.arizona.edu and also Jacobs and Kranz, 'Einleitung'.

complicate one definitive understanding of plants or their parts. In the following pages, I turn to five plant parts in a series of brief vignettes, moving from leaf to root, then stem to flower and finally fruit.

LEAF

While travelling in Italy, German poet and naturalist Johann Wolfgang von Goethe penned a now famous sentence among his notes that has come to be understood as the premise of his botanical treatise *Metamorphose der Pflanzen* (*Metamorphosis of Plants*, 1790): 'Alles ist Blatt' or all is leaf.[10] While Goethe's botanical work aimed to prove that all plant parts develop from the leaf, or are variations thereof, which makes the leaf presumably both a part and the whole of the plant, the quote has taken on a life of its own that has just as much to do with the leaf as it does with the 'all'. Both literally and figuratively, all can mean everything, and this comprehensive idea of wholeness has made it a nearly universal signifier that continues to be quite popular. In examples named after Goethe's dictum, such as Giovanni Frangi's 2014/2015 exhibit of paintings, John T. Price's wide-ranging book of essays from 2022 and Tamas Dezsö's recent photographs, installations and sculptures, the distinct concept of the leaf, typically associated with ideas such as green, photosynthesis and plant, becomes 'all' and can suddenly represent planet and climate, cosmos and future.[11] In other words, the oft-cited 'all is leaf' has gone far beyond plant morphology, and it did so already in Goethe's work itself, which famously combined the form of the botanical treatise with poetry. Not unusual at a time in which natural philosophers such as Goethe simultaneously pursued several disciplines that are considered separate today, the poetic description of the part as a whole adds aesthetic and philosophical dimensions to the botanical understanding of his work.[12]

10 Goethe, *Schriften zur Morphologie*, p. 84.

11 Frangi, *Alles ist Blatt*; Price, *All Is Leaf;* Dezsö, 'Hypothese: Alles ist Blatt'.

12 Research on Goethe is of course vast, but see exemplarily Axer, Geulen and Heimes, *Aus dem Leben der Form*, Axer and Shields, 'The seed of an idea'; Bies, *Im Grunde ein Bild*, 'Staging the knowledge of plants' and '"Imagine a green plant shooting up from its root"'; Holmes, '"Beweglich und bildsam"'; Sullivan, 'Goethes

But leaf does not merely equate to 'everything'; rather, its specific meanings beyond botany are at the core of reading and writing. In English, you can leaf through a book, whose folio format is reminiscent of the Latin word for leaf (*folium*) and fall foliage, while pages are *Blätter* in German, *feuilles* in French, or φύλλα (*phylla*) in Greek. *Blatt*, the German term for leaf and page, brings together plants and reading, botany and literature, and it references the vegetal material from which writing paper is made. Reading, writing and even painting – human culture is unthinkable without plants.[13] Helga G. Braunbeck's entry on the leaf in the *Companion* expands on these cultural connections and their phytopoetic resonances across time. And indeed, the term for leaf is also central to other contexts that sustain humanity, such as baking and cooking, where lettuce, wine and vegetable leaves share the kitchen counter with sheets of dough (*feuilles*, phyllo/filo, etc.) – coming together with other plant parts to form new wholes. As the leaf is central to plant sustenance through photosynthesis, which in turn produces oxygen, it also synthesises both material and mental nourishment for humans – thus reminding us of the source of life.

ROOT

Scientific discoveries about roots have perhaps drawn most popular attention recently in the context of the so-called 'Wood Wide Web', the root system of forests that points to their interconnected community. Here too, questions of nourishment and communication intersect, though some of the conclusions drawn about what mycorrhizal root-fungi networks exchange have lately been called into question.[14] Regardless, roots have made for a potent literary trope long before these headlines and bestsellers, and related concepts like the rhizome

Metamorphose der Pflanzen' and 'Goethe's "leaf" and scales of the Anthropocene' as well as other entries in the 'The philosophical life of plants' project blog.

13 See exemplarily Aloi, *Why Look at Plants?*; Kranz, Schwan and Wittrock, *Floriographie*; McHugh, 'Plants and literature'; Middelhoff, 'Thinking and writing with leaves'; Nitzke, 'Arboreale Poetik'; Nitzke and Braunbeck, 'Arboreal imaginaries', Ryan, 'Writing the lives of plants'; Vieira, 'Phytographia'.

14 See Karst, Jones and Hoeksema, 'Positive citation bias'; Robinson et al., 'Mother trees'; Simard, *Finding the Mother Tree*; Wohlleben, *The Hidden Lives of Trees*; but also Wankhammer, 'Anthropomorphism, trope, and the *Hidden Life of Trees*'.

by Deleuze and Guattari have galvanized philosophy (in such robust ways that they received their own entry in the *Companion* by Georg Toepfer). As Johannes Wankhammer shows in his contribution about roots, rootedness is a concept associated with home and belonging, and hence an interconnected community, though it takes on a range of connotations, depending on the cultural context. While *Wurzeln* (roots) and *Verwurzlung* (rootedness) associate the same in German, their connection to soil (*Erde* or *Boden*) also conjures up the problematic 'blood and soil' (*Blut und Boden*) rhetoric of the Nazis, which tied belonging to one's place of origin and considered diasporic communities homeless.[15] The individual's longing to be part of a whole is violently rejected in contexts like these, which are intertwined with experiences of uprootedness in the form of flight, exile and migration.

While roots often appear in the plural and share strengths and weaknesses of/as a collective, the legend of the mandrake focuses on one root that is grown into an individual. Whether it is Hanns Heinz Ewers's *Alraune* (*Mandrake*, novel 1911, film 1928) or the *Harry Potter* series of the late 1990s and early 2000s, mandrakes feature readily in literary works and their cinematic adaptations, and the plant of the nightshade variety was already associated with fertility in the Bible.[16] Both aphrodisiac and poison, the mandrake is about reproduction as much as horror, as it is said to spring from the semen or other bodily fluids of hanged men and to let out blood-curdling screams when uprooted, which is why legend advises to let a starving dog pull it out.[17] Since mandrake roots bear a visual resemblance to human bodies, here the part is the whole, at least according to the ancient doctrine of signatures, which held that a similarity between the shape of a plant (part) and a human body part indicates its medicinal use.[18] With its loud screams,

15 See exemplarily Stehle, *Plants, Places, and Power.* In other cultural contexts, roots and soil evoke anti-colonial rhetoric: see exemplarily DeLoughrey, 'Yam, roots, and rot'.

16 See Fleisher and Fleisher, 'Fragrance of biblical mandrake'.

17 See Carter, 'Myths and mandrakes'.

18 The doctrine of signatures (*signatura rerum*) was widespread in various cultural and historical contexts (though Paracelsus is often named as the most prominent proponent) and suggested, for instance, that beans might help with kidney ailments, given their similar shape, or walnuts might support brain health. See exemplarily Böhme, *Signatura Rerum*.

the mandrake speaks to us humans, not just as a literary topos but also literally, thus phytopoetically calling attention to the unsettling admixture of violence and eroticism in our (hi)stories.[19]

STEM

A stem branching out is both a literal and symbolic sign of growth. A branch is the next generation, and while it is younger, weaker and protected by less hardy bark than the stem, it grows in its image. The tree of life has represented this principle of kinship and generation in the biological sciences at least since Darwin, as Christina Becher also pinpoints in her contribution to the *Companion*, and a *Stammbaum* (family tree, or literally stem-tree in German – an inversion of tree stem, *Baumstamm* and related to the word for tribe, *Stamm*) has translated this representation of evolutionary connections onto the local level of ancestry, albeit not without the problematic side effects of physiognomic pseudoscience and racialised eugenics.

While the root could be uprooted and lived on in the form of the mandrake, the branch cannot seem to trunk-ate its connection to the tree without cutting off its supply of nutrients – it would need to grow its own roots. Yet it can nonetheless 'branch out' to make new connections and diversify, as branches can be grafted onto different trees and thrive. When discussing parts and wholes in his *Kritik der Urteilskraft* (*Critique of Judgement*, 1790), Kant presents such a 'Pfropfreis auf einem anderen Stamm', a graft on another stem, as a parasitic appendage.[20] This understanding of grafting has been deployed in racist, antisemitic and ableist allegories, and it is connected to complicated genetic ideas of breeding and eugenics. Yet grafting can also be thought of as a way to sustain other plant parts without grown relations.[21] Parts can be exchanged to create new combinations, as the image of grafting foreshadows at the beginning of Goethe's *Wahlverwandtschaften* (*Elective Affinities*, 1809). In the present, this opens up possibilities for creating community and

19 Jacobs, 'Phytopoetics'.

20 Kant, *Kritik der Urteilskraft*, §64.

21 For more on grafting, see the contributions in Wirth, *Pfropfen, Impfen, Transplantieren*.

families of choice that are not tied to biological relations and ancestry.[22] Phytopoetic resonances thus remind us that wholes can make room for new parts and, as various parts come together, they make a new whole.

FLOWER

Flowers are mostly gendered feminine, both grammatically (*la flor*, *la fleur*, *die Blume* – to give just a few examples from gendered languages) and as tropes or symbols. Their colourful beauty and alluring scents have evolved to attract pollinators (as this plant part only exists in flowering plants), making blossoms not the head, as often imagined, but the botanical genitals of plants. When sexual reproduction in plants was discovered and popularised by Linnaeus's taxonomical system, it led to moral outrage, since the discovery of promiscuous pollen trading upended a long-held association of women and flowers as supposedly asexual creatures.[23] This botanical revelation resulted in waves of literary satire about the fear of vegetal eroticism and an anxiety about human 'parts'.[24]

Yet flowers, the part of the plant associated with courtship and love, have been sending such signals in various cultures for centuries. Whether in the form of love poems, the Victorian Language of Flowers that supposedly allowed you to encode secret messages, or the use of violets as a sign of recognition among lesbian women, flowers 'speak' and 'write', as Isabel Kranz shows in her contribution to the *Companion*.[25] Saying it *durch die Blume* or 'through the flower' is a synonym for encoded metaphorical speech itself, and simultaneously one of the most literal takes on phytopoetic resonances. The association of flowers with women also had a violent underbelly, such as the notion of defloration expressed in the images of J.J. Grandville's *Les fleurs animées* (*The Flowers Personified*, 1830) and lingering in Goethe's poem of 'Das Heideröslein' ('The little

22 See Jacobs, 'Eden's heirs'; Mortimer-Sandilands and Erickson, *Queer Ecology.*

23 See George, *Botany, Sexuality, and Women's Writing*; Schiebinger, *Nature's Body*; Shteir, *Cultivating Women, Cultivating Science*; Taiz and Taiz, *Flora Unveiled.*

24 See Jacobs, 'Plant parenthood', 'Phytopoetics' and '"These lusting, incestuous, perverse creatures"'.

25 See also Bataille, 'The language of flowers'; Kranz, 'The language of flowers'; Kranz, Schwan and Wittrock, *Floriographie*; Gagliano, Ryan and Vieira, *The Language of Plants.*

rose on the heath', 1771/1789), who pricks the boy trying to pick her – and even slurs for gay men like 'pansies'.[26] This plant part often seems to overshadow the others in a *pars pro toto* manner, and the flower circulates for its aesthetic value, both materially and metaphorically.

FRUIT

Fruit is the result of successful pollination and carries plant seed together with nutrients. What botany calls fruit is not always what is understood as such in common usage, since corn, bell peppers, cucumbers, beans and many more are erroneously classed as vegetables in the kitchen. Fruit's varied appeal to the senses takes us back to the nourishing and life-giving qualities of plants. As it holds the plants' seeds, fruit is a symbol of fertility, yet it also signals consumption, marking both an end and a new beginning. Being fruitful is associated with multiplying, and this expansion of the family tree or *Stammbaum* soon requires finding space for many new wholes – or are they just new parts? In the seed and the plant, questions of the origin and the original arise.

Fruit is also the most mobile plant part, due to human intervention, even though it often requires agriculture and settlement for its beginnings. Fruit travels through trade, and it has fuelled exploration and exploitation in the form of violent domination, plantation slavery and war.[27] Fruit as a plant part can be disconnected from its whole to such a degree that not everyone can picture the plant on which a pineapple grew or how new varieties of citrus are made – signalling the geographical and cultural zones it traverses to be called by the problematic moniker 'exotic', as Stephan Zandt details in his contribution to the *Companion*. As such, fruit has also become synonymous with capitalism, since the fruitful (re)produce. In this way, the banana became a symbol of the limitless access to goods and wares after the Fall of the Wall in the newly unified Germany.[28] Both apples and oranges can tell world history, yet they remind us that, if we focus only on one part, we might

26 See Jacobs, 'Rose'; Heinemann, 'Fucking pansies'.

27 See Haraway, 'Anthropocene, Capitalocene, Plantationocene, Chthulucene'; Klein, *Fruits of Empire*; Tuck and Yang, 'Decolonization is not a metaphor'.

28 Soluri, 'Accounting for taste'.

be missing the whole story.[29] In the same sense, networks of phytopoetic resonances bring together different worlds.

PARTS AND WHOLES IN THE DISCURSIVE NETWORK OF PHYTOPOETIC RESONANCES

Plant parts and wholes bring together recurring themes of reproduction, sustenance, community, communication and culture. As the leaf makes it possible to write down the history of someone's roots, trace the branches on a family tree, compose flowery poetry, or calculate the fruits of people's labour, plant parts are more than botanical specimens. Plants saturate human thought, the imagination and, most importantly for discursive networks of phytopoetic resonances, language. In doing so, they phytopoetically take part in the ongoing creation of culture, as the previous examples have shown briefly and exemplarily. The modularity of plant matter allows for an engagement with the many aspects of plants in isolation and, indeed, not all parts of the plant exist at all times or simultaneously, as botanical illustrations traditionally suggest. The circular, seasonal development that turns a seed into a stem with roots and leaves will eventually produce blossoming flowers that hold the promise of more fruit. Such a multiplication of parts leads to new wholes, just as the multiplication of meaning across these terms creates phytopoetic resonances across different disciplines, times and cultural contexts. Of course, we can also further dissect plants, dividing these parts into their ever-smaller ones, such as stamen, pistil, sepals, petals, pollen in a flower. We can also scale up our understanding of wholes into forests, meadows, fields and other landscapes – or nature writ large. Ultimately, the relationship of the part to the whole and vice versa is both a material and a conceptual one, showcasing the rich and vivid discursive networks of phytopoetic resonances across botany, literature and the everyday.

29 See Mazzoni, *Golden Fruit*; Pollan, *The Botany of Desire*.

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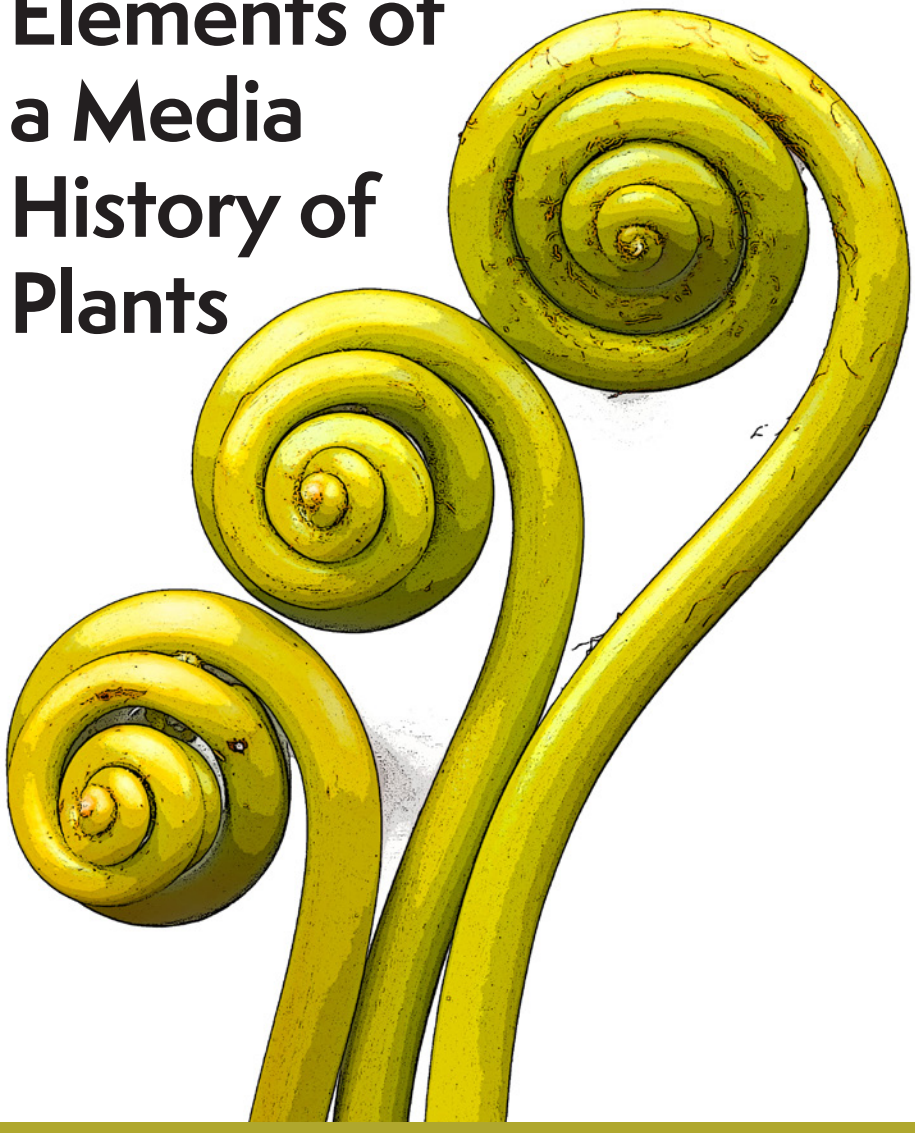
Birgit Schneider

Becoming Media: Elements of a Media History of Plants



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ABSTRACT

Plants communicate with their fellow species, but also with other species. The communication of humans with plants, in turn, represents an old phantasm that is intended to lead to contact with the seemingly mute creatures. This article revisits the history of plant cognition from a media theory perspective. The article questions the extent to which media and electricity have historically been and are currently *leitmotifs* for entering into resonance with plants. The focus is on media-historical and science-historical approaches that have conferred to plants the ability to communicate and on current sensor interfaces through which plants are turned into sound in media art. The article argues that, whenever media technology makes plants 'speak', what the human listener actually hears is the medium, not the plant, because it is a human construct.

KEYWORDS

media theory, information theory, plant cognition, sonification, communication, media art, listening.

This article investigates the resonance relationships between humans and plants. It draws on sociologist Hartmut Rosa who presented the concept of resonance in 2016, in a time during which detachment and alienation from the environment are often felt. In this context, resonance refers to 'being in touch' or 'tuning in' to a counterpart. Resonance is the promise of a 'deep' connection that not only evokes rational understanding but also touches the heart and the body. In relation to plant life, the question arises as to how a mutual understanding in the form of resonance between two very different realms of living beings is possible. If the understanding is based on a romanticised definition of nature, it would mean that humans might be instrumentalising plants for their own resonant imaginary. If it takes the form of communication known to information theory – the mathematical study of the quantification, storage and communication of information – a broad concept of language independent of human speech is needed. In the following, I will advance the topic of plant communication through references to media theory, the history of science and media art towards the direction of plants becoming media. This will allow me to discuss the extent to

which resonance relationships belong to people's longing for immediacy and connectedness and also to identify when these longings for resonance ultimately come to nothing. There will be a shift in the meaning of the term 'resonance', which I will also use in its physical dimension. Resonance, as I see it in play with plants, is an electrical connection through oscillation. It is only through the human imagination and its capacity for empathy that this can be felt as resonance in Rosa's sense. Whenever media technology makes plants 'speak', what the human listener actually hears is the medium, not the plant.

PLANTS IN NETWORKS

Several years ago, roughly 70,000 trees in Melbourne, Australia, were each assigned an email address so that people could write to the individual trees about how they observe and perceive a particular tree (LaFrance 2015). In Europe, as part of a recent initiative called *TreeWatchNet*, a number of trees were linked up via sensors that enabled them to transmit data on their growth and sap flow via WiFi, but also to 'tweet' with the assistance of an interpreter (Schneider 2018). The tweeting trees in the TreeWatch network speak English and in full sentences saying things like the following:

> 'I am a Scots pine (Ø = 26.1 cm) in Germany (Britz) in a forest of the Thünen Institute of Forest Ecosystems.'
> 'My sap has started flowing!' 26 May: 'Today I have grown 0.037 mm, transported 2.7 L of water at a maximum speed of 0.3 L/h.'
> 'My sap is stopping to flow for today. The maximum speed was 0.2 L/h.' 28 May: 'During this warm day (max 26.7°) I lost 114 L of water and my max sap flow was 9.4 L/h – tough day.'

While it has always been completely normal for trees to 'talk' in the world of fables and fairy tales, it appears today just as normal for plants as for humans to be digitally linked and in regular communication with each other. However, these talking trees in our digital era of global communication do not become part of some kind of Internet of (lifeless) Things. Instead, they are prompted to speak as active members of a social media ecosystem. The secret life of trees or the language of plants – both are book titles that (again) attract large readerships in the world today.

Before situating the study of plant communication in its historical context, I would like to introduce a thought that allows us to very clearly frame the question of how we might possibly communicate with plants – that is, by approaching the subject from the perspective of xenolinguistics (Vakoch 2024). Indeed, questions such as 'How might we speak to an alien?' and 'What might an alien language sound like?' can be directly applied to the subject of plant communication. When we think of the types of communicative exchanges that are capable of transcending the boundaries between species and entities – for example, as thematised most impressively in the 2015 film *Arrival* – it becomes clear that, at least in a very reduced form, a language only needs two properties, namely a channel and a sign transmitted via that channel. Speculations as to how we might be able to communicate with extraterrestrials often continue in this vein – i.e., extraterrestrial languages don't necessarily have to be audible or based on alphabetical or logo-graphic elements; they can just as easily also consist of the transmission of light or chemicals.

The model of communication associated with the information theory of Claude Shannon and Harry Nyquist developed in the 1920s and 1940s used electrical telegraphy as model. When an electrical line is free of interference, two people or technical systems can send and receive messages, provided they know the codes.

Today, it is considered scientific fact that plants are able to orient themselves in their environments in many different ways. Research has shown, especially in recent years, that plants communicate via numerous channels in a chemical, olfactory, electrical and optical manner, not only with other plants, but also with other living creatures, such as insects, birds, mice and fungi (Baluška et al. 2006).

If plants communicate, the question arises as to which concepts and terms we should use to describe plant behaviour. This discussion follows debates surrounding the definitions of 'intelligence', 'consciousness', 'memory', 'will' and 'decision' in the fields of biology and plant physiology, while many plant researchers favour less loaded vocabulary such as plant sensitivity or plant awareness (Trewavas 2003, Chamowitz 2012). The question here is whether these concepts are understood narrowly – i.e. zoo- or even anthropocentrically – or independently of the nerve networks as an abstract principle of cognition, as the philosopher Michael Marder (2013) has developed with the term 'extended plant

cognition' in his seminal book *Plant-Thinking. A Philosophy of Vegetal Life,* rejecting the disputed term 'plant intelligence'.

The model of technical communication devised by Shannon and Nyquist is so universal that biologists were able to apply it to their own fields of research. For example, biology uses the term 'communication' to describe the internal '(sign-mediated or signal) interactions' within the plant as well as with other organisms.

The founding tome of *Cybernetics*, published by Norbert Wiener in 1948, also contains a universal model of communication that explicitly includes all living creatures, even though the book is titled *Cybernetics: Or Control and Communication in the Animal and the Machine*. Indeed, Wiener's information theory encompasses the ability to receive and organise impulses as a 'fundamental property of living matter' (Wiener 1985: 124). As we know, the descriptive language of cybernetics applies not only to machines but also to living organisms. Wiener primarily uses his theory to define animals and technical sensor systems as 'sense organs' (e.g. 'hydrogenion-potential recorders, which may be said to taste', Wiener 1985: 42), which he considers equivalent to the nervous system. At the same time, he ultimately concludes that all these processes 'lend themselves very well to description in physiological terms' (Ibid., 43). Through this perspective, one could expand the realm of cybernetics to the biology of plants as well. This had two effects. Within biology, it helped to successfully explore and describe the ways in which plants process many different kinds of signals. At the same time, it led to technical media settings that were detached from science and more oriented towards popular discourse, based on the claimed possibility of establishing a direct interface for plant-human communication.

In what follows, I will touch on the history of media-shaped imaginations and research on plant communication that for decades that placed a kind of *electrical apriorism* on that research. 'Resonance', in this context, is an effect of electromagnetic waves. This approach was rooted in a particular understanding of electrically conductive channels and their translation into electromagnetic curves. In other words, we must recognise and acknowledge the inherent electrical bias within the communication analyses and models from the twentieth century, which can be referred to as an *electrical a priori*. This bias becomes particularly evident in the pseudo-scientific plant experiments of the 1960s and 1970s, most of which were carried out based on motives from the fields of

control engineering and communication technology. In the context of these experiments, several US engineers connected plants to electrodes and galvanometers, not so much with the intention of establishing a connection with nature, but rather to utilise plants as conduits for the reception of human thoughts and emotions. The pseudo-scientific experiments of Cleve Backster, a lie detector specialist, who was later seen as highly problematic for the public relations of plant cognition research, were very influential for the public notion of plant communication. His work represents the great public fascination with plant-human-communication through technical media devices, which remains true in our own times of increasing ecosystem loss. An example is the advent of devices such as 'Plantwave', an app that sonifies surface tension data taken through sensors from different (mostly potted) plants around the world and translates the data to ambient music via the app. Users of the app can tune into different plant data as if to a plant radio station. Starting with examples from art, I will interrogate bio-sonification in general. Then I will briefly outline the historical context in which the early experiments took place and summarise current findings in plant research that are important to understanding the limits of media-technological approaches to interacting with plants.

THE PLANT AS MEDIUM IN ART

Today, there are countless works of art drawing on the idea of plant communication, many falling into the category of 'BioArt'. Following calls for a perspective that de-centres humankind in favour of something more-than-human, a number of artists are using bio-signals, especially the visualisation and sonification of signals, as a way of making it possible for us to experience the 'language of plants'. Most of these works of art prove the success of the 'Backster effect', as I will call a typical media-technological set-up after the most notorious and popular experimenter in the 1960s and 1970s. One by one, electrodes are attached to a potted plant, registering voltage fluctuations in their leaves or roots triggered by the activities of the plants themselves. The dynamic activity pattern of the plant controls the pattern of the acoustic signals.

There are many works by artists who have been experimenting with this type of basic plant-media over the past decades. An early work

of interactive media art under the title *Interactive Plant Growing* by Christa Sommerer and Laurent Mignonneau from 1993 encourages participants to control the mathematical generation of artificial plants on a video screen by means of touching potted plants. As museum visitors stroke five real tropical plants in their pots standing on pedestals, they witness the effect of their manual interaction in growing green tropical plants on a large video screen. The room is extremely dark, as is the background of the bright green generated plants on the screen, which seem to be growing in a jungle at night. At the same time, the dark environment is very unnatural for the plants and the question arises as to how long the plants will survive under these conditions. The viewer's attention is focussed on the feeling in their hands and the sight of the rapidly growing plants on a canvas filling up with leaf structures before their eyes.

Musician Miya Masaoka employed potted philodendrons connected to electrodes for her composition *Pieces for Plants* (2000–2012). By connecting the plants to her computer, the set-up allowed her to play the philodendrons as if they were a theremin. In her performances, the artist can be seen sitting on a floor amidst a multitude of cables, gesticulating with her hands over the plants in sweeping movements, while synthesiser buzzing noises can be heard. She regards this set-up as a way to give 'voice' to the plants, their electrical activity and their physiological response to its surroundings, as she says on her website (http://miyamasaoka.com). The title *Pieces for Plants* seems to promise that the plants will be able to perceive the music. This could mean that the plants perceive the live music and the activities of the musician at the same time and change their electrical activity as a result, which would be a typical feedback situation.

A comparable approach is taken in the work *Acousmaflore* (2007) by the group of artists known as Scenocosme; museum visitors are invited to change the electrostatics of dozens of commercially available plants like *Epipremnum aureum* (money plant) hanging from the ceiling in pots. By touching them with their hands they produce different minimalist and synthetic sound patterns. The sound is reminiscent of pearly patterns of small bells. The three examples have in common the role given to human interaction. A plant-human-machine interface is the condition under which aesthetic experiences become possible. Whether it is the plant that the recipients or 'users' hear and see here is, however,

questionable. It almost seems as if they are reaching into the void in their longing for a heartfelt connection with plants.

Today, such plant-media assemblages not only exist in museums, but also in commercialised form. Today, at *Plantwave*, the company of the app that was already mentioned, one can purchase a small device that converts the electrical intensities of the plants in real time in a non-stop stream of sparkling melodies and rhythms, ultimately promising to 'tune into nature through plant music' (plantwave.com). Resonance in these media assemblages is made possible by connecting the surfaces of the leaves and transferring their changing tension in relation to humidity either analogue or digitally to a technical interface that transforms them into sound. The sonic result is influenced by the artist's choices and the functionality of the medium.

Sonifying plants is not a new approach. In fact, the possibility of aesthetically translating the 'Backster effect' from waves into sounds had already been explored by the media artists in the 1970s in the US, as both media scholars Teresa Castro (2019, 2020) and Verena Kuni (2020) have pointed out. The experimental musicians and artists John Lifton, Tom Zahuranec, Jim Wiseman and Richard Lowenberg used plants' electrical signals to produce video and audio sequences. This group of artists combined plant signals with signals coming from their own electric activity measurements based on their brain and muscles. To achieve this convergence, they connected their bodies to the cutting-edge medical diagnostics tools of electromyography (EMG) and electroencephalography (EEG) (Kuni 2020: 18). The performance took place in 1976 over the course of four days at the Conservatory of Flowers in San Francisco's Golden Gate Park.

Watching the video of the performance today, it seems to resonate very successfully. The interconnectedness of people and plants suggested by the work was expressed particularly in the bodies of the performers. A woman stood holding a sensor in her hands, with her eyes closed, as two female dancers performed an expressive dance made up of convulsive movements, moving to the sounds and among the plants. Here we see the extent to which these electronic experiments were embedded in a context which, rather than focussing on increasing mechanisation, sought to explore the potential of spiritual experiences by means of hypnosis, trance and psychoactive substances. It also sought to engage in a 'new-age yearning for wholeness' and against 'the decay of a successful

relationship to nature caused by modernity', as noted by Stefan Rieger and Benjamin Bühler (2009: 61).

It seems that these approaches are relevant again today because the approaches of the different media artistic pieces relate well to the current calls for decentred, more-than-human perspectives. The resonance that can be observed in response to the artworks shows much about the expectations of technical media, which reveal hidden worlds by making them perceptible. At the same time, the question arises as to whether the output of such connections is a possibility of experiencing resonances with a plant at all, or rather only with the technical medium. Maybe the answer lies in the 'ear of the beholder'. If the resonance is only in relation to the technical medium, then the experience might actually be another form of 'hungry listening' or 'listening for'. Dylon Robinson used this term to name a colonising, differentiating, standardising and consuming mode of listening, in contrast to a listening in relation, a 'thinking-feeling' of 'listening with three ears' (Robinson 2022: 50, 51). Approaches that appear to enable new perceptions in order to transcend the nature-culture divide must be viewed critically. This is because they always threaten to focus on the latest technical media and thus distract from a new perception of nature.

CURRENT INSIGHTS IN THE FIELD OF PLANT PHYSIOLOGY

When using sensor technology and electrical circuitry to sonify plant responses, it is important to contrast this with what is currently known about how plants communicate and sense their environment. Recent progress in the field of plant physiology has compelled us to formulate a fresh perspective on plants (*Pflanzenbild*), a refined rendition of our conception of humanity (*Menschenbild*). Indeed, the last three decades have seen paradigm-shifting discoveries that would certainly fulfil the criteria of a scientific revolution as defined by Thomas Kuhn because they have proven the assessment of plants as more or less passive living beings without the ability to perceive their environment to be a misjudgement.

Plants do not have nervous systems, which is why they must process sensory perceptions in other ways. Internal plant communication takes place via the vascular system, which uses electrical but also hydraulic

and chemical signals for the various plant systems, for example, from the roots to the leaves via vascular systems. Electrical signals close the stomata of the leaves when there is too much sun; electrical impulses activate plant movements, such as the closing of blossoms and leaves, including the jerky contraction of mimosa leaves.

Plant physiology describes the numerous organs plants use to perceive the world, whereby it is assumed that there are at least fifteen senses for plants. Here, the focus is less on sensitivity to light and the ability of roots to find particularly nutrient-rich areas of soil; instead it is primarily on the cells located on the surface of plants from which they gain 'information about their environment … and communicate with each other' (Mancuso and Viola 2015: 56). The so-called stomata are usually found on the underside of leaves and act as odour receptors via molecules called BVOC (biogenic volatile organic compounds). There are over 8,000 known terpenes and over 30,000 of the closely related terpenoids. These chemical signals can be used to communicate dangers, such as pest infestations, but also to send out attractants to friends and foes. This occurs, for example, when flowers use their scent to attract pollinators tuned precisely to seek out these odours. When under attack, plants inform neighbouring plants – but also flora located further away – about the approaching danger via scent signals through the air. This allows their fellow plants to arm themselves defensively by releasing bitter enzymes that render their leaves inedible and/or poisonous within a very short time, as is the case of the umbrella acacia, the lupine and tomato plants. In the same vein, trees can tell by the saliva of insects whether they are harmful to them or not – and subsequently take the appropriate precautions.

The air and wind are not the only channels that serve as key routes for plant communication. Recent research in the realm of forest ecology, and especially the work of Suzanne Simard, has shown that roots in the soil also function as conduits for plant communication. For example, a single pine tree can be linked to hundreds of trees of different species via symbiosis with the subliminal network of fungi and mycorrhizae. This network serves the purpose of providing mutual nourishment, but also the equally important exchange of those abovementioned biochemical signals – i.e., terpenes and BVOC molecules – which are crucial in warding off tree species that have been classified as intruders and to warn of some impending danger. Trees are also able to recognise the

degree to which they are related to their neighbours, and this allows them to provide particularly well for their own offspring.

The final realm of bio-communication is one we've known about the longest, largely due to the fascinating forms of mimicry involved. Most plants require animals to be able to reproduce. This means that clear and unambiguous communication is an essential element to the survival of all those plants that produce offspring solely by means of allogamy (*álios*, meaning foreign, and *gámos*, meaning union). The result is the emergence of a veritable 'flag alphabet', precisely adapted and coordinated by plants to communicate with the couriers of their fertilisation such as insects (entomophilous), birds (ornithophilous) and bats, hummingbirds, primates and reptilies (chiropterophilous). For example, the Cuban climbing plant *Marcgravia evenia* produces blossoms in the shape of satellite dishes so that they can be heard by their pollinators, i.e., bats, via echolocation. In contrast, other plants send out targeted misinformation as a way of attracting their pollinators. Orchids, for instance, are known for the masterful mimicry they use to attract their pollinators whereby these signals are categorised as either 'deceptive' (e.g., orchids) or 'honest' (e.g., the lupine, which turns blue after pollination).

At this point, it is necessary to call attention to the fact that traditional aesthetics are organised according to the five human senses. Anyone who chooses to address the *aisthesis* of plants, however, will soon understand that these five human senses are inhibiting factors when it comes to recognising and imagining non-human forms of cognition.

PLANT COMMUNICATION WITH PEOPLE AND MACHINES

Plants do communicate, but they do so through distinct codes and channels. They establish connections not only within their own biological processes but also with other forms of life. Plant researchers are therefore obliged to point out, time and again, the extent to which the conception of plants that has prevailed in the Western world since antiquity serves to block new ideas from forming, even in the face of inexplicable observations.

Turning to the scientific history of plant research, Darwin's initial observations of perplexing plant behaviours, which he described in detail in his books from the 1870s and 1880s, underwent further examination

(Darwin 1875, 1880). The exploration leveraged new methods from psychological research – specifically, the integration of chart recorders. These methods, referred to by Etienne Jules Marey (1878) as 'the language of the phenomena themselves' (III), unveiled a new dimension of understanding. The realisation that such a language of phenomena could also be elicited from plants through electrical means wasn't brought forward by a Western researcher. Jagadish Chandra Bose**,** an Indian natural scientist (1858–1937), spearheaded extensive research on the electric response of plants towards the close of the nineteenth century. Employing self-made instruments in his laboratory, Bose delved into the intricate relationship between plants and electricity. He was the first to establish the responses of plant cells to electric stimuli as well as the conductivity of signals, and he published widely on the subject. However, as plants were considered to be purely chemical and mechanical things back then, his research left many people unconvinced. The fact that plant cells do possess electrical conductivity was only ultimately proven in the 1990s (Wildon et al. 1992: 62–65).

Bose's plant experiments didn't make him famous in Europe or the US back then. Instead, it was in the 1970s that an electrical engineer, Cleve Backster, gained fame there – especially through a very popular book. The early research into plants using tools associated with electrical engineering as well as the experiments undertaken in the 1960s were described in *The Secret Life of Plants*, a highly popular book published by Peter Tompkins and Christopher Bird in 1973. The book also promoted Bose's research as a pioneer in building instruments to study plant physiology through electricity. It made the *Times* bestseller list and was followed up by an experimental documentary film with the same name. It solidified the idea that plants are more than just inert and unresponsive entities, embedding this understanding deeply within the American cultural memory. Yet another notion that established itself at the time was the image of plants as organisms whose signals could be elicited from them by means of electronic devices.

Backster wasn't a biologist or scientist, but a lie detector expert who worked for the CIA. The psychoanalysator or 'polygraph' he used for his experiments was the standard lie detector of the CIA, except that its electrodes were now hooked up to a plant. When Backster began his experiments, he didn't pay attention to choosing specific plants, but opted for the ubiquitous, ordinary plants found in almost every office

setting, most notably the philodendron and the dragon tree. The polygraph measured the electrical resistance that changed with the degree of humidity. In other words, the cultural context of the research was truly different from that of Bose, who belonged to the Unitarian Brahmo fraternity in Calcutta, where Hinduism regarded plants as spiritual beings with unique souls that possess healing powers, sometimes even embodying sacred gods (Das 2023). Changes in the electrical voltage gradient of plant cells were displayed as a curve deflection and drawn as a line on a continuous tape. Backster's set-up seemed to prove that plants can also 'pass' a lie test, an assertion that has become firmly entrenched in popular memory.

If I concentrate on Backster's experiment, it is not because he played any role in plant research, but firstly because his experiments met with an enormous response from the public at the time, and secondly because Backster's general electrotechnical set-up continues to recur in new guises in the arts to this day, as in the examples I described at the beginning of this article. His experiments are embedded in the history of fascination that weaves into the framework of biological plant research. He became the point of reference for many media artists, who realised art works for the public – for example Miya Masoaka relates her work to Backster directly – where there is a vague longing to come into emphatic contact with plants, or even to exchange signals or at least to make the plant's signals perceptible, realised in the paradigm of the electrical *a priori.*

After numerous further experiments, Backster concluded that plants display 'a quality of awareness and an empathy to other organisms' (Tompkins and Bird 1973: 33). This is the moment at which the highly charged nature of Backster's credibility as an CIA-agent and lie detector specialist becomes clear in his role as the man who was finally able to 'reveal' plant language and truth. Indeed, the electrodermal reactions of the polygraph became forensic tools able to reveal a 'secret message', with Backster claiming the authority of the expert who could interpret any response pattern. This authority was based on the cultural myth that a lie detector test was 'unbeatable' and scientifically objective. The evidence was driven by the ritual of the test in the context of the intelligence services and the experts' interpretive authority.

Backster was not alone. Tompkins and Bird list many other protagonists from the fields of electrical engineering who experimented with

plants and auto-suggestion but who also used plants as receptors for intelligent signals from outer space and to harness the telepathic abilities of plants. Many presented their research at the Society for Cybernetics in 1972 as evidence of the transmission of a new energy form called 'bioplasm' (Tompkins and Bird 1973: 52–59). What becomes obvious is that all the experiments carried out in this period were closely related to the control engineering and cybernetic machines of the 1960s and 1970s, that is to media technologies.

It wasn't biologists, but rather electrical engineers and people claiming to be spiritual mediums who were using plants as biosensors for electromagnetic fields in the realm of bio-cybernetics, the attempt to use information theory and system theory to understand how biological systems 'function'. The fact that these experiments combined paranormal interpretations with modern technology meant that their findings were not published in journals of natural science, but rather in engineering journals with titles such as *Popular Electronics* and *Electronic Worlds*, or in para-psychological journals, such as *International Journal of Parapsychology*.

ELECTRO-TECHNICAL MEDIA AND THE 'BECOMING-MEDIUM' OF PLANTS

In all these experiments and in the mentioned artworks or apps, the key status of electro-technical communication media is clear. How can we best evaluate this connection? As Verena Kuni (2020) writes, the plants were 'perceived and modelled as media' (3, 5). They were turned into technical interfaces through electric circuiting making their signals accessible for visualisation or sonification methods. The film and media scholar Teresa Castro (2019) summarised the experiments in Backster's context using the terms 'mediated plant' and the 'queering of botanics' (n.p.) as a way of grasping the familiar rational notions of life and consciousness that had been challenged by these kinds of plant experiments. Although this effect might be true, I wouldn't go all the way with this interpretation, because it seems to repeat the idea that it's actually the plant that's being mediated.

What speaks against the idea of a queering is the fact that human feelings and thoughts stood at the centre of almost all the experiments.

The envisioned resonance between humans and plants tied to the myth of the infallible lie detector and the potential control through human will (a form of 'brain control'), loses its enchantment. This paradigm bears resemblance to the *E-meter* devised by L. Ron Hubbard, the founder of the Church of Scientology, who similarly employed the polygraph as a strategy to objectify 'emotions' and allow their subjective interpretation. This use of the polygraph is illustrating yet another instance of the creative interpretation of 'spurious correlations' in the form of lines which, in this case, make visible the electrical resistance of the human skin. A media theoretical assessment of the plant experiments within Backster's framework prompts enquiries into the instrumental role of plants in the experiments to recreate the human senses. The recurrent observation arises that the trembling deflections of polygraph needles conveyed less the feelings of the plants and more the thought-after human states of arousal within the plant's signal. The essence wasn't primarily about understanding plant sensations or consciousness; instead, it revolved around transforming plants into technical mediums capable of sensing and discerning 'human' thoughts and states of mind.

In these experiments, the role of plants emerges as something media theory has called – drawing on Gilles Deleuze and Félix Guattari – the 'becoming-medium' (Vogl 2001: 115–23). In this process, which Vogl exemplifies with Galileo's telescope, media don't simply expand the senses, but invent the senses in a new way. The telescope deleted the idea of 'natural seeing' and replaced it with a new artificial mode of perception, a 'denaturalization of the gaze' (116, translated by the author). And these instruments installed an 'elemental self-referentiality' (Ibid.).

This characterisation applies to most of the electro-technical plant experiments carried out in the late 1960s and the 1970s, rooted in the desire to transform plants into interconnected media within an electrical circuit. Notably researchers integrated the latest communication technologies of their time into their experiments, which, crucially, enabled plants to function as media in the first place. Against the backdrop of the electro-technical plant experiments sketched above, it is essential to recall the foundational aspect common to all these experiments – the galvanometer or polygraph. Restricted to a two-dimensional signal (time and Hertz), this device registers only the frequency of repeating processes in a periodic signal, resembling more a temperature curve than the richness of human language or music (cf. Rieger and Bühler 2009:

63). The signal to which all hopes of plant communication via feelings are attached is, therefore, notably feeble. Media historians Stefan Rieger and Benjamin Bühler (2009) emphasise that the excitement lies not just in deriving voltage differences but, more importantly, in how they are processed: 'It is the language that speaks, not the human being – or, in this case, not the plant' (Ibid.: 64).

LISTENING IN MORE-THAN-HUMAN WORLDS

In times of a global ecological crisis – diversity loss and climate crisis – new ways are sought to relate to ecology and nature. Listening is one mode by which to relate to species under the threat of a changing climate. Artist Marcus Maeder, for example, has worked in the field of eco-acoustics for many years. He translates his research into sound installations for museums. In his piece *Perimeter Pfynwald: A Soundscape Observatory* (2019), audiences can listen to the reinforced clicking sounds of a pine tree recorded during a period of drought and heat stress and relate the sounds to sonifications of meteorological data, measured in synch. The sound patterns are complex and hard to understand, but after a while they reveal the relation between changes in the environment and the clicking sounds of trees, who unsuccessfully try to pump up more water through their trunks. Art historian Yvonne Volkart wrote about the piece extensively in her book *Technologies of Care: From Sensing Technologies to an Aesthetics of Attention in a More-than-human World* (2023). Art works like Maeder's are often promoted as ways to make perceptible the impacts of climate change, but also as ways of listening to plants, opening up for new relationships of care. Volkart interprets this understanding going deeper and offering a way to reflect on the experiments of this chapter again:

> The fundamental sound, which transports the mood at the same time with interval-like flickering rumbling noise, is 'voice,' neither something human nor 'saying' anything. The listener only has the 'feeling' that it comes from deep down and far away and is ancient, a kind of earth tone or spirit. This indeterminacy leads to a permanent tension that is not resolved. The listener, or perhaps better experiencer, 'feels' that the forest represented here, which they hear and see and feel resonantly, is a body, a living being. That it is. They move in its terrain; they are affected by its mystery. Although Perimeter Pfynwald accomplishes these sound evocations entirely without narration and suggests, at least

> aesthetically, the information design of science or pedagogy, the atmosphere has something mythical about it, recalling in us non-modern knowledge in which the forest does not represent an outside, but is part of the body. At the same time, the artificiality of the sound, of the voice, conjures up a cyborg, something hybrid. The forest being, the forest body, the forest here is natureculture.

Feeling, understanding, listening and caring for living creatures across human species is much more complex than the idea of 'making plants speak'. The concept of queering here is linked to the figure of the cyborg, which shifts the understanding of a 'natural' relationship with plants.

It is true that current research is unlocking the way we think about plants. Language is crucial here, because it, at the same time, limits and opens up ways of understanding. If we say that we listen to the 'voice' of plants, we are applying an 'anthropomorphising' or 'animistic' inclination. The same is true for many books that have popularised the idea of plant intelligence successfully during the last years like those by Stefano Mancuso or Peter Wohlleben. This inclination is not confined to popular writing, but also manifests in the scholarly works of professional researchers such as forest ecologist Suzanne Simard or biologist Monica Gagliano. Potawatomi botanist and writer Robin Wall Kimmerer calls attention to the strict ban on anthropomorphising vocabulary in biology. At the same time, she calls for animistic approaches to nature to overcome the objectifying paradigm of Western thinking that separates humans from nature (Kimmerer 2013: 48–59). This is because a ban on the use of an anthropomorphic vocabulary is not neutral.

> As ecological thinkers have pointed out for a while, a systematic blindness to the enmeshment of human and non-human worlds stands both at the origin of global ecological crises and in the way of developing collective responses to them. As a result, we find ourselves in a situation where deeply entrenched critical reflexes are beginning to fail us and a critical habitus founded on exposing anthropomorphism in all its guises has become fundamentally questionable. (Wankhammer 2017: 143).

Gagliano refutes accusations of anthropomorphism (and unscientificness) and advocates for the 'plantifying' of our imagination concerning ourselves and all living creatures. The focus lies not on the metaphysical implication of anthropomorphism, but rather on the definitions of fundamental concepts intricately connected to the human image, such as language or cognition.

Resonance, if it is not 'hungry listening', in this context, can be a process of tuning in. Gagliano (2018) describes her research and her plant-centric writing as an 'attunement' (6). This concept diverges significantly from the electrical experiments of Backster and his successors. According to Gagliano, 'the human is a listener who filters out personal noise to hear plants speak, who engages in active dialogue with these non-human intelligences, which are far more real than our current scientific constructs allow us to contend with' (Ibid.). She further elaborates, emphasising the genuine act of listening involves feeling the other as we encounter them: 'This availability to truly listen by feeling the other as we meet is not empathy, which bears upon the other in order to rediscover himself – a form or narcissism that makes the other a sort of imaginative variation of the empathizer' (17). As the boundaries between the realms of plants and humans, plants and the media, science and poetry become increasingly blurred, the challenge is to develop a sense of critical awareness and care.

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Interspecies Entanglements. Plant History and Racial Theory in Georg Forster's Essay *Vom Brodbaum* (*On The Breadtree*, 1784)

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ABSTRACT

This article focuses on the strained legacy of colonial botany and plant trafficking in the context of European expansion and colonisation. 'Interspecies entanglements' refers to the relationships of power, knowledge, accumulation, commodification and desire that are perceptible when humans talk about plants in the framework of colonialism. The example I take is the breadfruit tree (*Artocarpus altilis*), a member of the mulberry family dispersed widely across the Pacific, which was famously transplanted from Tahiti to the Caribbean in the 1790s. After elaborating its journey through cultural discourse (first as 'bread of the Gods', then as 'food for slaves'), I focus on German naturalist Georg Forster's essay, titled *Vom Brodbaum* (*On the Breadtree*, 1784). My underlying contention is that, while Forster redresses some damning stereotypes and misconceptions relating to the Pacific cultures, his interest in race and the attendant hierarchies places a question mark over the integrity of his scientific engagement with human and plant knowledge alike.

KEYWORDS

breadfruit, colonial botany, Pacific, Georg Forster, race

INTRODUCTION

A dazzling, large-scale floor installation, consisting of a mirrored floor punctuated by thousands of tiny stars, awaits the visitor to Daniel Boyd's exhibition *Rainbow Serpent* (*Version*) (2023) at Berlin's Gropius Bau. Inside the exhibition, 45 paintings drawing on a range of visual source materials, from Joshua Reynolds' famous *Portrait of Mai* of 1777 to ethnographic images and family photographs, interweave a complex semantic and semiotic web, connecting themes of indigenous spirituality, the natural world and the impact of settler colonialism in Australia and the wider Pacific region. One of the paintings, rendered in Boyd's signature style of overlaying dots on the surface using archival glue, depicts a Polynesian man carrying a branch of breadfruit. In the same room, a portrait satirically titled 'Sir No Beard' (2009) casts British botanist Joseph Banks as a pirate (complete with token eye-patch); just beyond that, a doorway leads to an image of the *Bounty*, the ship that under Banks' auspices attempted – albeit unsuccessfully – to transport breadfruit tree

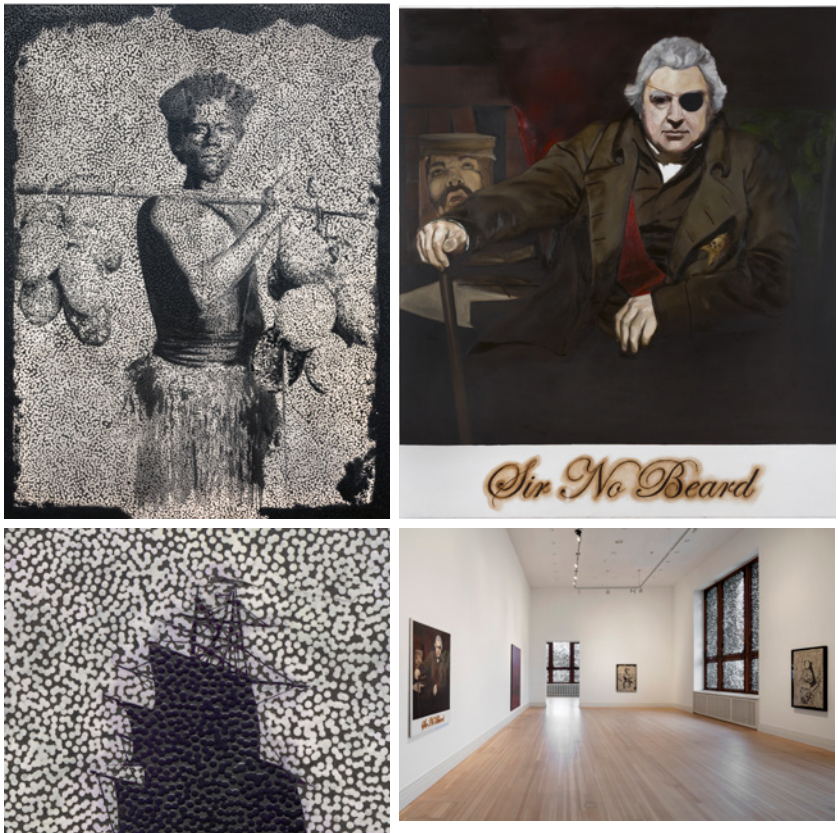

FIGURE 1.

Clockwise from top-left: a) Daniel Boyd. 2017. *Untitled (BGTJS)*. Ink and archival glue on polycotton. 273 x 213 cm. Courtesy of the artist and Roslyn Oxley9 Gallery, Sydney; b) Daniel Boyd. 2009. *Sir No Beard*. Oil on canvas. 153 x 137.5 cm. Courtesy of the artist and Roslyn Oxley9 Gallery, Sydney; c) Daniel Boyd. 2021. *Untitled (FFITFFF)*. Oil, acrylic and archival glue on canvas. 76 x 61cm. Photo: Chunho An. Courtesy of the artist and Kukje Gallery, Korea; d) *Daniel Boyd: RAINBOW SERPENT (VERSION)*. 2023. Installation view, Gropius Bau © Gropius Bau. Photo: Luca Girardini.

specimens from Polynesia to the Caribbean in the 1780s.[1] Together, the three works invoke a distant, yet defining moment in history when 'botanical colonisation' (Mastnak et al. 2015) through plant trafficking and colonial botany represented a potent technological apparatus that displaced people, as well as biota, and radically altered ecosystems and societies in the process.[2]

In the context of the growing interest of literary and cultural studies in the potential for greater 'resonance' between plants and humans, this article explores the complex interplays between science, culture and power in Europe's imperial expansion and colonial botany that has without doubt been the source of great *dissonance* in interspecies and intercultural relations for centuries. In doing so, I am inspired by feminist and indigenous scholars working in the field of science who have elucidated some of these historical dissonances, showing, for example, how colonial empires systematically relied on appropriating Indigenous peoples' botanical knowledge and transferring plant specimens to Europe (Brockway 1979, Schiebinger 2004), while at the same time 'the natives' were marginalised as 'savages' who had no significant impact on pre-Columbian and pre-Cook ecosystems (Kay and Simmons 2002: xi). Engaging with this complex and contested terrain, my focus is on the plant that Boyd's recent Berlin exhibition featured for good reason, as it in many ways typified the European enterprise of colonial botany and bioprospecting: the breadfruit tree. Europeans crossed oceans, defied climatic odds and orchestrated complex schemes in an effort to reap the economic benefits of this tree (known scientifically as *Artocarpus altilis*), a member of the mulberry family. Yet, beyond economics, my interest lies in the *interspecies entanglements* between human and plant – that is, in the relationships of power, knowledge, accumulation, commodification and desire (Sandilands 2016: 227) – that accompanied the breadfruit's migration from one side of the globe to another. Transgressing cultural as much as geographical boundaries, so-called 'migrant' and 'invasive species' rarely conform to their culturally ascribed ontology as 'natural things', instead becoming eminently cultural and political and, as

1 The *Bounty* did not complete its voyage and, following the mutiny instigated by the ship's crew, was burned in January 1790 at Pitcairn.

2 See Crosby 1986, 2003; Grove 1996; Drayton 2000; from a literary perspective, see Bewell 2007.

researchers have shown, oftentimes instrumental to hierarchies based on gender, indigeneity, race, sexuality and nation (Harding 2008, Philip 2004, Shiva 1997). What does the breadfruit's unique, yet also all-too-familiar, story have to say about the politics of colonial botany and planting, and what lessons might be gleaned towards recuperating a language and culture of human-plant resonance in the twenty-first century?

At the centre of my analysis of the breadfruit's journey through cultural discourse is the work of German writer and naturalist Georg Forster (1754–1794). Known for his involvement in Captain Cook's second circumnavigation of the globe (1772–1775), Forster was not so much involved in the activities of imperial trafficking as in studying the breadfruit tree, transforming it from a curiosity into a fully-fledged object of scientific inquiry. Forster authored a lengthy essay specifically devoted to the breadfruit, titled *Vom Brodbaum* (*On The Breadtree*, 1784), in which he attempted to level with some of the misconceptions and stereotypes that pervaded and muddied the European South Sea imagination. However, as I shall argue, his essay also conceals a more problematic side in its engagement of early racial theory and, ultimately, hierarchical Eurocentric thinking. My underlying contention is that, even though Forster's position may appear more benevolent when compared to that of his other, more imperially minded, European counterparts, it is still necessary to probe the underlying power structures, especially the naturalist's gaze which seeks to transform the world into knowledge through a particular kind of observation, classification and ordering (Cooper 2005).

2. 'BREAD OF THE GODS'. BREADFRUIT IN THE EIGHTEENTH-CENTURY SOUTH SEA DISCOURSE

Numerous signs and signifiers echo the deep connection between the Pacific cultures and a vital dietary staple. Indigenous designations, including *beta*, *bia* and *kapiak* in Vanuatu, the Solomon Islands and Papua New Guinea respectively, as well as *'ulu*, *'uru* and *buco* in Samoa, the Society Islands and Fiji, uniquely signify the breadfruit within each region (NTBG n.d.). Throughout the Pacific, diversity thrives both in language and in the narratives woven into each nomenclature, shaped by differing languages, histories, ecologies and cultural traditions. Yet,

in the records of European travellers and explorers, a singular term, 'breadfruit', predominates, reflecting at once the plant's exotic allure and the commonplace familiarity that facilitated its assimilation into the European cognitive landscape.

Known for its starchy and satiating properties, the breadfruit almost immediately became associated with the Garden of Eden in the literature of European 'discovery' and expansion. Its large, glossy leaves and abundant, nutritious fruit were compared to the bountiful vegetation, but also the 'forbidden fruit', described in the Garden of Eden, connecting it with humanity's origins, the allure of a lush, pristine garden, as well as humankind's ultimate 'expulsion' and the postlapsarian toil for 'daily bread'. Writing about the island of Guam as observed in the 1770s, French explorer Julien Crozet described the breadfruit as tasting 'exactly like bread' and having 'the same nutritive properties'. He concluded by saying:

> It is consequently very pleasant for the fortunate inhabitant of these islands, to be assured of his daily bread; to nourish himself he has only to cull it and eat it, and that too without any of the troubles attaching to ploughing the field, sowing the grain, hoeing, harvesting, threshing, winnowing, grinding, kneading or baking (Crozet 1891, 87).

The tendency to apprehend life in the Pacific in these quasi-Edenic terms was a dominant feature of the South Sea discourse. By the time of the Cook and Bougainville voyages of the 1760s and 1770s, the island of Tahiti (one of the islands in the archipelago known as the Society Islands) occupied a central place in the European consciousness, fuelling belief in the existence of a timeless Edenic paradise in the Pacific. As the food at the heart of that society, the breadfruit condensed many of the idealising tendencies, but also the disavowal and the fantasies of appropriation, exchange and transculturation that accompanied Tahiti's cult status. Botanist Joseph Banks, one of the main protagonists of this history, suggested that the fruit be called *Sitodium* or 'bread of the Gods' to reflect the luxuriant lifestyle that reigned on Tahiti as well as the ideal character of its inhabitants (Thunberg and Banks 1779: 474). He also wrote upon visiting Tahiti in 1768:

> [I]n this article of food these happy people may almost be said to be exempt from the curse of our forefathers. Scarcely can it be said that they earn their bread with the sweat of their brow when their chiefest substance Breadfruit is

FIGURE 2.

John Sebastian Miller (after Sydney Parkinson). 1769? *A branch of the bread fruit tree with fruit*. Engraving. 36.6 x 31.0 cm. © National Maritime Museum, Greenwich, London.

> procur'd with no more trouble than that of climbing a tree and pulling it down (Banks 1962: I, 341).

These comments largely echo those made later by his French colleague Crozet in that they both perpetuate the trope of breadfruit as 'bread without the effort' (Casid 2004: 23) and emphasise the Tahitians' good fortune in being in possession of such a foodstuff. But, by stressing the aspect of labour and expertise, they also belie a latent, much more modern gesture of denigration. European idealisation of Tahiti as a reification of paradise concealed a darker side: namely, the devalorisation of Polynesians as people supposedly without skill, civilisation and history. What Sylvia Hallam has written about Australia is equally true of the South Pacific cultures: unable to conceive of indigenous Australians as agents, the first colonisers confounded the managed anthropogenic environment they encountered for the land 'as God made it' (1975: vii). Tropical plants and products like the breadfruit would simply 'grow on their own' without any need for attendant care and cultivation.[3]

3. 'FOOD FOR SLAVES'. THE BREADFRUIT VOYAGES OF THE 1780S AND 1790S

The best-known chapter in the history of the breadfruit, intricately tied to this context of denigration and the assertion of European cultural superiority, is the voyages led by Captain Bligh in the late 1780s and early 1790s. The infamous mutiny aboard the *Bounty* instigated by rogue lieutenant Fletcher Christian, the subject of a 1962-film starring Marlon Brando and a 1984-remake starring Anthony Hopkins and Mel Gibson, has somewhat obscured the imperial mission underscoring the expeditions. Heralded not only for its easy procurement, but also for its

3 Common to Crozet and Banks is their invocation of climatic thinking and a trope of 'tropical bounty' that informed European perceptions of tropical island cultures at this time. According to David Arnold, since around the fifteenth century, identifying a part of the world as 'tropical' became synonymous with drawing an imaginary line dividing it from a northern temperate zone, the imagined centre of occidental civilisation (Arnold 2000: 7). As Clayton and Bowd point out, climatic thinking and the concurrent views of nature, culture and landscape are 'endowed with great moral significance' (2003: 2). In the case of eighteenth-century Tahiti, with its profusion of breadfruit, this reflects in Banks' suggestion that the Tahitians do not 'earn' their subsistence through the 'sweat of their brow' as Europeans do.

satiating qualities, and thus touted by Banks and even Captain Cook as the perfect 'food for mankind',[4] the breadfruit became, as Emma Spary points out, 'the ultimate desideratum of improving acclimatizers' (Spary 2000: 129–30). Though Bligh was memorialised as the hero of the whole affair, it was Banks who masterminded and coordinated the effort to transport breadfruit tree specimens from Tahiti to the British West Indies with the aim of feeding enslaved Africans labouring on British plantations more cheaply. If the mission were a success, it would be a testament to the ingenuity of European science, and to the moment in which Europeans and Tahitians united towards a common goal that, it was argued, would benefit all mankind (Newell: 2010). But, in order to fulfil its new role as a superfood, the breadfruit first had to be reinvented in discourse. John Ellis, an English naturalist friend of Banks, described the breadfruit as 'very satisfying, therefore proper for hard-working people ...' (Ellis 1775:13). This drastic semantic shift from 'bread of the Gods' to 'food for slaves' (Mackay 1985) demonstrated the ideological effort science was prepared to undertake in the service of nation and empire. Banks could not imagine 'an undertaking really replete with more benevolence … than that of transporting useful vegetables from one part of the earth to another where they do not exist' (qtd in Bewell 2007: 95). Incidentally, the breadfruit did flourish in its new home of the West Indies, but, by the nineteenth century, had become a food so hated by the enslaved of St Vincent and Jamaica that it was reserved exclusively for animal fodder (Mackay 1985: 123–43).

The breadfruit voyages of the 1780s and 1790s exemplify the argument Londa Schiebinger advances in her study *Plants and Empire* – that imperial botany was not only a highly politically and ideologically charged venture about 'national wealth, and hence power' (2004:

4 As Banks would write in an article for the *Philosophical Transactions* in 1779: 'Fructus autem praeprimis est, qui generi humano tantae utilitatis est, vel sterilis vel feminibus farctus' ('but above all it is the fruit that imparts full thighs in place of meagre ones, hence its utility to mankind') (Thunberg, Banks 1779: 474). Cook may have been the first to describe the breadfruit as the perfect food for mankind: '[I]f a man plants ten of them [breadfruit trees] in his life-time, which he may do in about an hour, he will as completely fulfil his duty to his own and future generations as the native of our less temperate climate can do by ploughing in the cold winter, and reaping in the summer's heat, as often as these seasons return' (Cook 1773: Vol. 2, 12). This citation, however, has been attributed by other authors to Banks or Hawkesworth.

FIGURE 3.
Thomas Gosse. 1796. *Transplanting of the Bread-Fruit Trees from Otaheite.* Mezzotint, coloured. 49.2 x 60.6 cm. Courtesy of the State Library of NSW.

5), but also one where 'agnotology' or 'culturally induced ignorance' was prevalent (Ibid.: 3). Settled in Polynesia since sometime between 300 and 800 CE, the Tahitians were without doubt skilled and intelligible masters of the environment in which they lived. Yet, in the interest of his own status as a European 'improver', Banks cast the Polynesians as fundamentally incapable of such ingenuity in order to legitimise the privilege of his own interests and epistemology over that of local indigenous knowledge systems.

4. MIGRATIONS, TRANSPLANTATIONS. PLANT-HUMAN ENTANGLEMENTS IN GEORG FORSTER'S ESSAY *ON THE BREADTREE* (1784)

Probably the most proactive person in this context of combatting misconceptions and stereotypes around the South Sea cultures, both negative and positive, was Georg Forster. Through his participation in Cook's second circumnavigation of 1772 to 1775 and the direct insight he gained into life in the Pacific, Forster advanced to the leading authority on the South Seas in the German-speaking world. At just 23 years of age, he penned what has been deemed by modern scholarship as 'the most readable of all accounts of Cook's voyages' (Smith 1985: 55), *A Voyage Round the World* (1777). Alexander von Humboldt, himself a pioneering travel writer and life scientist, would even credit Forster as being the founder of a new, distinctly German form of comparative ethnology (Humboldt 1847: 72).

As a professional naturalist or *Naturforscher*, Forster was also the first to author a lengthy essay specifically devoted to the breadfruit, entitled *Vom Brodbaum* (*On The Breadtree*, 1784),[5] to which I now turn my attention. Forster's essay is noteworthy, in my opinion, for two reasons. For one, the historicisation that the breadfruit undergoes through Forster, its inscription into a several-centuries-long history of migration, engenders a major shift in thinking about Pacific cultures at a time when the discourse is otherwise heavily saturated with the colonial language of disavowal, dependence and dominance. From the outset of the essay, the breadfruit is introduced as a plant whose destiny was always influenced to a considerable degree by movement and displacement: 'The breadtree belongs to a small number of plants which have spread over a large portion of the earth' (Forster 1784: 4); in the South Seas, where it is native, the breadfruit can be encountered 'at almost every coast and on every island' (Ibid.). And yet, already as a sign of an encroaching presence of the human, Forster hastens to add: 'That nature allowed it [the plant] to

5 Georg Forster (1784). No English version of the essay exists in the public domain. All translations from the German are my own. Any German-language terms have been cited using original eighteenth-century spelling (e.g. *Brodbaum*, *Perfectibilität*, *Cultur*, *etc.*), as they appear in Forster's text.

sprout in this entire region all by itself and without any human interference, is not at all what I am claiming' (Ibid.).

What Forster is attempting to do here is to make the history of the breadfruit understandable as a history of its mobilisation through people. Speculating on how this larger evolutionary event unfolded, the German is one of the first to advance a theory of Austronesian expansion – that is, the hypothesis that, over a period of many thousands of years, a people of south-east Asian provenance migrated eastwards, spreading their culture, language and customs throughout much of south-east Asia and the Indo-Pacific (Douglas 2008). As he reasons:

> We know of periods in which an uncontainable urge pushed the inhabitants of western Asia and those of Europe to leave their homes; periods where numerous hordes wandered half the world before they were able to find calm again. Why should we not venture to postulate a similar epoch of migration for the original Asian ancestors of our islanders …? (Forster 1784: 6)

Shedding the exotic aura previously assigned to it as 'bread of the Gods', the breadfruit tree is rationalised in the pragmatic role it played as 'hand luggage' within this history of migration and transplantation:

> [W]hat could be more natural than to take all their mobile belongings with them and to load their vessels with the most useful domestic animals, namely pigs, dogs and chickens, and with those plants from which the greatest utility could be expected, whose roots promised to fair the longest, and the cultivation of which would require the least effort? (Forster 1784: 6–7)

Forster's claim here, in other words, is that calculated human intervention and cultural techniques, rather than accidental influences, had substantively shaped the breadfruit's history – and indeed long before Banks' and Bligh's attempt at transplanting the breadfruit from Polynesia to the West Indies (Forster 1784: 2–3). This insight into an entangled human-plant evolutionary history represents a major departure from Crozet, Banks et al., and a first step towards the erosion of the myth of a ready-made Edenic South Sea paradise, where the Pacific islanders are denied any sense of historical agency and anthropogenic impact.

However, just as this claim had substantive potential to decentre the idea of European exceptionalism, it is also necessary to consider the possible distortion that may result from such a perspective. As Barbara Maria Stafford has argued, Forster's work 'serves as a guide' (1984: 349)

to expose the scientific gaze that undergirds European travel accounts – 'the ability to see in order to acquire knowledge' (Ibid.: 52–53). In Forster's case, conflating different ways of seeing and 'limiting the scope of the visible' (Foucault 1973: 147) allow him to posit what he can otherwise only conjecture – a history of improvement, refinement or 'perfectibility' (*Perfectibilität*) (Forster 1784: 17), where all roads seem to lead to Tahiti. Building on his hypothesis of an Asian provenance of the Pacific Islanders, Forster believes it reasonable to consider the 'spiky, seeded variety of the breadfruit' (Forster 1784: 16) found on 'the coast of Celebes [today Sulawesi], in Banda, Ambon and in the Maluku Islands in general' the original, 'wild' variety of the plant (Ibid.: 8). The lack of spikes and seeds in the variety observable 'in the eastern groups of the Society and Marquesas Islands' (Ibid.), on the other hand, Forster takes to be a sign of 'culture' (Ibid.: 17), whereby a calculated act of intervention, the 'mutilation of the fruit' (*Verstümmelung der Frucht*), is classed as an improvement:

> At last, in the Society Islands people learnt that a cropped branch of the fully-grown tree could be committed to the earth and raised with considerable success to produce progeny. Soon the sharp edges and knobby outgrowths started to disappear; the stem became smooth and shot up straight and daintily into the sky; the foliage, which was otherwise coarse to touch and covered with thick hair, assumed a more delicate, proper and smooth appearance (Forster 1784: 18).

But, just as Forster's argument summons the almost irreducible materialising quality of the breadfruit to mediate a history, so too does it appear to evoke the power of place, and ultimately landscape. Interchanging between the microscopic and the cartographic, the discerning anatomising eye of Linnaean botany and a more sweeping panoramic perspective anticipating Humboldt, Forster's text navigates a diverse range of terrains and topographies, all of which in turn fabricate a map – a geography that documents not a fact, so much as an envisaged order to be undertaken (Rachwal 1999). 'And yet I caution a glance at the chart of that region of the world, I oversee the great Pacific ocean …' (Forster 1784: 5) – through this 'I' Forster invokes the authority of imperial vision, an instance of what Pratt has theorised as 'the monarch of all I survey' (Pratt 1999). It is this same 'I', the knowing Western subject, that in effect renders a binary vision of the Pacific as a series of diversified landscapes fundamentally at odds with each other.

In the end, this all works towards mapping a divide between supposedly more dominant and deficient cultures, implicitly serving a structure of 'dependence and disavowal' on which Western anthropology is centrally predicated (Mignolo 2003: 441–42). 'Wild,' 'overgrown' landscapes, just like the 'spiky' and 'pithy' variety of breadfruit imply that the 'sluggish, indifferent' Indonesian (Forster 1784: 16–17) is invariably in need of tutelage, whereas the 'smooth,' 'hairless' and 'seedless' variety of breadfruit present in Tahiti and the island's overall more 'cultivated' and domesticated appearance attract Forster's greater admiration and sympathy as a symbol of its more advanced culture. Throughout his essay, Forster continually draws parallels between the cultural techniques employed by the Tahitians and those exercised by Europeans on the breadfruit's German and European equivalents. Just like the Tahitians succeeded in taming and domesticating the breadfruit, 'roughly in the same way the hard work and art of our ancestors prevailed, transforming crab apples into Borsdörfer apples, russet apples and calvilles, and wild cherries into sweet Spanish and juicy morello cherries' (Ibid.: 18), he writes. While these comparisons ostensibly serve to translate what must have been foreign into the experiential horizon of the European reader, what they really suggest is that Europeans and Tahitians share a common cause and commitment. In their obvious aptitude for agriculture, that is, toiling Europeans and improving Tahitians invariably passed through similar states, or stages of material development – and perhaps will continue to do so. Both inhabiting a hybridised landscape of man-made fruits – some, like the cherry, literally a spoil of empire[6] – the far-removed peoples of provincial Germany and Tahiti are, if but momentarily, made to 'mix'.

5. 'CHASTE BEAUTY'. RACIAL THEORY IN FORSTER'S ESSAY *ON THE BREADTREE*

But in Forster's case, the felt affinity, or 'common ancestry', between Germans and Tahitians may be more than just rooted in a shared history of gardening and agricultural labour. It may also be of a more erotic,

6 Pliny's *Natural History* documents that the cherry was imported to Italy by Lucius Lucullus in 74 BC in the wake of the victory against King Mithridates VI of Pontus and within 120 years had found its way as far as Britain.

and ultimately racial character, reflecting Forster's interest in engaging with the late-eighteenth century science, or pseudo-science rather, of 'race' centred around figures like Johann Friedrich Blumenbach, Samuel Thomas von Sömmerring and Immanuel Kant. It is well known that, in the mid-1780s, Forster and Kant became embroiled in a public tit for tat that played out in a series of publications, notably Kant's 1785 essay *Determination of the Concept of a Human Race* and Forster's rebuttal of 1786 *Something More on the Human Races* (Kleingeld 2013: 92–123). It is also well documented that eighteenth-century theories of race often invoked stereotypes of the sexual behaviour of different racial groups (e.g. Africans as hypersexual) in order to support ideas of racial hierarchy (e.g. sexually restrained white Europeans as racially superior) and even early eugenic theories. However, as Robert Young has argued, what these early European racial theories and constructions of others ultimately belie is an obsession with racial hybridisation. According to Young (1995), the colonial discourse's fascination with racial intermixture and miscegenation displays, even at its most hierarchical and denunciatory, an underlying subconscious fascination for the other, or what Young calls 'colonial desire' (8).

As is generally known, the model function that Tahitian society came to assume for British, French and German audiences in the wake of the Cook voyages derived substantially from its supposed resemblance to the great patriarchal societies of ancient Greece and Rome (Despoix 2005: 131–57). Yet, arguably the main reason why Tahiti became such a source of fascination for European audiences was because it condensed the whole scene of sensuality and interracial sexual encounter. Heralded by Bougainville as *La nouvelle Cythère* (Bougainville 1771: 209), 'the New Cythera' after the claimed birthplace of Aphrodite, Tahiti attracted the reputation as a pleasure playground where European male sexual fantasies were free to play out. As a young man on board of Captain Cook's ship, Georg Forster had intimate first-hand knowledge of the realities of interracial sexual union and concubinage 'in the contact zone'. In his philosophical travel account *A Voyage Round the World*, Forster even discusses these topics at length and, unsurprisingly, it is Tahiti, the uncontested island of *eros,* that draws most of his attention. But, like the cartographically minded Cook, who adamantly condemns

the fraternisation of his sailors with the Tahitian women[7], Forster – the son of a German Protestant pastor – often takes the moral highroad, invoking his commitment to science as a precept for (his own) erotic and sexual abstinence (May 2008, Küchler-Williams 2004).[8]

Robert Young has nevertheless observed a strategy by which the European discursive *othering* of foreign landscapes often reverts to representations of sexualised and feminised corporeality to naturalise hierarchies of dominance and dependence and to frame colonial expansion as the adventurous appropriation of 'virginal' territories (Young 1995). In Forster's case, the strategy is slightly different: feminisation of the landscape as a means of pivoting from one model of paternalism based on colonial domination and conquest to another one more aligned with the humanitarian goals of the scientific Enlightenment. This juxtaposition is apparent, for instance, in Forster's reference to the breadfruit as a 'chaste beauty' (*sittsame Schöne*) (Forster 1784: 2), whereby the fruit's 'chastity' supposedly derives from it having remained 'unknown to European commerce for so long' (Ibid.). Furthermore, by invoking botanists like 'the honest Rumph' (Georg Eberhard Rumph, author of the *Herbarium Amboinense*, 1741–1755) (Forster 1784: 25) or the tradition of 'naturalists' (*Naturforscher*) (Forster 1784: 23), Forster's essay attempts to place science in a figurative bond of paternity with the Pacific cultures: scientists like himself are cast as the natural protectors of colonised, or not-yet colonised peoples against the commercial interests of the 'European thief' (Forster 1784: 27) of imperial trading and plant trafficking.

Acknowledging Forster's trenchant commitment to science over commerce and his sustained attempts to manage the taboo realities of European 'commerce' in Tahiti, his apparent nostalgia for a paradise lost does nevertheless complicate the essay's otherwise protracted message

7 'We had not been here many days before some of our people got this [venereal] disease … I … did all in my power to prevent its progress, but all I could do was to little purpose for I may safely say that I was not assisted by any one person in ye Ship' (Cook 1968: 99). For a discussion see Bridget Orr (1994: 225–31).

8 Forster's commitment to science over commerce seems to validate the argument Nicholas Thomas makes in his book *Entangled Objects*, namely that 'the natural scientists and philosophers [who commented and theorised the Pacific] ... asserted the privilege of their own interests in specimens and regarded the acquisitive and commercially motivated behaviour of common sailors as illegitimate' (Thomas 1991: 140).

of austere, professional objectivity. One may even argue that, in the anthropomorphising language of the Tahitian variant of the breadfruit as both 'chaste' and 'beautiful', what is ultimately being articulated is desire for the Tahitian body itself. Being a 'meal' (*Speise*) as much as a plant, in the conclusion of his essay Forster considers the influence of nutrition on the body's constitution and, in turn, the superlative visual beauty of the Tahitian men, supposedly unequalled by any of their neighbours in the Pacific:

> Indeed, their generation (*Geschlecht*) can claim a marked advantage over their neighbours. Of large and noble stature with open countenance and disarming traits it verges on the model of real Asian beauty and even threatens to take precedence (Forster 1784: 27).

What Forster is arguably invoking here are not the effects of consumption, as he claims, so much as an inferred history of racial 'refinement', engendered by many years of meticulous cultivation and improvement. Through a turn to the anatomising optics of Classical aesthetics and physiognomy, Tahitians are conceived in analogous terms to the seedless, spikeless, smooth and thus 'beautiful' breadfruit variety, engendered by an intervention of 'culture'. A passage of the *Voyage Around the World* only underscores this glorification of the Tahitian male form:

> This climate, and its salubrious productions, contribute to the strength and the elegance of their [the Tahitian males'] form. They are all well-proportioned, and some would have been selected by *Phidias* or *Praxiteles*, as models of masculine beauty. Their features are sweet, and unruffled by violent passions. Their large eyes, their arched eyebrows, and high forehead, give a noble air to their heads, which are adorned by strong beards, and a comely growth of hair. These, as well as their beautiful teeth, are the proofs of vigour, and of a sound habit of body (Forster 1958: 598).

Of Tahitian women, by contrast, Forster holds:

> The other sex is not any less well-formed. Certainly, it is not possible to say they are beautiful, though they still know how to win men's hearts, and their unaffected smiles, and a wish to please, insure them mutual esteem and love from our sex (Ibid.).

In Chunjie Zhang's reading of this passage, the function of Forster's detailed description of the Tahitian male body is to invite identification on behalf of European '(male) readers' who may imagine themselves 'transformed into these beautiful and healthy Tahitian male bodies ...

accompanied by an agreeable and devoted female sex' (Zhang 2013: 271). Nevertheless, just as Forster's praise suggests emulation for the purposes of the heterosexual copulation, it is important to recognise the passage's latent homoerotic undercurrent and the objectification that the Tahitian male himself undergoes. Arguably, Forster's gaze betrays an underlying gesture of domination, rendering of the Tahitian male a modest, feminised object of aesthetic and intellectual appreciation: much like the breadfruit a 'chaste beauty', to be seen yet not to be touched.

Most accounts of race 'in the West' would direct us to the Atlantic economy, explaining race as the ideology that facilitated slavery and, therefore, enabled capitalism. Forster's conceptualisation of a hierarchical Pacific garnered through a conjectured plant-human co-evolution serve to decentre and complicate this historiography. In a period when German intellectuals were contemplating the mysteries of the botanical *Urpflanze* (Goethe) and the human *Stammrasse* (Blumenbach, Kant) at the same time as they were heaping encomium on the 'ideal forms' of Hellenistic sculpture, art and literature in the context of Weimar Classicism (Winckelmann, Goethe, Schiller) (Bindman 2002), Forster's essay *Vom Brodbaum* unconsciously speaks the language of racial superiority, ascribing to the Tahitian 'of large and noble stature' a model function for the German people of northern Europe. The correlation between this idealisation of Tahitian plasticity and the attempt to valorise the 'chaste' German eye, capable of recognising, appreciating and theorising such beauty, is not accidental and perhaps evidence for Philippe Despoix's claim that German intellectuals attempt to steer against the predominance of the established imperial powers through the medium of science, the arts and learning (Despoix 2009: 183).

6. CONCLUSION

This article has examined the intricate and discordant relationships between humans and plants, focusing on the breadfruit tree within the context of European colonial botany. Drawing inspiration from feminist and indigenous scholars, the analysis uncovered the appropriation and marginalisation inherent in colonial enterprises, where indigenous botanical knowledge was exploited while native populations were

dehumanised. The breadfruit, emblematic of these practices, highlights the broader themes of power, knowledge, and commodification that defined its transcontinental journey.

Georg Forster's work on the breadfruit, both as a scientific curiosity and a symbol of cultural encounters, serves as a lens to explore these dynamics. His essay *Vom Brodbaum* attempts to reconcile European misconceptions and stereotypes about the South Pacific but ultimately reveals the limitations and biases of the colonial gaze. While Forster's recognition of the breadfruit's role in Austronesian migration challenges the myth of an untouched Edenic paradise, his approach still reflects Eurocentric hierarchical thinking. The broader historical context, including the breadfruit voyages of the late eighteenth century led by Captain Bligh, underscores how imperial botany served national wealth and power while fostering culturally induced ignorance. The breadfruit's transformation from 'bread of the gods' to 'food for slaves' epitomises the ideological shifts and exploitative practices of the period.

By dissecting the intersections of botany, colonialism and racial theory, this article calls for a re-evaluation of human-plant relationships. It suggests that moving beyond the legacy of dissonance and towards a language of resonance can provide valuable insights for contemporary discussions on interspecies and intercultural connections. The breadfruit's story, thus, offers a critical perspective on the politics of colonial botany and the potential for fostering a more equitable and respectful engagement with the natural world in the twenty-first century.

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Resonance and Vegetal Citizenship in Aldo Leopold's *A Sand County Almanac*

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ABSTRACT

The problem of ethical obligations to plants has rarely been raised in Western traditions of thought. However, it is central to Aldo Leopold's *A Sand County Almanac,* one of the key texts of modern American environmentalism. For Leopold, the effects of a civilisation on the vegetal base of the trophic pyramid are the ultimate measure of its value, and the principal failure of modern civilisation is that it blinds people to this fact. For humans to become proper citizens of the land community, they must build reciprocal relationships with other members of the community, which can be understood as relationships of resonance (H. Rosa). Crucially, this also includes plants, who are thus recognised as vegetal citizens. Leopold's descriptions of his own relationships to the native flora, built over the course of a decade of ecological restoration work on his property in Sauk County, Wisconsin, must be viewed in this context.

KEYWORDS

anthropomorphism, biotic community, environmental ethics, land ethic, resonance

hat do we owe to plants? Taken in a material sense, this question is easily answered: photosynthesis by plants provides the energetic foundation for almost all of life on Earth. In the most basic and literal sense, and even before considering the specific uses of the countless materials derived from plants, we owe them our very existence as biological organisms. What kinds of *ethical* obligations this existential debt might impose on human beings, however, is a different question – one that very few Western thinkers considered to be worth asking. Around the turn of the last century, this began to change. Scholars across the humanities started to write against the 'plant blindness' endemic to modernity (Wandersee and Schussler 2001), and they tried to articulate new or rehabilitate old ways of valuing vegetal life. In the emergent field of plant ethics, they have shown how established approaches in environmental ethics fail to take proper account of plants. 'Extensionist' arguments seek to ground plants' ethical value in their possession of attributes we also value in humans or animals (such as sentience or agency; Pellegrino 2018, 15),

and to expand concepts such dignity or rights so as to include them (as Peter Singer famously did for some nonhuman animals). 'Biocentric' positions, by contrast, rest their case on the shared property of aliveness, arguing that all living things deserve moral respect merely by virtue of being alive. As Angela Kallhoff has pointed out, both types of argument can be criticised for failing to grasp plants in their specificity, unduly anthropomorphising them, in the first instance, and in the second begging the question how the claims of one life form ought to be weighed against those of others. Kallhoff proposes a third strategy, arguing that plants have their own capacity for flourishing which humans can recognise without projecting feelings onto them or otherwise eliding the fundamental otherness of vegetal life (Kallhoff 2014). Because plants have the capacity to flourish, humans can care for them, and genuine relationships of care are valuable in and of themselves, in ways that cannot be reduced to the particular benefits accruing from such a relationship to either party (Schörgenhumer 2018).

In this essay, I will not try to retrace any of these arguments in detail. Instead, I want to turn to a writer who thought deeply about these issues long before the current upsurge of interest in matters vegetal. Aldo Leopold's famous essay 'The Land Ethic' is widely credited as the first serious attempt to articulate an environmental ethics. Leopold himself is claimed as an intellectual forebear by conservationists all over the world (you will, for example, encounter quotations from him on the signage in Taiwan's national parks). 'The Land Ethic' is still widely taught and discussed in philosophy and environmental studies departments, and catchphrases from *A Sand Country Almanac* (1949; in the following cited as SCA), where the essay was originally published, are regularly invoked by ecocritical scholars. Yet, however often we are admonished to 'think like a mountain' (SCA: 137), *A Sand Country Almanac* itself has become a classic in the sense of Mark Twain: 'something that everybody wants to have read and nobody wants to read' (Twain 1910: 194).

One reason for re-reading Leopold's *Almanac* today is that it offers valuable insights about the human relationship to vegetal life, and about the question of how this relationship might be conceived in terms which are not purely instrumental. Leopold's views are not readily translatable into the vocabulary of contemporary plant ethics. Reading the *Almanac* is to see the writer pursue several different, sometimes incompatible, arguments and explore a range of discursive registers in the effort to find

a language which could adequately express what it means to care for the land. In 'The Land Ethic', Leopold formulates his famous imperative that humans should learn to see themselves and other creatures as 'citizens' of the land community. However, this abstract notion of biotic citizenship only comes to life in the more overtly autobiographical sections of the book which dramatise the experience of becoming a biotic citizen – a process which involves, crucially, coming to care for plants as fellow citizens. Leopold's views as they emerge from these sections run in many ways parallel to a relational ethics of care for plants such as has been proposed by Kallhoff and others. The conceptual framework I will employ in the following is the more capacious one of *relationships of resonance*, as developed by Hartmut Rosa. Relationships of care require an attentiveness by the carer to the needs of the cared-for, and the former also must take action for the welfare of the latter. They do involve 'uncontrollable relational experiences of Otherness' which are the defining feature of relationships of resonance (Peters and Majid 2022: 142), but are better understood as constituting a more narrowly defined subset of the latter. Both are relationships constitutive of the self, making someone the person they are, whose value can therefore not be easily generalised.

In the following, I will begin by introducing the concept of the land community which forms the foundation of Leopold's ethical thought, as well as the notion of biotic citizenship he derives from it. After discussing some of the attempts that have been made to clarify the meaning of these concepts by grounding them either in a republican ethics of civic duty or in a biocentric ethics of ecological interdependence, I then go on to analyse passages from the *Almanac* which describe the process of becoming a citizen of the land community as an entry into a relationship of resonance – especially of resonance with plants. The latter's status as 'vegetal citizens', I conclude, is an outcome of the same relational process by which Leopold himself is constituted as a citizen of the land community.

II.

The key concept on which Leopold's land ethics hinges is what he variously calls 'the biotic community' or 'land community'. It is this entity at which his new categorical imperative is first of all directed: 'A thing is right when it tends to preserve the integrity, stability, and beauty of

the biotic community. It is wrong when it tends otherwise.' (SCA: 262) While this concept is central to Leopold's thinking, it is also deeply ambiguous. On the one hand, Leopold uses the terms 'biotic community' or 'land community' as straightforward synonyms for what ecologists also refer to as the food web or the trophic pyramid. The basic outlines of this will be familiar to anyone who paid attention in their high school biology class: plants absorb energy from the sun, herbivores eat plants, carnivores eat herbivores, and detritivores eat everything that has died, turning it into soil which then feeds the plants, and so on. To describe this structure as a 'pyramid' (as Leopold also does on many occasions) implies no normative hierarchy – it simply points to the fact that the number of organisms tends to decrease as one ascends from one level of the pyramid to the next (man, Leopold points out, occupies an intermediate layer' next to the 'bears, racoons, and squirrels which eat both meat and vegetables' – SCA: 252). When Leopold speaks of land, he is referring to this entire complex structure: 'Land … is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals.' (SCA: 253) Over the course of evolution, Leopold argues, this structure has steadily grown in complexity. The actions of modern humans, by contrast, have tended to have the opposite effect: they have simplified the food web, leading to the extinction of species, the accelerated loss of topsoil and the proliferation of pests and diseases. He lays particular emphasis on the negative effects the extirpation of top-level predators such as wolves have had on biodiversity, anticipating more recent ecological research on trophic cascades (Ripple and Beschta: 2005). Ultimately, Leopold argues, such human interventions have vitiated the ability of the whole system to regenerate itself. Humans act in this manner because they have failed to recognise that they are part and parcel of the land community and that, by diminishing it, they are at the same time diminishing themselves. It is this failure of recognition that Leopold's land ethic is meant to remedy: '[A] land ethic changes the role of *Homo sapiens* from conqueror of the land community to plain member and citizen of it. It implies respect for his fellow-members, and also respect for the community as such.' (SCA: 240)

In this latter formulation, however, the meaning of 'community' has subtly shifted. It is no longer just a matter of purely biophysical relations, of energy coursing through a biological circuit; instead, the community is now characterised as something one can be a 'citizen' of, something

which seems to entail rights and obligations. But citizenship and the attendant rights and obligations cannot be 'facts' in quite the same way that energy flows are – in our usual understanding, their reality is a function of the 'respect' accorded to them, as Leopold's formulation also suggests; their existence depends on their being recognised. My passport is a physical object, but the rights it conveys to me are not, just as the value of a banknote has nothing to do with the paper on which it is printed. In this sense, citizenship and community are relationships whose reality depends crucially on recognition, on routinised expectations of reciprocity that are condensed into shared symbols (such as passports or banknotes). And crucially, citizenship is conditional: it can be disavowed or revoked. By contrast, the position of an organism in the trophic pyramid is non-negotiable, even though certain species may enjoy some degree of variability (humans, for example, may choose to be vegetarians). Every organism must eat and will be eaten, in accordance with its biophysical properties; and, much as some of us might dream of becoming autotrophic, the gift of photosynthesis remains, for the time being, a unique privilege of plants.

One might conclude from this that Leopold's land ethic, insofar as it involves a description of the trophic pyramid as a 'community' with human and nonhuman 'citizens', is based on a metaphor – a metaphor which sets us up to succumb not only to the naturalistic fallacy (i.e., turning an is into an ought – in this instance: turning the fact of trophic relations into a normative fantasy about how biological species ought to relate to each other) and anthropomorphism (by projecting characteristically human qualities onto nonhuman beings), but which furthermore entangles us in a paradox: as the appeal of the land ethic seems to be directed only at humans, they are clearly assumed to occupy an exceptional position within a community of which they ostensibly are only 'plain members' (SCA: 240). The form of the statement (which singles out humans) thus contradicts what it purports to say (that humans are on a level with other members of the community).

Philosophical interpretations of the *Almanac* have generally sought to resolve this paradox by focusing only on one side of the community metaphor (which conflates political or social relations and ecological relations) while downplaying or ignoring the other. Thus, Peter Cannavò has argued that Leopold's notion of biotic citizenship must be understood in the context of an American tradition of republican thought,

exemplified most famously by Thomas Jefferson, which emphasised conceptions of the common good and civic virtue. In this view, prudent land management which ensures the long-term health of the polity's ecological base is what the citizens of a republican polity owe to each other, because the health of the land is a direct condition for the health of the polity (Cannavò 2012: 867–68). Accordingly, Leopold's 'biotic community' would be 'merely' a metaphor which serves to illustrate the biophysical conditions for the flourishing of what remains in the end an exclusively human community. Conversely, Baird Calicott's influential ecocentric interpretation seeks to ground the Land Ethic in a Darwinian account of moral sentiments as an evolved response arising from real interdependencies. Moral sentiments enable cooperative behaviour which is beneficial to the survival of the group. Just as we gradually came to recognise ethical obligations towards society as a whole, rather than just towards individual human beings, it makes sense to postulate ethical obligations towards ecological systems once we have come to recognise that they, just like human communities, form integrated wholes in which the welfare of the parts depends on the welfare of the entire community. The biotic community is thus an ecological reality which, as such, demands recognition and engenders a sense of ethical obligation in humans that is not substantially different from that obtaining within human communities.

Both of these interpretations capture important aspects of what *A Sand County Almanac* does; yet each comes with its own set of problems. In Cannavò's account, biotic citizenship is a purely human affair, and ethical obligations to nonhumans are merely a derivative function of ethical obligations between humans. The question with which I opened this paper – 'what do we owe to plants?' – does not even arise. But in Callicott, as well, the question of humans' ethical obligations to the vegetal citizens of the biotic community is sidelined by their obligations to the community as a whole, as he readily acknowledges: 'ethical consideration of its individual members is preempted by concern for the preservation of the integrity, stability, and beauty of the biotic community' (Callicott 1989: 196). Whatever we owe to plants, neither interpretation leaves much room for imagining the relationship between humans and plants in the manner Leopold's phrasing asks us to: as one between fellow citizens of a community to which both belong.

III.

I do not wish to contest the philosophical soundness of these two interpretations of *A Sand County Almanac*, nor do I want to suggest that they are seriously at odds with the text: as suggested above, one of the qualities that lends the book its enduring fascination is its philosophical eclecticism. Leopold does not push a single line of argument, but presents his readers with a whole bundle of reasons why people should care about the land, offered in a style that is by turns discursive and lyrical, satirical and meditative. However, neither of the two interpretations is especially helpful in understanding how Leopold writes about his experiences with nonhuman beings, and particularly with plants. Leopold's ethical intuitions grew out of his conservation work, and they cannot be easily separated from the relationships with other animals and plants that he formed over the course of a lifetime's worth of practical engagement with them. He understood these relationships to be reciprocal. They are not relationships between an inquiring (human) subject and a passive object, but are better understood as 'relationships of resonance' in Rosa's sense: they not only define the subject and the world in relation to each other, but both are 'shaped, and in fact constituted in and through their mutual relatedness' (Rosa 2019: 36; this and all following translations by the author). Rosa's concept is also germane because it is couched in a larger critique of modern life whose ever-accelerating pace, he argues, is systematically undermining the possibilities for experiencing resonance. Resonance is thus the conceptual counterpoint and antidote to the modern experience of alienation. Since the Romantics, Rosa points out, 'nature' has been one of the privileged domains where such experiences are sought out – albeit often in a vitiated form, cut off from everyday experience. This scepticism towards modernity is shared by Leopold, who, in the Foreword to the *Almanac* excoriates 'our bigger-and-better society' which has become 'so obsessed with its own economic health as to have lost the capacity to remain healthy' (SCA: ix). Much like Rosa, too, Leopold sees the scientific attitude, which consists in refusing resonance and treating the world as a passive object, as an important part of the problem.

Significantly, while Leopold is insistent that 'becoming a plain member and citizen of the land community' (SCA: 240) is partly a matter of ecological knowledge, he never suggests that it is merely a matter

of acknowledging the reality of the trophic pyramid: 'The evolution of a land ethic is an intellectual as well as emotional process' (SCA: 263). Many of the essays and narrative sketches in the *Almanac* are best understood as dramatising this process. They position Leopold himself as someone who, over the course of a lifetime of study and practical engagement, has gradually evolved towards the views expounded in 'The Land Ethic'. The chapter 'Song of the Gavilan', based on Leopold's experience during his several hunting trips to Mexico's Sierra Madre in the late 1930s, provides an especially poignant example. Leopold sets up the chapter by describing the sounds of the river Gavilan. 'This song of the waters', he goes on,

> is audible to every ear, but there is other music in these hills, by no means audible to all. To hear even a few notes of it you must first live here for a long time, and you must know the speech of hills and rivers. Then on a still night, when the campfire is low and the Pleiades have climbed over rimrocks, sit quietly and listen for a wolf to howl, and think hard of everything you have seen and tried to understand. Then you may hear it – a vast pulsating harmony – its score inscribed on a thousand hills, its notes the lives and deaths of plants and animals, its rhythms spanning the seconds and the centuries. (SCA: 158)

The 'vast pulsating harmony' is something that is neither available to the unaided senses nor understandable in purely intellectual terms, even though both sensory engagement and intellection appear to be required in order for it to become 'audible.' This sound, which is not really a sound, is that of energy coursing through the trophic pyramid ('the lives and deaths of plants and animals'). It is, one might say, the way in which the reality of the land community reveals itself to the human observer – although 'observer' is hardly the appropriate term here, as Leopold so insistently figures the relationship between the human 'you' and their biophysical surroundings in acoustic terms.

Leopold's insistence on the acoustic metaphor is more than a rhetorical flourish; its aptness becomes apparent when one considers the phenomenology of hearing. Sounds, Peter Sloterdijk points out, 'have no tangible substrate that could be encountered in the attitude of standing opposite something. From the physiology of listening as a state of being set in sympathetic vibration, it is evident that acoustic experiences are media processes which cannot possibly be represented in the languages of object relationships' (Sloterdijk 2011, 296). In the act of listening, the boundary between self and world is crossed effortlessly.

Hearing the world (as something by which one is affected and can attune oneself to) is not just a deficient version of seeing it (as a set of objects clearly separated from the self) – as Sloterdijk argues in a reflection on the sonic environment of the fetus, it is the primordial mode in which the world is encountered. The fetus, wholly enveloped by the soundscape of the mother's body, can thus serve Rosa as paradigm for his central claim that resonance is a process which does not so much put an already existing self into a relationship with a pre-given world, but rather produces self and world at the same time, as a co-occurring 'bi-polar unit' (Rosa 2019: 86) or, again in Sloterdijk's words, a 'biunity' of 'mutual referentiality and intertwined freedom from which neither of the primal partners can be removed without canceling the total relationship' (Sloterdijk 2011: 43). To be a citizen of the land community is to find oneself precisely in such a relationship – a relationship of resonance which cannot be objectified without destroying it. In the concluding passages of 'Song of the Gavilan', Leopold thus turns his acerbic wit against his academic colleagues:

> There are men charged with the duty of examining the construction of the plants, animals, and soils which are the instruments of the great orchestra. These men are called professors. Each selects one instrument and spends his life taking it apart and describing its strings and sounding boards. This process of dismemberment is called research. The place for dismemberment is the university … [All] are restrained by an ironbound taboo which decrees that the construction of instruments is the domain of science, while the detection of harmony is the domain of poets. (SCA: 162)

To appreciate Leopold's polemical tone, it is worth recalling that he was writing at a time when ecologists were above all concerned with shedding their image as butterfly-collecting amateur naturalists. They were striving to step out of the long shadow of natural theology and formulate their insights in a mathematical language which could satisfy strict criteria for scientific objectivity (Bergthaller 2007: 95–97). Leopold is swimming against this historical current when he insists that to describe the trophic pyramid merely as a set of discrete empirical facts is to become deaf to its song. In order for it to be experienced as a community, and its members as fellow citizens, it is necessary that the self be transformed; in the terms of the above passage, it must become a 'poet' attuned to the 'harmony' of the land.

Ecological attunement is a process; as such, it unfolds over time. Leopold's statement that hearing the song of the Gavilan requires one to 'first live here for a long time' may seem somewhat ironic, given that his own sojourns in the Sierra Madre never lasted much more than a month (Fleming and Forbes 2006: 25). Nonetheless, his claim is well-earned, and the underlying idea is essential to *A Sand County Almanac*, informing its very structure and providing the narrative underpinning for the many anecdotes of which it is composed. While 'The Land Ethic' is undoubtedly the most famous essay in the book, there is a good reason why Leopold placed the essay in its concluding section ('The Upshot'), because the concepts he advances there only really begin to make sense against the backdrop of the process of ecological education that is detailed in the preceding sections, especially the first section which gives the book its name. In this section, 22 sub-chapters of varying length are grouped according to the months of the year, from January to December. In these vignette-like stories, Leopold tells of the experiences he gathered over the course of more than a decade of ecological restoration work on his 'shack', the plot of abandoned farmland in Sauk Country he purchased in the Winter of 1935. This was a region which in the preceding April had been struck especially hard by the series of droughts and dust storms that became known as the 'Dust Bowl'. Leopold's goal was to see whether he and his family would be able to nurse the ailing land back to health. Because Leopold recognised that plants formed the base of the trophic pyramid, restoring the vegetation that had covered the area prior to the arrival of Euro-American settlers in the 1840s was central to these efforts. Beginning in the Spring of 1936, the Leopolds began to plant thousands of native pine trees and shrubs on their plot (Meine 1988: 364–65).

IV.

It is therefore not at all surprising that so many of the chapters of *A Sand County Almanac* are focused on Leopold's encounters with plants, and that this is especially the case in the opening 'Almanac' section of the book. His descriptions of these encounters are often whimsically anthropomorphic, but, as we shall see, never gratuitously so. They are always indicative of a heightened attentiveness to the peculiar qualities

of a given form of life, and to the way humans are affected by it. Every week between April and September, Leopold writes in the subchapter 'Prairie Birthday', 'there are, on average, ten wild plants coming into first bloom' (SCA: 47). This vegetal exuberance necessarily overtaxes the human ability to pay attention, yet it leaves no one untouched. How individual persons react to it reveals something about who they are: 'Tell me of what plant-birthday a man takes notice, and I shall tell you a good deal about his vocation, his hobbies, his hay fever, and the general level of his ecological education' (SCA: 48). But Leopold makes it very clear that this is no mere parlour game: the inattention to plants is an important reason for their destruction. 'Prairie Birthday' is above all a lament for the decline of Wisconsin's native flora. Its primary subject, however, is Silphium, a species of flowering plant that used to cover the Midwestern prairies but has now been reduced to marginal plots of land such as railroad embankments and, as Leopold pointedly notes, graveyards. The aim of the chapter, one might say, is to make Silphium 'grievable' (Barnett 2022: xx), but also to hold it up as an example and a warning: the story of Silphium, he writes, 'is one little episode in the funeral of the native flora, which in turn is one episode in the funeral of the floras of the world' (Leopold 1966: 50). Leopold cares for the fate of the Silphium because it has become a 'personality' to him, as he writes in a key passage:

> Silphium first became a personality to me when I tried to dig one up to move to my farm. It was like digging an oak sapling. After half an hour of hot grimy labor the root was still enlarging, like a great vertical sweet-potato. As far as I know, that Silphium root went clear through the bedrock. I got no Silphium, but I learned by what elaborate stratagems it contrives to weather the prairie drouths. (SCA: 52)

In the encounter with Silphium which Leopold describes here, he does not so much learn *about* the plant as *from* the plant. The encounter does not merely change how he *views* the plant: as his efforts to recruit it for his ecological restoration project are defeated by its 'elaborate stratagems', Silphium also changes *him*. The episode thus dramatises Leopold's transformation into an ecological citizen. It also highlights that this transformation is inseparable from his recognition of Silphium as a fellow member of a community to which both of them belong. This involves his being humbled by Silphium – quite literally *humiliated*, as he is brought to the level of soil in the futile effort to dig up its root

– which teaches him to 'respect' the plant, in the terms of 'The Land Ethic'.

Importantly, whereas the passage from 'Song of the Gavilan' may have seemed to suggest that entering a relationship of resonance with the land community requires an attitude of passive contemplation, the Silphium episode makes it very clear that, to the contrary, it may first of all be a matter of physical labour on the land, and that recognising plants as fellow citizens also involves an appreciation of the labour they perform for the community. In a brief subchapter titled 'Draba,' Leopold does precisely that. Draba is one of the earliest wildflowers to bloom in the Sand Counties, and it is a wholly inconspicuous plant:

> Draba plucks no heartstrings. Its perfume, if there is any, is lost in the gusty winds. Its color is plain white. Its leaves wear a sensible woolen coat. Nothing eats it; it is too small. No poets sing of it. Some botanist once gave it a Latin name, and then forgot it. Altogether it is of no importance – just a small creature that does a small job quickly and well (SCA: 28).

The performative contradictions account for much of the peculiar pathos of the passage: no poet sings of Draba – except for Leopold, and he is also plucking the reader's heartstrings by emphasizing how it perseveres in spite of others' disregard. Even the lowliest members of the community have a 'job' to do, Leopold suggests, and hence a dignity that demands our respect. Those who humble themselves before the quiet efficiency of Draba are amply compensated: 'He who hopes for spring with upturned eyes never sees so small a thing as Draba. He who despairs of spring with downcast eye steps on it, unknowingly. He who searches for spring with his knees in the mud finds it, in abundance' (SCA: 28). The respect Leopold pays to Draba is that of one labourer to another.

However, the plants that receive by far the most attention are pine trees. Given what we know about Leopold's restoration work at the shack, this should be wholly unsurprising: much of his time there was spent planting pines. In the 'Almanac' section, there are two longer subchapters in which pines figure centrally. The first of these is titled 'Axe-in-Hand', and it is a part of the 'November' chapter. As the title suggests, it is a meditation on the cutting of trees, which, Leopold tells his reader, is best performed during this month. Since our ancestors invented the shovel to plant some trees and the axe to cut others, he writes, the owner of land 'has assumed, whether he knows it or not, the

divine functions of creating and destroying plants' (SCA: 72). This is a matter of utmost importance, as he explains in a passage that echoes his critique of academic specialisation in 'Song of the Gavilan':

> Other ancestors, less remote have since invented other tools, but each of these, upon close scrutiny, proves to be either an elaboration of, or an accessory to, the original pair of basic implements. We classify ourselves into vocations, each of which either wields some particular tool, or sells it, or repairs it … by such division of labor we avoid responsibility for the misuse of our tools save our own. But there is one vocation – philosophy – which knows that all men, by what they think about and wish for, in effect wield all tools. It knows that men thus determine, by their manner of thinking and wishing, whether it is worthwhile to yield any. (SCA: 72)

It is important to appreciate the radicalism of the idea Leopold is proposing here: all technology must be judged by how it affects the vegetal base of the trophic pyramid, and hence the land community as a whole. The relations a civilisation entertains with plants is the ultimate measure of its value. The fundamental failure of modern civilisation is that it has blinded people to this fact, which is why so much of technological progress is self-defeating.

It is against this background that Leopold's following reflections on his own arboreal preferences must be read. He tries out several explanations for the bias that leads him to favour pines over the birches with which they compete: it might be 'paternal' affection, because he has planted the pines himself. It might be because birches are numerous whereas pines are scarce, hence a bias in favour of the 'underdog'; also, pines are more long-lived, so that the mark his work leaves on the land will last longer; unlike birches, pines are evergreen, and their wood fetches a better price on the market (SCA: 73–74). None of these explanations satisfies him. The most compelling reasons he is able to muster have to do with the role which the pine plays in the biotic community:

> Under this pine will ultimately grow a trailing arbutus, an Indian pipe, a pyrola, a twin flower, whereas under the birch a bottle gentian is about the best to be hoped for. In this pine a pileated woodpecker will ultimately chisel out a nest; in the birch, a hairy will have to suffice. In this pine the wind will sing for me in April, at which time the birch is only rattling naked twigs. (SCA: 74)

Tellingly, the last sentence in this list does not state a biological fact, but rather an aesthetic preference: there is no ecologically sound reason to prefer the rushing of wind through pine needles to the clattering

of leafless branches. The associations pines form with other species of flora and fauna are a matter of scientific record, but Leopold does not pretend that this could lend a firm scientific basis to his preference for pines: 'The only conclusion I have ever reached is that I love all trees, but I am in love with pines' (SCA: 74). Being in love with a tree is not a casual affair – it is a close relationship shaped through physical interactions over an extended period of time:

> The wielder of an axe has as many biases as there are species of trees on his farm. In the course of the years he imputes to each species, from his responses to their beauty and utility, and their responses to his labors for or against them, a series of attributes that constitute a character. I am amazed to learn what diverse characters different men impute to one and the same tree. (SCA: 75)

The passage can be read as generalising from the kind of reciprocal interaction with Silphium described in 'Prairie Birthday'. In the process of working with plants, they become 'personified' – yet this personification has little to do with a facile attribution of human characteristics to beings that are fundamentally unlike humans. It does not require 'empathy', which assumes a 'substantial sameness of the empathizer and the empathized' (Marder 2012: 260). Importantly, the fact that different people attribute 'diverse characters … to one and the same tree' does not entail the kind of arbitrariness that is usually implied when we call people's views 'subjective', because the trees here are not just passive 'objects': the biases people form with regard to trees reflect not just differences between people, but rather differences between the kinds of relationships that have emerged between them. Insofar as these are relationships of resonance in Rosa's sense – that is to say, relationships in which humans become particular kinds of subjects by responding to a world that likewise responds to them (Rosa 2019: 453) – the question with which Leopold concludes his list of possible motivations for his bias is indeed strictly unanswerable: 'is the difference in the trees, or in me?' (SCA: 74)

The wholly unrestrained anthropomorphism of the second subchapter which focuses on pines should be read in light of these considerations. In 'Pines Above the Snow', Leopold describes pine trees as 'thrifty,' because 'they never pay current bills out of current earnings' (SCA: 88), and as engaging in 'much small-talk and neighborhood gossip', because the condition of the pine trees reveals 'the gastronomic status of the deer' and other animals in the vicinity (SCA: 89). White pines, red pines,

and jack pines, the reader learns, 'differ radically in their opinions about marriageable age' (i.e., they start blooming at different ages – SCA: 90), and, 'like people, are choosy about their associates' (SCA: 91). Indeed, 'each species of pine has its own constitution, which prescribes a term of office for needles appropriate to its way of life' (SCA: 92). By the end of the chapter, the conceit wears rather thin. Yet what is happening in these passages is not merely a matter of naturalising civic virtues by projecting them onto plants; nor is the anthropomorphic allegory only a vehicle for botanical information. Rather, I would argue, Leopold seeks to convey the intimacy of a relationship which affects him as much as it does the trees under his care. As Rosa writes, this is a relationship that cannot be established through 'cognitive learning processes and rational insight, but results from practical and emotionally significant engagement' (Rosa 2019: 461).

While such 'engagement' has an important aesthetic component, Leopold insists that it is above all a matter of labour on the land. Once again, it is worth recalling that the vast majority of the pines he is writing about here would have been planted either by him or by the members of his family. *A Sand County Almanac* as a whole is suffused by a profound scepticism as to whether industrial civilisation will indeed be able to change. The ecological restoration project on Leopold's Sauk County property was an attempt to reverse at least some of its devastating effects, and to chart a different course for the future. Leopold was far from certain about the outcome of this experiment. Of the 2,000 pine trees planted during its first Spring, hardly any survived until the end of the year, and it took many years before the family's labours started to show results (Meine 1988: 365). One must keep this in mind to fully appreciate the pathos of the closing paragraph of 'Pines Above the Snow':

> It is in midwinter that I sometimes glean from my pines something more important than woodlot politics, and the news of the wind and weather. This is especially likely to happen on some gloomy evening when the snow has buried all irrelevant detail, and the hush of elemental sadness lies heavy upon every living thing. Nevertheless, my pines, each with its burden of snow, are standing ramrod-straight, rank upon rank, and in the dusk beyond I sense the presence of hundreds more. At such times I feel a curious transfusion of courage. (SCA: 93)

V.

I suggested at the outset that *A Sand Country Almanac* proposes to its readers a notion of 'vegetal citizenship'. As should be clear by now, what the text has in mind has little to do with chartered rights and duties. What should also be clear, however, is that when Leopold speaks of citizenship in the biotic community, he is neither limiting the use of the term to humans or animals, nor is he suggesting that humans should start handing out metaphorical passports to other species. In matters of biotic citizenship, it takes one to know one: in order to become able to recognise plants as fellow citizens, we must turn ourselves, or be turned, into citizens of the land community. To become such a citizen is to enter into a relationship of resonance which transforms all parties involved.

The answer Leopold provides to the question with which I opened this essay – what do we owe to plants? – is therefore not one that could be formulated in deontological terms, as a matter of rights and duties, even though Leopold tried to do exactly that in 'The Land Ethic', tempting many of his philosophical interpreters to follow him down the same path. However, relationships of the kind he writes about so eloquently elsewhere in *A Sand Country Almanac* cannot be prescribed: we do not fall in love by decree, and to command gratitude is to falsify in advance all expressions of it. That is why Leopold is rather dismissive about the Mosaic decalogue (SCA: 238), and only slightly less so about contemporaneous efforts to regulate farming practices through the creation of new laws and governmental institutions (SCA: 109), even when he recognises their necessity. Since we owe everything to plants, no list of obligations could ever suffice to acquit ourselves of our debt. What we owe to Leopold is much easier to specify: to read the *Almanac*, and to take it as a powerful example for 'what [it] would … look like to move through the world in a way that both acknowledges and gives back to the trees' (Sandilands 2021: 780).

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Dangerous Resonances in Charlotte McConaghy's *Once There Were Wolves*

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ABSTRACT

Charlotte McConaghy's novel *Once There Were Wolves* tells the story of the reintroduction of wolves in the Scottish Highlands, thereby bringing the concept of rewilding – an innovative form of biodiversity conservation – into fiction. This novel shows how, within the paradigm of biodiversity, 'plant perspectives' and the search for a language of resonance must be considered in the broader ecological context, alongside the wolves. The article analyses how the novel highlights the importance of resonance through the protagonist Inti Flynn's special relationship with plants, while also critically reflecting on this concept by depicting a resonance catastrophe – arising from Inti's overly symbiotic relationship with her sister and the wolves. The conservation effort only succeeds, and the trees begin to grow over the bare hills, when Inti and the initially opposed local sheep farmers come together. Thus, this article argues, the novel demonstrates that contemporary conservation issues require a critical discussion of both the lack and excess of resonance in our relations to nature, fostering a mutual transformation of both ecologists and the local population in their relationships with each other and with nature.

KEYWORDS

resonance, biodiversity, conservation, ecology

harlotte McConaghy's 2021 novel, *Once There Were Wolves*, accomplishes two things which are quite unique in the context of literature that deals with biodiversity conservation and also elaborates on how to contribute to solving the ecological crisis by telling a fictional story: first, it portrays the concept of rewilding within a fictional narrative; second, it reflects on the significance and the danger of resonance in the implementation process of such an innovative conservation project.

The story is told by the main protagonist Inty Flynn who works for the organisation 'Wolf Trust' which started as the 'Cairngorms Wolf Project' in collaboration with 'Rewilding Scotland'. Several wolf packs are being reintroduced to manage the deer population and prevent them from eating the trees to which Inti, as I will show, has a special relation. The rewilding initiative aims to facilitate the reforestation of the barren hills and restore the ecosystem – but it is a project that faces resistance

from the local community which depends on sheep farming for its livelihood and which is afraid of the damage that the wolves may cause.

With this, the novel raises the question of how a new relationship between humans, wolves, and trees can be established. In its fictional adaptation of this new conservation approach, it demonstrates the ability of literature to integrate various perspectives and thereby also identify potential challenges. Unlike most conservation debates, which only consider such rewilding projects from an ecological perspective, the novel integrates the social and interpersonal questions that accompany the establishment of such a new relation to nature in all its ethical, aesthetic and affective dimensions.

In this case it is a conflict between two different worldviews: the rewilding enthusiasts with their 'biophilia' (Wilson 1984) on the one hand and the resource oriented, anthropocentric perspective of the locals on the other. But it is also a conflict that arises because of what I would call a 'resonance catastrophe', a term normally used for a bridge collapsing when soldiers' marching in step collides with the bridge's own natural frequency. While resonance typically involves two distinct frequencies coming together, meaning both bodies resonate with their own voices, in this case mutual amplification leads to destruction. The novel shows how Inti's excess of selective empathy and resonance leads to an escalation of the conflict and a catastrophe that casts a critical light on the current discourse around symbiosis, empathy and resonance.

In the following discussion, I will first focus on the concept of resonance and then demonstrate, through the novel's conflict progression, how resonance is conceptualised and critically reflected upon, ultimately leading to a new relationship among humans and between humans and biodiversity. The term I would like to borrow from Anna Lowenhaupt-Tsing to describe this conflict-laden process is 'productive friction': 'the awkward, unequal, unstable, and creative qualities of interconnection across difference' (Lowenhaupt-Tsing 2005: 3).

DANGEROUS RESONANCES

'When we were eight, Dad cut me open from throat to stomach' (McConaghy 2021: 1). This first sentence of the novel is not only powerful and disturbing and immediately raises the question of how this

voice with a slashed stomach is still able to narrate. It also makes it clear that the resonances in this novel are the opposite of harmless and harmonious: 'I had always known there was something different about me', Inti Flynn admits, 'but that was the day I first recognized it to be dangerous' (McConaghy 2021: 2). Her mirror-touch synaesthesia momentarily turns her into the hare her father is just killing. Inti describes her brain's special ability to replicate the sensory experiences of living beings,[1] which heightens resonance to a momentary state of identification, as an amplification of the so-called normal state of the brain, because every human being has a tendency towards empathy: 'We are hardwired for empathy' (McConaghy 2021: 2).[2] This human tendency towards empathy is highlighted in the novel through the special condition and is made the subject of a social experiment.

The ability for empathy, on one hand, and the necessity for critical distance, on the other, are two opposite positions embodied rather schematically by Inti's parents in the novel. Inti and her twin sister, Aggie, grow up between a mother who prosecutes femicides and other acts of violence committed by men against women, and a father who lives in the woods as a self-sustainer. The mother distrusts everyone and attempts forcibly to build a protective shield for Inti, because she fears that her daughter's mirror-touch synaesthesia will make her experience all the evil that exists between humans with her own body. In one scene she cuts into her own fingers and thereby into those of her daughter, until Inti can no longer feel anything. But, of course, she cannot cure her daughter with that either (McConaghy 2021: 19–20). The father, on the contrary, firmly believes in a love that exists between all living beings and teaches his daughters the language of resonance during the periods when the three of them live together in the wilderness of British Columbia for several months each year. Unlike the mother, who wants to protect Inti from her special condition, he regards her mirror-touch synaesthesia as the 'greatest gift'; he believes that empathy and compassion are the most important qualities in life (McConaghy 2021: 36). It's hardly surprising that Inti feels closer to her father and his way of

1 'My brain recreates the sensory experiences of living creatures, of all people and even sometimes animals; if I see it I feel it, and just for a moment I am them, we are one and their pain or pleasure is my own.' (Ibid.: 6)

2 For the theory of mirror neurons underlying this statement, see Rosa 2016: 246–69.

thinking: 'I chose to live by my dad's code, and it was easy until it wasn't' (McConaghy 2021: 36). While Inti acknowledges the potential risks associated with her mirror-touch synaesthesia from an early age, only after the escalation in the context of the rewilding project does she realise that her mother could be correct, and she begins to understand that this unique ability is not only her greatest strength but also her greatest weakness.

With this, the novel accomplishes more than many theoretical elaborations on the concept of resonance: for instance, Hartmut Rosa, in his comprehensive study on the subject, has emphasised the importance of resonance without adequately reflecting on its potentially problematic aspects. Only after approximately 280 pages of his extensive theory, does he refer for the first time to the physical phenomenon of 'resonance catastrophe'. Rosa himself quotes the example of a bridge collapsing when soldiers in-step marching collides with the bridge's own natural frequency (Rosa 2016: 282). However, his theory could have benefited from a more critical examination of the phenomenon, similar to what Fritz Breithaupt (2017) has done for the related concept of empathy.

Such critical perspectives on empathy and resonance would be particularly important for the current ecological discourse. While, following in the footsteps of Rosa, resonance is currently seen as an important element in overcoming the social-ecological crisis (Artmann 2023), a better integration of critical positions, as articulated for example by Niklas Luhmann in 1988 are needed. Luhmann identified not only lack of resonance but also excess of resonance as potential dangers. He rather prophetically foresaw that ecology and politics could intensify each other to such an extent that they would lead to 'escalation of resonance', ultimately resulting in a resonance catastrophe characterised by mutual negation and paralysis (Luhmann 1988: 225–26). In order for positions like these to regain a stronger presence in the current ecological discourse, it is essential to have texts like McConaghy's, which, while it does not tackle structural issues and largely overlooks the political dimension, still demonstrates on the level of a local community what I, with reference to Lowenhaupt-Tsing, call 'productive friction'.

HUMAN-TREE RELATIONS

I will now first trace the process by which the novel builds the concept of resonance and then show how the resonance catastrophe unfolds. As I have already mentioned, Inti's father represents the possibility of a language of resonance between humans and non-human beings. Particularly significant in this regard are the plants, especially the trees, which shape Inti's childhood memories. The father teaches his girls how to believe 'the trees of this forest [as] our family' and how to listen to their language coming from a 'beating heart we can't see': '"It's here, beneath us"', the father tells them,

> 'This is how the trees speak with and care for each other. Their roots tangle together, dozens of trees with dozens more in a web that reaches on forever, and they whisper to each other though their roots. They warn of danger and they share sustenance. They're like us, a family. Stronger together. Nothing gets through this life alone.' He smiled then, and asked, 'can you hear the beating?' and we could, somehow we could. (McConaghy 2021: 15)

These statements by the father paradigmatically represent the discourse surrounding the so-called 'Wood Wide Web',[3] as discussed by authors like Suzanne Simard (2021) or Peter Wohlleben (2015).[4] The notion that trees are interconnected through their roots, the hypothesis that they assist each other and the metaphor of a non-semiotic language of heartbeat are all elements of the currently fashionable ecological discourse on interspecies resonances.

There are three main episodes that characterise this relationship of resonance and the significance of trees for Inti: on one occasion, the father leads his two daughters to a place where all the trees have been cut down, leaving only one large, old Douglas fir standing amidst the desolation. This fir, 'was to be the tree that would change his life'; it was the catalyst for the father's transformation from a logger to a conservationist (McConaghy 2021: 17). The moment he saw it during a logging operation, he was so impressed that he decided to save it and to quit his profession. When Inti asks her father if the tree is lonely, he affirms it,

3 The term 'Wood Wide Web' was coined by David Read and was used on the cover of *Nature* to draw attention to the influential study by Simard et al. 1997.

4 The English translation of the book was published only a year after the original: Wohlleben 2016.

as the tree is 'one of the last of its kind': 'It's a threatened species now. Ninety-nine per cent of old-growth Douglas firs have been cut down' (McConaghy 2021: 17). The old and lonely Douglas fir in this scene becomes a symbol of species extinction and what E.O. Wilson referred to as the 'Eremozoic era', or 'the age of loneliness'.[5]

In the second episode, many years later, Inti takes her father and Aggie to visit the largest and oldest living being on earth, the 'trembling giant' Pando, as she explains to them, 'the oldest living thing on this planet, and the largest'; all his individual trees are each part of this one single enormous organism (McConaghy 2021: 72). They undertake this journey with the aim of healing their father: although Inti's father initially asserted the importance of unity, he has consistently led a solitary life with minimal social connections. At some point during Inti's and Aggie's youth, he gradually slipped into a state of mental absence, leading to moments of forgetfulness about his surroundings and occasional displays of aggression (McConaghy 2021: 70). In this scene, the fear of losing the connection to the father is closely intertwined with the apprehension of losing this remarkable organism, as articulated by Inti: '[I]t's dying. We're killing it' (McConaghy 2021: 72). As the father connects with Pando, he momentarily recognises his adult daughters. Inti, overwhelmed by this sensation, is also able to open herself to this experience of connection, both with the human and non-human members of the family: 'I pressed my cheek to one of the tender, elegant trunks. Wind whispered through its naked branches and against my eyelids, my lips. A kiss. I could almost hear it breathing, could feel its heartbeat beneath and around and above me, the oldest language of all' (McConaghy 2021: 72). Similar to her childhood experiences when she first sensed the Wood Wide Web and her connection to it, this also constitutes an immersive resonance experience. It emerges as a connection through a non-semiotic language between her and the Pando, and also with her father. Pando, whose name signifies 'I expand' and represents both an individual and a system, asks for a re-evaluation of the concept of 'tree-ness' (Fredericks 2023: 134). Thus, this episode in the novel serves as a significant symbol of a paradigm shift towards a

5 'The human hammer having fallen, the sixth mass extinction has begun. This spasm of permanent loss is expected, if it is not abated, to reach the end-of-Mesozoic level by the end of the century. We will then enter what poets and scientists alike may choose to call the Eremozoic Era – The Age of Loneliness' (Wilson 2016: 9).

particular focus on symbiotic and resonant relationships, as expressed by Scott F. Gilbert, Jan Sapp and Alfred I. Tauber in the slogan: 'We are all lichens' (Gilbert, Sapp and Tauber 2012: 341). In this part of the plot, the novel represents an attempt to acknowledge mutual dependencies as the foundation for a changed relationship with nature.

In the third scene, situated at the end of the novel, Inti is once again leaning against a tree, this time giving birth to her child. This happens when she is on her way home on a freezing night after having had to kill one of the wolves, and, again, she is accompanied by the trees: 'The trees above and around. They sway. I am home here, and so glad. It is right that I'm here after all. It was always going to be here' (McConaghy 2021: 240). While the birth itself happens relatively quickly, the long journey back home through the snow and the night poses a significant danger to her and the child. However, the forest and its inhabitants come to their aid: She sees her long-deceased father leading her through the darkness before he disappears in the snowfall (McConaghy 2021: 241–42). At one point, she no longer has the strength to continue and finds herself surrounded by wolves. They don't attack her, but gather protectively around Inti and the child, providing warmth and safety (McConaghy 2021: 242–23). In this scene, the fantasy of resonance is taken to the extreme, showcasing a successful interplay between humans, trees and wolves.

From this brief overview of the tree-centred episodes, it becomes evident that the novel establishes a language of resonance, particularly through the adaptation of the ecological discourse concerning the Wood Wide Web and tree communication. The criticism regarding the lack of scientific evidence behind these narratives, and especially the so called 'Wood Wide Web', formulated, for example, by Justine Karst et al., is not taken into account (Karst, Jones and Hoeksema 2023). Rather it becomes clear that these scenes exemplify in an almost prototypical manner that nature has become, as Hartmut Rosa described it, 'one – or perhaps even the – central resonance sphere of modernity' (Rosa 2016: 455–56).[6] The main motivation for the biologist Inti in her fight for conservation is what Rosa refers to as the 'ecological fundamental fear

6 Translations from this book are my own; in the original: 'Tatsächlich ist jene Emanzipation die Voraussetzung dafür, dass die Natur zu einer – oder vielleicht sogar zu *der* – zentralen Resonanzsphäre der Moderne werden konnte.'

of late modernity': 'Not that we might lose nature as a resource, but that nature could fall silent as a resonance sphere' (Rosa 2016: 463).[7]

However, there are already some fractures in this picture of resonance: Inti and Aggie fail to rescue their father from his increasing isolation, leading him to one day disappear into the forest – merging into one with it, but also abandoning his human existence. Consequently, the resonance relationships in these three scenes are marked by some elements of uncertainty: in the above quoted scenes of her childhood and with the Pando, Inti only hears the heartbeat of the trees 'somehow' (McConaghy 2021: 15) and 'almost' (McConaghy 2021: 72). The childbirth scene in which the wolves keep her and the baby warm could be described as 'kitsch' in the sense that it is naively comforting, to use Adorno's definition (Adorno 1970: 248), [8] if not adhering to the conventions of a fairytale, a genre with which the novel already plays through its title. Thus, a marker of uncertainty is also introduced here: Inti wakes up alone in the morning and wonders 'if they were real' (McConaghy 2021: 244).

With the introduction of this language of cross-species relations, the novel slightly pushes the boundaries of what we consider possible in reality. At the same time, it also highlights that resonance is the result of our ability to compare, to imagine and to desire – and of the rhetorical strategy of metaphors.

PROBLEMS OF REWILDING IN THE PARADIGM OF BIODIVERSITY

The forest that continually 'calls' (McConaghy 2021: 253) and speaks to Inti is the centre of the novel, making it an example of 'plant perspectives'. But it is not presented for its own self. Rather the return of the trees to the Scottish mountains is depicted in the context of cross-species relationships with the wolves.

In doing so, the novel positions itself also as part of what I would call the transformative paradigm of biodiversity – that is, a new way of

7 In the original: Die 'ökologische Grundangst der Spätmoderne' and: 'Nicht dass wir die Natura als Ressource verlieren, sondern dass die Natur als Resonanzsphäre verstummen könnte.'

8 In the original: 'mit einem Beiklang des dümmlich Tröstenden'.

perceiving and narrating 'nature'.[9] Biodiversity, a term coined in 1986 (Takacs 1996), is both an ecological concept and an 'a term of action' (Norton 2007: 369) bridging science, politics and society. It is associated with a new perspective that does not view the collective singular 'nature' as something opposed to humans but instead places the complexity of cross-species relations at its centre. In this sense, the novel no longer focuses on species preservation in the traditional sense or the conservation of an intact nature but rather on the coexistence of various (also re-introduced) species.

This also means that, even though the trees are central to Inti as 'family members', the novel shows that the search for a language of resonance is about the complex relationships within ecosystems.[10] The extent to which the novel is part of this paradigm can be exemplified by the following passage, in which Inti gazes on the landscape where her rewilding project is situated:

> Not long ago, not in the grand scheme of things, this forest was not small and sparse but strong and bursting with life. Lush with rowan trees, aspen, birch, juniper and oak, it stretched itself across a vast swathe of land, colouring Scotland's now-bare hills, providing food and shelter to all manner of untamed things.
> And within these roots and trunks and canopies, there ran wolves.
> Today, wolves once again walk upon this ground, which has not seen their kind in hundreds of years. Does something in their bodies remember this land, as it remembers them? It knows them well; it has been waiting for them to wake it from its long slumber. (McConaghy 2021: 5)

The phrase 'bursting with life', the enumeration of various tree species with their diversity of colours and the reference to the function of these trees for 'all manner of untamed things', meaning various wild animals and the home they make for the wolves, all represent the biodiversity discourse, which consistently emphasises the variety and beauty of co-existing life forms. Moreover, the depiction of wolves moving

9 Cf. my current research project at the University of Zurich with the title 'Narrating Variety. Biodiversity as Paradigm of Transformation in Science and Literature': https://www.ds.uzh.ch/static/cms/pfs/personen.php?detail=402&get=rs (accessed 30 Sept. 2023).

10 In a typical manner for biodiversity narratives, the relationship between the forest and the wolf as a charismatic mammal species stands *pars pro toto* for the complexity of all living diversity. In her book *Imagining Extinction*, Ursula Heise (2016) shows how many biodiversity narratives employ the rhetorical device of synecdoche (pp. 22–24).

among the roots, trunks and canopies, along with the emphasis on the mutual memory shared by the landscape and the wolves, illustrates that biodiversity is framed as a relationship of resonance in this novel. Like in a fairytale, they awaken each other from a 'long slumber'.

This also shows how the paradigm of biodiversity is connected to the goal of seeing nature in a new way. In the words of David Takacs, who has extensively examined the idea of biodiversity: 'Conservation biologists have generated and disseminated the term biodiversity specifically to change the terrain of your mental map, reasoning that if you were to conceive of nature differently, you would view and value it differently' (Takacs 1996: 1). This is precisely the position held by Inti and her team from the 'Wolf Trust' organisation, as they articulate at the beginning of the novel in the context of an information evening for the local villagers: 'What we have here in Scotland … is an ecosystem in crisis. We urgently need to rewild' (McConaghy 2021: 23). The reintroduction of the wolf as apex predator in a trophic cascade would have the potential to reforest the barren hills of Scotland and simultaneously engage in climate and biodiversity conservation, as Evan promotes: 'With their [the wolves'] return the landscape will change for the better – more habitats for wildlife will be created, soil health increased, flood waters reduced, carbon emissions captured. Animals of all shapes and sizes will return to these lands' (McConaghy 2021: 23). In this way, the novel situates itself within the ecological discourses that associate the loss of large herbivores and carnivores in our landscapes with ecosystem degradation. Since the groundbreaking Rewilding Project in Yellowstone Park, where wolves were reintroduced in 1995/6, the positive effects, particularly on forest regeneration and biodiversity, have been extensively studied (Beschta and Ripple 2016).[11]

However, the implementation of such projects is by no means easy – neither in reality nor in the novel. As George Monbiot describes in his book *Feral*, there are efforts also across Europe, including those led by the organisation Rewilding Europe, founded in 2011, to reintroduce bears, wolves, lynxes, as well as bison and wisent (Monbiot 2013: 106).[12]

11 For the current state of positive effects cf. https://www.yellowstonepark.com/things-to-do/wildlife/wolf-reintroduction-changes-ecosystem/ (accessed 30 Sept. 2023).

12 On the state of the current discussion, cf. e.g.: https://www.theguardian.com/environment/2020/nov/24/landscape-of-fear-why-we-need-the-wolf-rewilding-scotland (accessed 30 Sept. 2023).

In the UK, such projects have not progressed as far as in other parts of Europe. One reason for this is the geographical isolation that makes it challenging for animals, particularly wolves, to migrate naturally into the area.

Monbiot describes his encounter with Alan Watson Featherstone, the founder of Trees for Life, a conservation organisation dedicated to restoring the Caledonian Forest. According to Monbiot's account, Featherstone shared a vision during their walk that goes far beyond merely planting trees: 'My aim is to have wolves back in Scotland by 2043. That would be 300 years after the last one is said to have been killed here. It's one generation from now. Ecologically, they could live here today. The obstacles are cultural and economic' (Monbiot 2013: 106).[13] Monbiot, who at this point seems to be hearing for the first time from someone genuinely committed to implementing this idea, expresses his astonishment: 'Was this possible? Permissible? Even to imagine?' (Monbiot 2013: 106). *Imagining* the wolf's return has considerably expanded in the decade since the release of Monbiot's book. It is likely that Featherstone's imagination of reintroducing wolves in the Caledonian Forest served as an inspiration for the organisation 'Rewilding Scotland' in McConaghy's novel.

The novel is an example of '*littérature engagée*' because it illustrates how contemporary literature can engage with very specific ecological and conservation topics in the current context of climate crisis and biodiversity loss. It takes on a mediating role in conveying this ecological knowledge to an audience that might not otherwise be exposed to it. And it does even more. While George Monbiot dismisses the reasons for the difficult implementation of rewilding in Britain with the statement, 'Perhaps Britain is the most zoophobic nation in Europe' (Monbiot 2013: 106), the novel demonstrates that such overbearing attitudes among ecologists and their resonance fantasies are also part of the problem. It shows that the aim associated with the biodiversity paradigm – to change the mental maps – does not follow the pattern of a fairytale but requires an engagement with the fears of the local population.

13 Since Featherstone has not yet been able to realise his dream, he resorts to using 'human wolves' to scare away the red deer: https://alanwatsonfeatherstone.com/a-night-with-the-wolves/ (accessed 30 Sept. 2023).

SOCIAL TRANSFORMATION

On the evening when Evan presents the rewilding project to the villagers, he does so in the fashion of a typical researcher by presenting data on ecosystem degradation and its restoration. The reaction to his speech among the villagers varies 'between pissed off, bored, and plainly confused'. (McConaghy 2021: 23) When Inti tries to address the deeply rooted fear that wolves would attack humans, she reverses the perspective: 'We [the humans] are the people killers, the children killers. *We're* the monsters' (McConaghy 2023: 26). But this sentence obviously further escalates the tensions between her team and the locals – not least because, as it will turn out in the end, this sentence is a truly dramatic irony.

The escalation occurs, on the one hand, as a conflict between the local population and the wolf scientists and shows how conservation projects should not be done to the people but with the people. From that information evening onwards, a negative dynamic unfolds: Inti and Aggie are threatened and a wolf is shot by a villager. There is a human death and Duncan MacTavish, the police officer who becomes Inti's lover and the father of her child, is attacked and his dog brutally killed. It is a fight based on the mistrust between the two frontiers of the locals and the ecologists.

Yet, on the other hand, it becomes increasingly clear over the course of the novel that this conflict is not just about the two value systems of the wolf scientists and the sheep farmers, but that also a dangerous resonance catastrophe is unfolding: step by step the reader learns about Aggie's traumatic past, dominated by domestic violence. In the present of the plot, Aggie is mute and unable to care for herself, never leaving the house. Inti and Aggie continue to live in their symbiotic relationship, but Aggie has more and more become Inti's 'shadow sister': the sister hidden from everyone, but also – metaphorically – Inti's dark part that is always with her and only sets her free at the very end to live her own life (McConaghy 2021: 248). And finally, it is revealed, as Inti has not been able to see because of their close relationship: it was not, as assumed by the villagers, the wolves that committed the violent crimes, but Aggie (McConaghy 2021: 246–48). Officially the story of the wolf attack is maintained, but, for Inti, this insight is bitter as she realises who actually was the 'monster': '[A]s it turns out, we were the ones

who couldn't be trusted' (McConaghy 2021: 249). The dramatic irony is fulfilled.

Not only does Inti have to admit that her attempt to protect the wolves has failed and the locals' prejudice is confirmed. What is even more significant is that Aggie, who seemed closest to her, was indeed a stranger. With the crime of Aggie, Inti's 'shadow sister' (McConaghy 2021: 248) being revealed, it becomes clear that neither the symbiotic relationship between Aggie and Inti nor Inti's special ability of empathy can protect their loved ones and the wolves. On the contrary, it is the excess of resonance in this relationship that leads to the catastrophe: Inti's symbiotic relationship with Aggie prevented her from perceiving the dangerous dynamics unfolding around her. Although she was aware that her special neurological condition could jeopardise the project's success, this self-awareness did not lead to a change in her behaviour. She remains blind to her sister's paranoia and her capacity to commit violence, and also to her own prejudices and her own trauma that she seeks to heal through the forest and the wolves.

At the end of the novel, the contrast between the visionary ecologists and the ignorant villagers has dissolved into ambivalences. Inti, from whose perspective the novel is told and who initially seems to be on the 'good' side because of her ecological consciousness and her ability of resonance and empathy, turns out to be the one causing violence and distress, together with her sister Aggie. She has to transform the pattern of empathy and critical distance that she inherited from her parents: the scepticism that Inti inherited from her mother is initially directed only towards the villagers, while the resonant love from her father is only focused on the trees and the wolves – a dichotomy that will be overcome only at the end of the novel. For this to happen, Inti must question her father's concept of resonance and the all-encompassing resonant love for all living beings, just like her mother who responds sarcastically to Inti's praises: 'You mean the madman who lives out in the wilderness alone and doesn't have contact with other humans? That Dad?' (McConaghy 2021: 35).

At the same time, the mother's cynicism, which is directed towards the villagers, is transformed: during this process, the villagers increasingly appear in a positive light as the story progresses. Inti enters a relationship with Duncan and becomes acquainted with the social structures and customs of the community. She joins the local knitting

club, of which her strongest opponent, Red McRae, is also a member (McConaghy 2021: 186–90). And it is precisely Red McRae who will ultimately save Inti's life in the cold night when she gives birth to her child (McConaghy 2021: 245). As Inti begins to recognise her own weaknesses and shortcomings, Red McRae confesses that he knew 'it was evil' (McConaghy 2021: 250) to shoot a wolf.

At the end, Inti observes the sheep famers watching the landscape with binoculars and she realizes 'that the wolves are working their way into the hearts of the Scottish people' (McConaghy 2021: 255). And her daughter can witness the first effects of the wolves in the designated area for the scientific study: the tender shoots of willows and alders (McConaghy 2021: 256). While the excess of resonance has led to the catastrophe taking its course, the 'encounters across difference' (Lowenhaupt-Tsing 2005: 6) create the form of a productive friction that, amidst all the suffering and failure, enables a shared social transformation: the intrinsic values on the one hand and instrumental values on the other have both transformed into relational values. This leads to a different relationship not only between the conservationists and the villagers, but also between people and nature. In this way, the novel makes it clear that resonance with plants does nothing, but that biodiversity as a resonant, cross-species relationship must coincide with social resonance.

THE MORAL ADVENTURE OF LITERATURE

Charlotte McConaghy's novel, which explores the implementation of a rewilding project in fiction, is a good example of what Corine Pelluchon has called the 'moral adventure' of literature (Pelluchon 2018: 185–222). It is a laboratory for something that is yet to emerge – something that is still far away from being enacted but which can be envisioned and experienced in the process of reading. Fiction enables a kind of experimental action, inviting us on an adventure for which we might not yet feel ready in our real lives. In this sense, the search for a language of resonance and the process of moving away from an excess of resonance, as I have illustrated through the plot, can also be applied to the level of reception. By adopting Inti's perspective, readers initially join her in searching for a language of resonance, symbolised by Inti's unique condition: literature

as the possibility of becoming someone else. In a second step, however, readers also experience with her the process of critical reflection, developing with her a form of multi-perspectivity that overcomes the resonance catastrophe caused by an excess of selective empathy directed towards the wolves and her twin sister.

The process Inti undergoes to reach this point can be described with Timothy Morton's discovery of himself as the 'tragic criminal':[14] 'I am the criminal. And I discover this via scientific forensics. Just like in noir fiction: I'm the detective and the criminal! … Ecological awareness is that moment at which these narrators find out that they are the tragic criminal' (Morton 2016: 9). Inti is both a detective and a criminal, who ultimately comes to recognise the 'monster' in herself, leading to a process of reconsidering her values. The novel shows how biodiversity conservation cannot be achieved through argument alone, as ecologically sound and ethically considered as that might be. Literature as an art based on temporality shows how a new identity-forming narrative can only emerge situationally and in a certain context through the process of living together and, in the case of this novel, in resolving conflicts, and negotiating fears, allowing for ethical transformation of both sides.

With Inti's discovery that she is both the detective and the criminal, there arises the possibility for readers to understand themselves within this ambivalence. Through the process of distancing and the development of multi-perspectivity in the novel, there is also a move away from identificatory reading processes, as symbolised by Inti's mirror-touch synaesthesia. The novel invites us, its reader, to discover the criminal within ourselves – that is, to reflect on where in the reality of our present there is too little resonance and where there is an excess of it, which, according to Luhmann, can lead to paralysis. The awareness of our own fallibility leads to the recognition that the current climate and biodiversity crisis involves all of us in various ways – not only because, as Morton notes, everyone contributes to it through their actions, but also because all the good intentions always fall short of comprehending the complexity of the causes of the crisis. The potential of this novel lies in showing that an ecological awareness emerges not only from advocating for rewilding but also from acknowledging this dialectic.

14 I would like to thank Solvejg Nitzke for this hint.

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Plant Worlds

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ABSTRACT

Plant communities create and enable most of Earth's living worlds by shaping ecological water and airflows, producing energy and matter through photosynthesis, and linking into vast, interconnected mycorrhizal fungal networks of communication to form interactive, multispecies, and distributive intelligences. We all live in various plant-formed worlds, an under-acknowledged fact in many extractivist cultures today. This essay briefly compares three works of science fiction featuring alien forest worlds that focus specifically on world-shaping vegetal power in which human or humanoid beings exist: Ursula K. Le Guin's 1972 *The Word for World is Forest*, Alan Dean Foster's 1975 *Midworld* and Marcus Hammerschitt's 1998 German novel, *Target*. These three texts immerse the reader in alien forest worlds dominated by plants that human beings try to exploit with various forms of failure. From these explicit failures in otherworldly realms, we find narrative options for reimagining our relationships and resonances with our own powerful vegetal beings back on Earth.

KEYWORDS

forest worlds, Ursula K. Le Guin, Alan Dean Foster, multispecies communities

INTRODUCTION: PLANT WORLDS BOTH EARTHLY AND ALIEN

While plant lives differ so greatly from human mobility, language and technological culture that they are easily dismissed as mere background or manipulatable matter – or, if one looks closely enough, like strangely vibrant, alien beings – they actively create the very possibility of our living worlds. Vegetal beings shape ecological water and airflows, they produce energy and matter through photosynthesis, and they link into vast, interconnected mycorrhizal fungal networks of communication to form interactive, multispecies and distributive intelligences. With all this activity, plant communities create and enable most of Earth's living worlds. We all live on a global world shaped by plants, and also in a vast array of smaller-scale plant-formed worlds, from forests to grasslands, deserts and even icy zones. From within, always within, plant-created worlds, human beings navigate oxygen-rich air with inevitable bodily resonances – breathing, eating and

building with plant products. Despite our fundamental and inescapable bodily resonances with plants, human cultural resonances are not always as clear, particularly recently. As Luce Irigaray writes in her joint philosophical contemplation of plants with Michael Marder, *Through Vegetal Being*, plants provide the oxygenated air for us to breathe, and birth is an emergence into the vegetally-enriched air. Yet, 'being born requires one to breathe by oneself. Instead of teaching me how to cultivate my breathing [indicating our plant-dependency], my culture had taught me how to suspend my breath in words, ideas, or ideals…' (Irigaray and Marder 2016: 20). Irigarary focuses on breathing as the activation of our concrete and metaphorical connection to vegetal life, and she continually returns to gardens and plant-rich areas to engage purposefully with what she terms the 'aerial placenta' (Irigaray and Marder 2016: 21). Our bodily resonance with plants is explicit in that our oxygen-seeking and carbon-dioxide producing lungs have the same shape as but inverse actions to vegetal oxygen-producing and carbon-dioxide-seeking forms like trees. Nevertheless, some human cultures, especially industrialised and extractivist ones, often overlook the relevance and vastness of vegetal impact and thereby interact with our world-shaping vegetal forms primarily as matter and food to instrumentalise or ignore other than when eating lunch or decorating our spaces. Literary texts offer many examples of overlooking plant power as the frame for our living worlds, but they also present alternative visions of consciously living immersed in plant worlds. Forest narratives present a particularly rich array of possible immersion scenarios or acknowledgments of our plant dependencies, scenarios in which humans do not always have control. In this essay, I briefly compare three works of science fiction featuring alien forest worlds where vegetal power cannot be overlooked: Ursula K. Le Guin's 1972 *The Word for World is Forest*, Alan Dean Foster's 1975 *Midworld* and Marcus Hammerschitt's 1998 German novel, *Target*. All three texts immerse the reader in alien forest worlds dominated by plants that human beings try to exploit with various forms of failure. From these explicit failures in otherworldly realms, we find narrative options for reimagining our relationships and resonances with our own powerful vegetal beings back on Earth.

Thinking about existing within plant worlds leads the editors of *Plants in Science Fiction: Speculative Vision*, Katherine E. Bishop, David Higgins and Jerry Määttä (2020), to write that: 'the way we think about

vegetation is not simply central to the way we think about ourselves or even humanity; the way we think about vegetation may also be key to our continued existence' (4). Indeed, looking at the long-term evolution of our living world in terms of plants, Michael Pollan declares that human beings are products of what he describes as vegetal desire, of plant reproductive strategies that evolved flowers and seeds. Such relatively new forms of energy, new at least in evolutionary terms, supported and still support all kinds of animal life including insects, birds and human beings. Pollan writes: 'Once upon time, there were no flowers—two hundred million years ago … This prefloriferous world was a slower, simpler, sleepier world than our own … The world before flowers was sleepier than ours because, lacking fruit and large seeds, it couldn't support many warm-blooded creatures … Flowers changed everything' (Pollan 2001: 107). The radical change brought by angiosperms with their sexy flowers and nutritious seeds meant that large animals could emerge. 'By producing sugars and proteins to entice animals to disperse their seed, the angiosperms multiplied the world's supply of food energy, making possible the rise of large warm-blooded animals … Without flowers, we would not be' (Pollan 2001: 108–09). In other words, this kind of larger scale, longer term vegetal production relates to our entire existence, our evolution and our ongoing ecological functioning. We human beings exist as an outcome of vegetal exuberance and long-term activities of plants.[1] The editors of *The Language of Plants: Science, Philosophy, Literature*, Monica Gagliano, John C. Ryan and Patricia Viera, present this power as follows:

> Plants are perhaps the most fundamental form of life, providing sustenance, and thus enabling the existence of all animals, including us humans. Their evolutionary transition from Paleozoic aquatic beginnings to a vegetative life out of water is undoubtedly one of the farthest-reaching events in the history of the

1 Similar claims about our resonance with other living things are made by many recent authors such as the editors of *Arts of Living on a Damaged Planet*, Anna Tsing, Heather Swanson, Elain Gan and Nils Bubandt (2017). For an impressive study of human civilisation in terms of plants, see Lincoln and Lee Taiz's (2017) book on plant sexuality that begins at the beginning when neo-lithic cultures began agriculture, and follows global cultures through the centuries in terms of their agriculture and moral debates about sex. The fact that the book focuses on understandings and denials of vegetal sex is rather ironically relevant for cultures whose very 'progress' depends on harnessing sexual products of plants such as seeds (rice, wheat, corn, barley, etc.) and fruits.

> earth. It was the silent yet relentless colonization of terrestrial environments by the earliest land plants that transformed the global landscape and radically altered the geochemical cycles of the planet. This resulted in lowered concentrations of atmospheric carbon dioxide and thus set the scene for the emergence of terrestrial animals about 350 million years ago (Gagliano et al. 2017, vii).

The very vastness and inhuman scale of plant life can make the sheer, overbearing power of vegetal impacts on our world fade behind our own short-term and dramatic transformation of the worlds we occupy. Interestingly, the concept of plant worlds may appear alien. Let us thus use narratives of alien plant worlds to remind us of our own plant dependencies from afar, so as to then rethink the shape of our own earthly communities.

II. URSULA K. LE GUIN'S *THE WORD FOR WORLD IS FOREST*

Le Guin's short novel or novella, *The Word for World is Forest*, inspires the title and topic of this essay. Her vision of the world is a forest, not world as earth/soil/clay. Her story takes place on a distant planet, Athshe, which is a forest world with land covered fully by trees and interrupted only by seas. It is populated by humanoid Athsheans who are green, furry and smaller in stature than human beings (who are called 'yumens' in the text as a form of textual alienation). Despite these external and visual differences, the Athsheans were seeded along with the familiar vegetation on the planet in the distant past by the Hanish and so are part of the larger system of interrelated and interconnected worlds that are featured in many of Le Guin's science fiction works. Representing an Indigenous culture that experiences a first encounter with colonising 'yumens' who come to cut down the forests for wood, the Athsheans are enslaved, murdered and raped. Furthermore, they are shocked by the yumen willingness to destroy the world – the forest, that is – with no thought to consequences. Indeed, having already depleted the Earth of virtually all living things whether plants or non-human animals, yumens now seek wood from other planets just as rapaciously. They deforest rapidly and without a care for the ecological impact or the meaning of the forest, and then they plant earthly agricultural plants, all of which rapidly leads to the same devastation of Athshe that occurred on Earth. This tale of a forest planet sets up a contrast between colonising yumens, who log, and native Athsheans, who live in the forest and know of their

interconnection with the trees. One cannot say that knowledge of living in a plant world immunises one from destruction; rather, the contrary appears to be true.

Giving the planet Athshe the colonial name of 'New Tahiti', the yumens are led and represented by men such as Captain Davidson, a caricature of a sexist, racist and capitalist coloniser. The story opens with his waking thoughts, both 'up' and 'down'. 'Up' is the arrival of 'the second batch of breeding females for the New Tahiti Colony, all sound and clean, 212 head of prime human stock', (Le Guin 1972: 9), a vision that immediately establishes his instrumentalising views broadly. Thinking of the '212 buxom beddable breasty little figures', he almost overcomes his dissatisfaction with the 'down' – the massive erosion that destroyed 'Dump Island' due to the destructive deforestation that he led, despite being told to leave some trees standing (Le Guin 1972: 10). Davidson enacts the stereotypes fully: human women are merely for sex and 'breeding', Indigenous people, the 'creechies', as they call them, exist solely for exploitation (including raping the women to death) and, eventually, extermination, as he notes, calling himself a 'conquistador', and trees are irrelevant other than as future logs:

> But he still couldn't see why a soybean farm needed to waste a lot of space on trees if the land was managed really scientifically. It wasn't like that in Ohio; if you wanted corn you grew corn and no space wasted on trees and stuff. But then Earth was a tamed planet and New Tahiti wasn't. That's what he was here for: to tame it (Le Guin 1972: 10).

Having 'tamed' Earth to be a mere concrete-covered death zone of overpopulation, the yumens arrived to 'clean up' this forest planet. Davidson muses: 'For this world, New Tahiti, was literally made for men. Cleaned up and cleaned out, the dark forests cut down for open fields of grain, the primeval murk and savagery and ignorance wiped out, it would be a paradise, a real Eden, a better world than worn-out Earth' (Le Guin 1972: 12). After only three months, huge swaths of forest are already gone and the damage is increasing without causing the yumens to change their approach. Le Guin presents the logging yumens as incapable of enacting a new strategy despite having already destroyed their home planet, Earth, and despite having a specialist ecologist present who warns them to log a little less rapidly.

Word for World is Forest begins, in other words, in the middle of the alien invasion of the deforesting yumens, and it begins with the overtly

problematic views of Davidson. But it then shifts in the second chapter to the Indigenous perspective, represented by Selver, a former slave whose wife was raped to death by Davidson before the narrative opens. In an unprecedented act of violence for the non-violent, non-murdering Athsheans, Selver had attacked Davidson and was almost killed. The third main character, Lyubov, whose importance is his work as a 'neutral' anthropologist and translator between cultures and languages, saved Selver's life as he was beaten nearly to death by Davidson; Selver then joined Lyubov to complete the essential translation work which also took place before the beginning of our story. The novella gives each of its three main characters individual chapters, one after another. First is Davidson, then Selver, then Lyubov, with three cycles of each until the end when Lyubov is dead and Selver has the last word in chapter eight. Selver's actions begin, however, already in Davidson's opening chapter when the yumen captain returns to camp after having visited the 'prime stock' of 'breeding females' only to find the camp burning and everyone dead. Selver, a dreamer, religious leader, a god of translation for the Athsheans, has learned killing from the yumens and has begun the revolution to save them and their forest world. He confronts Davidson with song, the Athshean equivalent of a duel, but Davidson lies on his back and cannot sing – a major defeat for the seemingly manly coloniser who plans to 'rub out' the Indigenous, which 'is just how things happen to be. Primitive races always have to give way to civilized ones' (Le Guin 1972: 21). Davidson does not admit his submission, and rejects the fact that he lost the duel. He spends the rest of the story destroying the forest, fire-bombing the forest villages of the Athsheans in a manner that Le Guin clearly uses to evoke the Vietnam war strategies, and defying even his superior officers. Finally, Selver and his fellow Athsheans win the war, arrest Davidson and exile him to the destroyed, over logged 'Dump Island', and save the future of the planet by taking on human/yumen strategies of murder, violence and death. It is a victory of sorts, but a terrible one enabled also by other outside intervention, which is noted below.

Selver's chapter, in contrast to Davidson's, first opens with the forest and the trees. In an exemplary literary representation of a sharp contrast between the human egotism and prejudice of Davidson and the Athshean cultural acknowledgment of being immersed in, and part of, a forest world, Le Guin dedicates a long, nearly two-page paragraph to

the lively forest itself before revealing Selver within the forest, walking along a path after having destroyed Davidson's camp. She deliberately uses the same words in this depiction that appear in Davidson's critique of the 'meaningless' forest, but now with a completely altered context that reveals the aesthetic marvel of the world/forest as the context *for* Selver and all the Athsheans. Davidson complains about the 'nothingness' of the forest as if representing a contorted and perverse 'western' philosophy:

> But when they came here there had been nothing. Trees. A dark huddle and jumble and tangle of trees, endless, meaningless. A sluggish river overhung and choked by trees, a few creechie-warrens hidden among the trees, some red deer, hairy monkeys, birds. And trees. Roots, boles, branches, twigs, leaves, leaves overhead and underfoot and in your face and in your eyes, endless leaves on endless trees (Le Guin 1972: 15).

The introductory paragraph for Selver uses some of this wording directly, but now in a manner that instead immerses us into the life of the forest, into the vegetal world of the Athsheans in a beautiful verbal painting of living communities. So it begins, with sensory immersion into colours, sounds, depth of the green:

> All the colors of rust and sunset, brown-reds and pale green, changed ceaselessly in the long leaves as the wind blew. The roots of the copper willows, thick and ridged, were moss-green down by the running water, which like the wind moved slowly … held back by rocks, roots, handing and fallen leaves. No way was clear, no light unbroken, in the forest. Into wind, water, sunlight, starlight, there always entered leaf and branch, bole and root, the shadowy, the complex' (Le Guin 1972: 35).

Le Guin here creates a philosophy of trees, not of the clearing or enlightenment or ultimate truths but rather of an entangled living community of the vegetal, the animal and the Athshean, Indigenous, human. Furthermore, the passage emphasises a multi-species community, a living collaboration: 'The ground was not dry and solid but damp and rather springy, product of the collaboration of living things with the long, elaborate death of leaves and trees; and from that rich graveyard grew ninety-foot trees, and tiny mushrooms…' (Le Guin 1972: 36). And then Selver appears, walking on a path. Immersed within the forest, he appears as a god to the Athsheans, who use the word 'god' also to mean 'translator'. Selver translates dreams into action and yumen behaviours into Athshean strategies of resistance with terrible fury. The

violence, however, does save the forest world in which they make their homes under the roots, as integral parts of the living community.

Notably, Selver also worked previously with Lyubov to create a dictionary of yumen-Athshean languages, an accomplishment that also helps save the planet in that the interstellar group of the League of Worlds arrives and declares Athshe free of exploitation after reading their collaborative work. For Le Guin, some violent resistance alongside the all-important communication enabled by both the translation work and an 'ansible,' which is her invented term for an instantaneous communication device that reaches across the universe, is the true and rather optimistic means of overcoming colonization and devastating deforestation. Understanding other cultures and peoples succeeds, even if it takes adopting extreme violence when the Athsheans are led by Selver to slaughter all the yumen females to prevent future generations. From Le Guin's *Word for World is Forest*, we understand that the goal is to achieve successful cross-species and cross-cultural communication. Such a possibility of understanding also involves acknowledging the shared origins of manifold beings and cultures regardless of their external differences. Although the Athsheans live in resonance with the forest, this long-term strategy of success does not protect them from exploitation. If Le Guin had not brought in the deux-ex-machina like communication device, the ansible, along with the intervention of the League of Worlds, they may have simply been decimated, if not immediately, then eventually, along with the forests of Athshea (and Earth). Still, Le Guin's somewhat hopeful message of cross-species communication in the forest, and cross-cultural communication across different peoples, though 'dystopian', according to David Landis Barnhill (2010), provides at least an imaginative possibility for recognising the power and inevitable if not always acknowledged resonance of the vegetal worlds in which we exist.

III. ALAN DEAN FOSTER'S *MIDWORLD,* A FOREST NOVEL

Much like Le Guin, Alan Dean Foster's alien forest world of *Midworld* presents a group of Indigenous people who live in and with the forest and who encounter 'alien' humans who have come to exploit the plant life for profit. Offering an exemplary vision of the reciprocal entanglement

and resonances of plants and humans in this lesser-known 1975 novel, however, the trees are not just the world, they are also sentient caretakers (as well as being, on occasion, predatory). Trees collaborate with and help the people, including the 'Home-trees', a name found also in James Cameron's famous 2009 film on another tree world, *Avatar*. Cameron does not name Foster specifically as an influence, but rather credits 'inspiration' from 'every single science fiction book I read as a kid' (Jensen 2007). Home-trees are, in any case, a major feature of both the famous film and Foster's forest world but in Foster's version, they are sentient and explicitly agential. They create the world of forest, and they rapidly cause the humans who landed there many years ago to adapt to live in the forest as a collaborative part of the multispecies community. The major contrast to Le Guin's world is the extreme danger of this sentient forest, for it is filled with hungry plants and animals of all kinds. The only hope is to know the forest and to adapt to its systems.

As a guide to this discussion of Foster's forest world, I follow Robin Wall Kimmerer's brilliant work combining Indigenous wisdom and scientific thinking in *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*. She writes that plant power most often succeeds best in multi-species collaborations. 'The mycorrhizae may form fungal bridges between individual trees, so that all the trees in a forest are connected. These fungal networks appear to redistribute the wealth of carbohydrates from tree to tree … They weave a web of reciprocity, of giving and taking' (Kimmerer 2013: 20). These reciprocal collaborations include many species from fungi to bees, birds and elephants, as well as human beings. The titular reference to sweetgrass exemplifies just such an example of plant-human care: 'Wild meadow sweetgrass grows long and fragrant when it is looked after by humans. Weeding and care for the habitat and neighboring plants strengthens its growth' (Kimmerer 2013: 62). Kimmerer's work presents collaboration as the primary form of plant-human existence, at least when done successfully. Her insights demonstrate the reciprocal interactions undergirding much of life that are also revealed, albeit with a lot of danger and in many wildly imaginative alien forms, in Foster's novel.

Midworld's lush green forest covering the entire planet is composed of trees so tall that they create seven different levels of life, each one a separate ecosystem of altitude rather than latitude and longitude: 'There were seven levels to the forest world. Mankind, the persons, preferred

this, the Third. So did the furcots. Two levels rose above this one, to a sun-bleached green roof and the Upper Hell. Four lay below, the Seventh and deepest being the Lower and True Hell, over four hundred and fifty meters below the home' (Foster 1975: 9). At the top two levels, 'Upper Hell', enormous predators flap or float above the sequoia-dwarfing trees seeking any sign of life/prey below. In the Third level, with enough light to thrive but with cover from the huge flyers, live the people, the once human survivors from a crash generations ago lost to time and forgotten by the rest of the space-faring worlds. They were very rapidly altered by their interactions with the plants, who clearly aided their evolution into better climbers with smaller height, longer, grasping toes, strong shoulders. They also gain the ability to communicate emotionally with plants so as to pick only fruit that indicates it is ready to be picked. This skill is called 'emfoling' in the novel and it is an overt form of plant-human emotional and communicative resonance. In the deepest levels of the world one finds 'Lower Hell', existing in full darkness except for glowing fungal bioluminescence. From the swampy ground and lightless water, where enormous fish-like predators hunt, arise the vast tree bases. Foster creates this vertically-divided world as a verdantly explosive realm filled with an astonishing array of threats both floral and faunal. One only survives by understanding one's position within the forest and by being aware of the inevitable (and inescapable) resonance with plant lives.

The young-adult novel opens when the youthful protagonist, Born, a hunter out to find impressive game to win over the lovely girl, Brightly Go, spots a strange silver shape below in the trees, a crashed flyer containing 'giants', or 'giant' human beings (from the perspective of Born's smaller, tree-people). He brings the giants to the Home-tree and then helps them travel through the forest back to their extractivist site. They serve to represent the unknowing and oblivious culture seeking only profit and mocking Born and his people for their connection to the forest. As Robert Pogue Harrison explains in *Forests: The Shadow of Civilization*, there has long been an assumption in 'Western' cultures that creating civilisation occurs by cutting down forests to make space for human developments and agriculture. Therefore, Harrison notes, it is often claimed that forests and forest people represent the 'opposite' of civilisation: 'To burn out a clearing in the forest and to claim it as the sacred ground of the family – that, according to Vico, was the

original deed of appropriation that first opened the space of civil society' (Harrison 1992: 6). The prejudice against forest-dwelling cultures is based on the idea, according to Harrison, that 'forests mark the provincial edge of Western civilization' (Harrison 1992: 247); the implications are that anything *inside* the forest is *outside of civilisation* where outlaws live.[2] Foster's novel suggests that industrialised and extractivist civilisation is, in contrast, the uncivil form, and he presents in no uncertain terms the ignorance and horror of the corporate representatives' cruel exploitations. In a conversation, Born counters their cold-hearted utilitarian sense of the forest with his explanation of living as a part of the forest, not as users of it: 'We do not use the forest. We are a part of the forest, the world. We are a part of the cycle that cannot be broken. We no more use the forest than the forest uses us' (Foster 1975: 67).

The company, in contrast, is there to find something for profit, at all costs, and in secret. This pharmaceutical group discovers burls growing from the trees that provide a life-extending substance worth unimaginable amounts of money. We learn, however, that these are the burls growing out of special burial trees, the 'They-Who-Keep,' out of which the 'furcots' emerge. The furcots are large, green-furred, sharp-clawed and tree-produced, photosynthesising animal beings whose purpose is to communicate and collaborate with the indigenous humans. In fact, the trees produce a baby furcot at the moment of every human birth; the two beings become life-long companions who cannot survive without each other: 'every person has his furcot and every furcot its person, as every flitter its blossoms, every cubble its anchor tree, every pfeffermall its resonator. It's the balance of the world' (Foster 1975: 49). In other words, the furcots' relationship with humans embodies plant-human resonance. When Born and his fellow hunter learn of this unspeakable plan to exploit the burls after having accompanied the visitors back to their lab, the two remain silent but decide for that reason to destroy the entire installation. The extractivists are destroying the plant-human-furcot resonance while having no comprehension of, or care about, what they do. Born's team destroy the construction with the help of the forest: they connect the site with naturally conducting vines to a 'Stormtreader'

2 See also Sara Maitland, *From the Forest: A Search for the Hidden Roots of Our Fairy Tales* (2012), for more on the association of forests with outlaws and as realms outside of civilization.

tree, the trees that attract and store lightening energy thereby helping the forest avoid nightly damage from the storms. They let the forest eliminate the extractivist intruders. All beings are iterations of the forest and those who come to take without participating in the larger cycles are treated as invading diseases needing to be eradicated. Knowledge of existing *within* the forest allows them to win.

This victorious ending shared by the Indigenous, the huge green furcots and the forest looks much like the victories at the end of both Le Guin's *Word for World is Forest* and Cameron's *Avatar*. What I want to emphasise here, however, is the focus on the forest-human collaboration as life-giving resonance that is not really so alien as it might seem. Much like Kimmerer's vision of reciprocity, Foster portrays a vibrant world of life and death in which survival and success occur only through collaboration.[3] Such reciprocity depends on an acknowledgment of forest care and agency voiced by the tree-created furcots. His novel clearly emphasises this vegetal voice, opening, in fact, with three relevant epigraphs. While the first epigraph is taken from Milton's *Paradise Lost* and describes the darkness of the forest: '… where highest woods impenetrable to star or sunlight, spread their umbrage broad', the next two epigraphs explicitly attribute agency and voice to the more-than-human. The first is from Thoreau: 'Who hears fishes when they scream?'; and the second quote is attributed to an actual earthly plant, *Calthea insignis*, commonly known as the 'rattlesnake plant', or a prayer plant, an exotic and popular house plant that originates in the rainforests of Brazil, living on the shady forest floor. It is quoted as saying: '……!!..??..O!!' (Foster 1975: third epigraph). In other words, Foster alerts the readers before the novel even begins to focus on the non-human voices and power.

The novel opens, indeed, with attention to the forest, not the human beings: 'World with no name. / Green it was. / Green and gravid' (Foster 1975: 1). The green world had a kind of sentience that gradually adapted to and then adapted with the arrival of human beings. 'The forest had

3 Foster returns to Midworld in the 1995 novel from his many-volumed 'Pip and Flinx' series, *Mid-Flinx*. This novel again features a cruelly rich extractivist who is finally defeated by the forest with the help of the heroic visiting Flinx, his mini-dragon, Pip, a lovely young widow and her two children and their furcots. We learn more about the vegetal intelligence as well as the glorious world-building details of the ecological nightmare that is the forest to the unprepared and uncooperating invaders.

strength and resilience and fecundity and variety. It was adding to its intelligence now, slowly, patiently, in the way of the plant' (Foster 1975: 212). The reciprocity between the trees and the humans appears also in the form of shelter embodied by the massive Home-tree:

> the Home-tree was a monstrously big tree for certain. Broad twisting branches and vines-of-own shot out in all direction. Air-trees and cubbles and lianas grew in and about the tree's own growth. Born noted with satisfaction that only plants which were innocuous or helpful to the Home-tree grew on it. His people kept the Home-tree well and, in turn, the Home-tree kept them (Foster 1975: 18).

The tree cares for them and they care for it by removing harmful growths and by supplementing its nutrients with their waste. Further protection comes from the vines surrounding their living area that are lined with pollen pods whose exploding dust can kill, and it also produces blossoms into which the residents spit, causing the barbed vines to pull away and create an opening to the living area. The tree recognises its own inhabitants chemically, and it creates a fitting living space for them.

> Here, the enormous trunk of the Home-tree split into a webbing of lesser boles, forming an interlocking net of wood around a central open space, before joining together high above to form once more a single tapering trunk that rose skyward for another sixty meters. With vines and plant fibers and animal skins the villagers had closed off sections of the interweaving trunklets to form homes and rooms impervious to the casual rain and wind. For food, the Home-tree offered cauliflorous fruits shaped like gourds, tasting like cranberry… (Foster 1975: 19).

The tree protects, feeds and houses the humans, and the human beings give it their waste and they work to keep their Home-tree free of parasites. Additionally, when huge armies of insects arrive to eat through the tree, Born, his people and the furcots join the fight to save the tree at the cost of many of their own lives. The people, the tree and the furcots are all aspects of the world's green resonance thriving with reciprocal care within one forest system.

Finally, the end of the novel returns to overt vegetal sentience: we witness the burial of a hunter along with his furcot in the giant trees. After having been fed by the trees for their entire lives, their bodies now return to being part of the trees. This burial and transformation means that they 'became something more, something greater. They became a part of the They-Who-Keep matrix-mind, which in turn was only a single lobe of the still greater forest-mind' (Foster 1975: 212).

In *Midworld*, we see overt green-resonance embodied by the trees, the mind of the forest, the furcot companions and the human beings who reciprocate care and so thrive. Foster makes visible what many extractivist cultures tend to ignore: we all depend on vegetal lives and exist within their vegetal resonances. The corporate exploiters in the novel, much like our extractivist corporate cultures today, seek a life-extending, profit-making elixir at all costs, including endangering the very vegetal resonances that enable the possibility of human life on both the planets of Midworld and Earth.

IV: MARCUS HAMMERSCHMITT'S *TARGET*

The 1998 German science fiction thriller by Marcus Hammerschmitt, *Target*, provides another vision of (alien) plant power but now transformed into horror. Unlike Le Guin's Athshe or Foster's *Midworld*, there is no cooperation between plants and humans but only predatory terror inspired by alien monster plants seeking to eradicate the invading humans in the manner of an immune system fighting disease. The novel takes place on a distant planet on which a huge crater exists, perhaps created by a meteorite. The crater lures visitors even though it is forbidden – dominated by a deep, ocean-like forest that is thriving precisely because there are no human beings there – and it is a dangerous place to visit. While the Earth's vegetal life has been fully destroyed and is now described as lifeless, cosmic explorers have seeded many other planets with earthly trees and vegetation. In their various wars with aliens, the humans have claimed the planet 'Target' as a site for nuclear testing, hitting it repeatedly with massive bombs and radiation. Not surprisingly, the forest might be reactive to human presence even though its site in the crater was supposedly kept as a reserve free from bombs (as if a reserve or park could avoid radiation): 'The forest is not being radiated, bombed, poisoned, burned. The forest is an ecological reserve.'[4] This forest, though, may have also arisen through chance: 'The wildest theory about the crater says that a meteorite hit Target, bringing the building blocks for the forest, and then the forest arose, grew, and blossomed. A second meteorite fell in the middle of the forest' creating the

4 Marcus Hammerschmidt, *Target* Kindle Edition, 1998, p. 140; all translations from the German are mine.

crater (Hammerschmitt 1998: 158). This mysterious forest-filled crater is like an ocean, as is noted by the narrator: 'It was as if we had dipped into an ocean …' (Hammerschmitt 1998: 170). And around them 'swim' fish-like creatures through the forest air: 'Below us lay a giant jungle, blue-green glimmering … I thought I saw movement among the leaves, silvery glittery sparks … Later I knew: hanging out over the forest I had seen stingrays …' for the first time (Hammerschmitt 1998: 164). The deep forest seemingly composed of many kinds of plants turns out to be a vast, interconnected and composite being into which, or into whose body, the humans dive.

The scientists in this dark tale of threatening vegetation, including the robot narrator, descend into the crater-filled forest-ocean as explorers. Very quickly, however, their diver transport is attacked by plant elements that cause it to lose power and crash to the bottom, killing one of them. They spend the rest of the novel trying to climb all the way back up and out of this plant-ocean, dying one by one by suicide, madness, or fatal wounds inflicted by plants. It is a difficult and futile battle to escape: 'We are alone on this planet, in this forest, that wants to kills us' (Hammerschmitt 1998: 883). Furthermore, the longer they wander through its depths, the more they realise that the forest is somehow sentient, 'The forest can sense your fear. It does something with it; it (he in German) develops a kind of animal out of your fear, if it/he wants. The forest is a computer, a life-machine, a biotechnical deity, a person, a something. It/he is a n-dimensional cellular automaton. The forest is a tree' (Hammerschmitt 1998: 1219). In the end, all the human beings succumb, the last one dying shortly after encountering an alien corpse. Finally, only the robot has survived and is left to tell his tale from atop the crater where he finally manages to arrive, alone, to wait for hundreds of years until his power generator fails. The visiting scientists are doomed when they encounter the forest's adversarial response to their incursion into its depths. No one comes to rescue them because they notified no one that they were descending into its forbidden green depths. Hammerschmitt, Foster and Le Guin depict human beings within the context of powerful vegetal beings, with Hammerschmitt turning plant power into a horror story with no possible reconciliation between plants and humans while Foster reveals green energy as both threatening and yet also the only hope. Le Guin adds in cross-cultural and cross-species communication as an idealised dream. The relevance of *Target* for this study

of plant worlds is that a vision of immersion within vegetal worlds is not always positive. The humans fail completely to survive and only their technological being, the narrator-robot, continues to explain the story, alone forever. Only our technology survives but in a sad, doomed form.

V. CONCLUSION: PLANT WORLDS

The three novels feature, in sum, forest worlds ranging from Le Guin's comfortable, protective home, to Foster's dangerous but sentient zones of green that preserve those who collaborate and destroy those who exploit, to Hammerschmitt's horror world where plants reject humans altogether. If Le Guin presents communication and collaboration (cross-cultural, cross-species) as a saving force, and Foster presents full-blown dependence on plants where knowledge and emotion connection of 'emfoling' are the only means of survival, Hammerschmitt presents the foolishness and destructiveness of human beings encountering an alien plant world with no means of success. Treating a planet as merely a nuclear testing site and treating a forest-filled crater as special while it exists within this radiated world presents a harsh critique of human beings who immerse themselves into a forest as if they were merely visitors and not a part of the system. Living in plant worlds is tricky, but not acknowledging our immersion within the green systems appears particularly problematic in these three science fiction texts. Stories of alien planets provide us with thought experiments for navigating both the obvious and startling connections to plant life that we actually have on Earth. A view from outside is helpful for rethinking our assumptions of control and returning to our own green-and oxygen-dominated world with a renewed understanding of where we actually exist: within the plant worlds.

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New German-language Nature Writing and the Language of Resonance and Reflection

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ABSTRACT

Nature writing is traditionally a genre of non-fictional, essayistic writing which combines vivid natural descriptions, profound introspection and ethical musings. Since 2000, the New Nature Writing (NNW) has emerged in Europe rejecting the escapist, heroic and sometimes nationalist conventions of the original American genre. This article analyses three examples from German New Nature Writing (NNW) from the early 2000s: *Laubwerk. Zur Poetik des Stadtbaums* ('The Poetics of the Urban Tree') by Marion Poschmann (2018), *Hafen von Greifswald* ('Port of Greifswald') by Judith Schalansky (2018), and *Wurzelstudien* ('Root Studies') by Anna Ospelt (2020). As with its British counterpart, German NNW is characterised by 'an attitude of mindfulness' (Goldstein 2018) and a poetic perception of nature, and is filled with 'protest energy' (Fischer 2019). Our paper will argue that, despite the very distinct approaches of the authors, these texts demonstrate an astonishing similarity in their quest for a 'language of resonance' between humans and the plant co-world and in their creation of new spaces of nature-cultural resonances

KEYWORDS

New Nature Writing, resonance catastrophe, language of resonance, mindfulness

New Nature Writing is sparked by the environmental crisis and seeks responses to it. While British NNW primarily discusses a 'recall of the wild' (Huggan 2016), the debates in German-speaking NNW focus on mindfulness and a new language of resonance with the aim of finding a poetic reflexive attitude towards nature in light of global environmental destruction. This essay starts with a brief overview of this new genre in Britain and Germany and outlines their differences and similarities. We will then look at three recent texts by some prominent German-speaking female writers. These texts are connected by a common interest of the writers in the vegetal world. Through a close reading of their observations and descriptions of nature, we will delineate how the texts under examination serve as illuminating examples of German NNW which is characterised by a particular interest in finding a new

language of resonance for the relationship between the human and the plant world.

In response to the pervasive estrangement between humans and the natural world, sociologist Hartmut Rosa has introduced the concept of resonance (2016) as a distinct mode of engaging with the world. Resonance, according to Rosa, involves a reciprocal response where a subject is impacted by the world, perceives its otherness and uniqueness, and undergoes transformation through self-efficacy, a 'triad' of affectation, emotion and transformation (Rosa 2019: 19).[1] Rosa delineates three dimensions of resonance: the 'horizontal', which pertains to social relationships such as love and friendship; the 'diagonal' which encompasses relationships with the material world; and the 'vertical', characterised by a relationship with the world as an all-encompassing totality when the perceived counterpart extends beyond the individual. In the highest form of resonance, the world itself is said to be 'given a voice' (Rosa 2019: 20). For Rosa, resonance develops when body, mind, and the tangible world converge into a harmonious triad (2016: 291). Departing from the longstanding Cartesian subject-object dualism, the concept of resonance signifies a paradigm shift by offering a viable relational framework to describe relationships between humans and the world. This concept of 'resonance' as a reciprocal relationship in its three dimensions can be fruitfully adapted to plant studies.

I. NEW NATURE WRITING SINCE THE 2000s

In the American literary tradition, nature writing is defined as a 'form of the personal, reflective essay grounded in attentiveness to the natural world and an appreciation of science but also open to the spiritual meaning and intrinsic value of nature' (Armbruster and Wallace 2001: 2). According to Thomas Lyons' influential *Guide to America's Nature Writing*, the genre has been characterised by three main criteria since its inception with Henry David Thoreau: the inclusion of 'natural history information, personal responses to nature and philosophical interpretation of nature' (Lyons 2001: 20). The foundational characteristics have persisted through subsequent genre definitions, but have also undergone

1 All translations of the text by Hartmut Rosa are by the authors.

expansion and evolution in recent times. This evolution has been closely intertwined with the development of ecocriticism since the late 1980s, extending its influence beyond traditional boundaries. The expansion encompasses not only fictional genres (Slovic 2004: 888) but also other literary forms and media (Armbruster and Wallace 2001) as well as critical perspectives addressing questions of region, ethnicity and gender.

In the last two decades, the British literary landscape has seen a 'golden age' of New Nature Writing (NNW) (Macfarlane 2013: 166). Unlike its American counterpart, this 'renaissance in Britain' is not only fueled by a profound 'longing for wilderness and nature', but more importantly, has been profundly 'energised by [a] sense of menace and hazard' stemming from the climate crisis (Ibid.: 167). Writers of the contemporary wave of British NNW challenge the recurrent accusations of nostalgic and elitist escapism, as highlighted in the debate between Poole (2013) and Mabey (2013). They actively embrace ethnic minority voices, engage in reflections on the global climate crisis, and explore new ways of representing 'wilderness', encompassing not only untouched or rural landscape, but also urban places and post-industrial wastelands (Macfarlane 2015, Stenning 2015: 2). Against a backdrop of alienation, personal loss and depression, particularly underscored by Richard Mabey (e.g. 2005), there is a notable emphasis on the healing power of connecting with nature. Jos Smith's extensive exploration of New Nature writing highlights how authors such as Macfarlane, Mabey, Tim Robinson and Alice Oswald introduce a dynamic sense of place that stands in contrast to homogenised urban cultures. In their depiction of landscapes, islands or suburban wastelands, these writers offer a counterpoint to the alienation often associated with modern life, all while diverging from 'nationalist conventions' (Smith 2017: 206) prevalent in the nineteenth century's genre tradition in North America. Jason Cowley, in the preface to a thematic issue of the journal *Granta* on NNW (2008), underscores the experimental character of the genre and its different relationship with the environment: 'They are about the discovery of exoticism in the familiar, the extraordinary in the ordinary' (Cowley 2008: 9, 11). The exploration of the extraordinary extends beyond secluded natural settings to include cities, their outskirts and industrial sites (Lilley 2017). NNW, thus, reveals an expansive understanding of nature, encouraging a rediscovery of the extraordinary within both natural and urban landscapes.

In the debate on NNW, the consideration of genre and form assumes a prominent role. In contrast to the earlier tendency to narrowly define the genre as non-fictional essayistic writing, British NNW actively seeks fresh literary and aesthetic responses to environmental degradation (Lilley 2017). This approach encompasses a diverse array of forms, including fictional genres such as novels and poetry. Described as 'passionate, pluriform and essential' (Macfarlane 2015: 6), NNW is characterised by 'originality and playfulness with form' (Stenning 2015: 5, Cowley 2008: 10). Despite this considerable expansion of the genre's scope, the majority of current NNW literature remains rooted in non- or semi-fictional texts. Autobiographies, travelogues, natural histories, and popular science essays continue to form the core of NNW expression (Stenning 2017). Nonetheless, this dynamic interplay between various literary forms underscores the genre's adaptability and its commitment to exploring diverse avenues in addressing environmental concerns.

In the face of the challenges posed by the Anthropocene, the traditional concept of nature undergoes a transformation, yielding to an often dystopian portrayal of a devastated landscape and a technologically altered environment. Within this context, the question of preserving of what remains in the natural world and establishing environmental justice comes to the forefront. It is important to note that this is not an unique phenomenon of the British literature; it is equally evident in the German-language nature writing, as will be explored in this article. The shared concern for conservation and environmental equity transcends cultural and linguistic boundaries, reflecting a global awareness of the urgent need for sustainable practice and ethical considerations in the Anthropocene era.

II. NEW NATURE WRITING IN GERMAN-LANGUAGE LITERATURE

The discussion on British NNW has found resonance in the German literary landscape, where nature writing has played only a modest role in the last 200 years (Goodbody 1998: 13, Fischer 2019: 33).[2]

2 See also the debate on the possible reasons why a comparable tradition of nature writing has not developed in Germany in the twentieth century, because of 'the burdened legacy' (Goodbody 2015: 124; Heise 2017: 3) of 'National Socialism with

Nevertheless, a deeper, albeit concealed, tradition with transnational influences, stretching from figures like Linné, Gilbert White and Thoreau back to Goethe and Alexander von Humboldt, and continuing to the present, can be excavated (Dürbeck and Kanz 2020). The impetus for a new nature writing movement emerged notably from the publishing house Verlagsgesellschaft Matthes & Seitz Berlin, which launched the *Naturkunden* series in 2013. Edited by the writer and book designer Judith Schalansky, this series is characterised by bibliophile design and rich illustrations.[3] In 2017, Matthes & Seitz Berlin, in collaboration with the Federal Agency for Nature Conservation, inaugurated the 'German Prize for Nature Writing', an annual accolade. The surge of interest in German-language nature writing also found expression in several literary festivals in 2018, seen as 'a part as well a mirror of the book market' (Schröder 2020: 317). Significant contributions to this burgeoning field come from Jürgen Goldstein (2018, 2019), Simone Schröder (2018, 2019) and Ludwig Fischer (2019). Their articles and monographs trace the roots of German nature writing back to Goethe and Alexander von Humboldt, establishing connections with modern figures like Ernst Jünger, Peter Handke, W.G. Sebald, Werner Herzog and others. This exploration demonstrates a growing interest in nature writing within the German literary sphere and its evolving dialogue with transnational traditions.

The aesthetic openness and ecological contemplation inherent in the NNW align well with the diverse forms of nature writing found in contemporary German-language literature. According to Schröder, nature essays are 'determined by a descriptive, introspective and reflective dimension' where 'scientific, subjective-emotional and ethical contents are linked' (2018: 344). Broadening the definition of contemporary German-language nature writing, Goldstein (2018) refers to it as a 'language-guided school of mindfulness for the discovery of the visible, but overlooked' (104). He emphasises the 'perception-shaping function' of language (Goldstein 2019: 27) and laments a widespread 'resonance catastrophe' of our society. He identifies nature writing as a means 'to

its blood-and-soil ideology contaminated the linguistic matrix for writing about the relationship between humans and nature' (Malkmus 2020: 18).

3 The series, comprising more than 100 volumes in 2023, has the intention to make the genre of nature writing in German-speaking countries known.

counterpose a sensitivity toward natural phenomena against the threatening silencing of the world' and to 'enhance our ability to resonate with our natural surroundings' (Goldstein 2018: 108). Similarly, for Bernhard Malkmus (2020), writing about nature signifies a new 'language of resonance' (21), characterised by the 'ability to let nature write itself via human language as a medium' (25). Nature writing, in this context, is a 'language-political project' (Ibid.). Fischer (2019) delves into the concept of the 'natural co-environment' ('Mitwelt': 112), asserting that, from Thoreau to Mabey, it has always been filled with a certain 'protest energy' (59) and 'counter-stories' (171), thereby addressing a fundamental ethical dimension.

In addition to the language of resonance and the protest energy, German-language nature writing exhibits further distinct features such as an 'authentic' experience with an 'autobiographical trait' (Fischer 2019: 45) and a focus on 'high literary-aesthetic demands' that transcends the non-fictional tradition (46, 180). Goldstein (2018) also emphasises the longstanding German tradition of nature poetry. In addition, he highlights the 'diagnostic and therapeutic potential' of nature writing 'in the tension field of of modernity' (Goldstein 2019: 13). While the concept of an 'attitude of mindfulness' (Goldstein 2018: 104) centres on individual subjectivity, writers like Ulrike Draesner (2018)[4] and Judith Schalansky argue for the importance of the writer's withdrawal from their own ego as a vital condition of nature writing. The poetic endeavour, articulated by Schalansky in a 2018 literary-festival discussion, is not 'to write … about oneself but of what one sees' (Schröder 2020: 331), which aligns with Gilbert White's approach of humility in nature writing and the genre's long empiric tradition. On the other hand, she concedes, as with other contemporary writers, 'that there is no untouched nature but cultural landscape' (Ibid.). Consequently, nature writing entails not only attentiveness to nature's changes and degradations, but also connects a critical dimension to the genre (Kanz 2020: 58).

In summary, German-language nature writing is characterised by (a) functioning as a 'school of mindfulness', engaging in precise, knowledge-based description of natural phenomena (descriptive dimension);

4 For Draesner (2018), 'Natur-Schreiben' is a 'writing in accord with nature' which is linguistically constructed and alters the signs of mimesis while giving 'the ego relief from itself' (165).

(b) establishing a language of resonance to rekindle an aesthetic connection with nature (aesthetic dimension); (c) fostering an awareness of both culturally shaped landscape as well as of planetary environmental destruction (critical dimension); and (d) embodying an ethically reflected attitude (ethical dimension).

III. ON REPRESENTATIVE EXAMPLES OF GERMAN-SPEAKING NATURE WRITING

Surveying the new current of nature writing, a notable trend emerges – a new generation, highly aware of the estrangement from nature and the pervasive environmental destruction, is actively seeking (re-)connection to the natural world under precarious conditions (Tsing 2015). Contemporary authors, driven by this awareness, engage in the creation of a poetic perception of nature and in the exploration of a resonate language, often experimenting with innovative literary forms. In a genre historically dominated by male voices, this essay analyses three texts by contemporary female authors who have contributed significantly to the evolving tradition of nature writing in Germany: Marion Poschmann's 'Laubwerk. Zur Poetik des Stadtbaums' ('Laubwerk. On the Poetics of the Urban Tree'), a speech she gave upon receiving the inaugural German Prize for Nature Writing; Judith Schalansky's 2018 essay 'Hafen von Greifswald' ('Harbour of Greiswald'), featured in her acclaimed anthology *Verzeichnis einiger Verluste* (*List of Some Losses*); and Anna Ospelt's *Wurzelstudien* (*Root Studies*) from 2020, a hybrid essay complemented by images and video-stills, created with the support of a Nature Writing fellowship. To ensure comparability, we analyse these texts around four common themes which play pivotal roles in each work: (1) nature observation and natural-cultural interrelations; (2) poetic perception of nature; (3) variations of a language of resonance; and finally (4) the ethical dimension.

The three authors employ distinct methods to establish a resonant connection with botanical nature: Poschmann adopts the technique of a 'deep mapping', involving meticulous observation of specific natural phenomena – in her essay, the autumn leaves' changing hues – during a specific time frame. Through the detailed analysis of the deep structure, she asserts that it 'reveals the greatness of the world' (Poschmann 2018:

118). In Schalansky's essay, the focus is on tracing the origin of the river Ryck in her hometown of Greifswald. Walking its course three times over a period of several weeks in the melancholic northern German spring, she carefully records her observations and reflects on her naming practice of flora and fauna as a form of witnessing nature before species face extinction. Ospelt's *Wurzelstudien* entails a personal exploration of her own roots, leading her to connect with trees, leaves, roots and rhizomes. This journey shapes her methods of observation and writing as she intertwines her search for identity with the natural world. The three essays use different forms to find and create a resonance between the human subject and the surrounding vegetal world.

(1) Nature observation and natural-cultural interrelations

The three selected texts share a common starting point which is the recognition that our understanding of nature is inherently shaped by our cultural perspectives. Poschmann's exploration of the urban trees in Berlin, as she conducts an intensive foliage survey known as 'Laubschau' (leaf watching) emphasises the multifaceted nature of trees. She contends that a tree 'can be perceived not only as an aesthetic marvel, but also as a manifestation of the historical, political, geographical, and ecological conditions of its location' (Poschmann 2018: 117). Poschmann highlights the historical significance of trees lining old trade routes and draws attention to the meaning embedded in street names such as 'Chestnut Avenue' or 'Under the Linden', which reveal the name of the trees initially planted in these locations (118). Cities maintain a tree cadastre. Urban forestry offices are actively engaging in planting 'climate trees' (120), a term 'registered as a trademark' (Ibid.), as they are believed to withstand the challenges posed by the climate crisis. However, she underscores that the threats faced by urban trees are not just from the climate crisis, but also from co-habiting with humans: deicing salt, dog urine, construction work and soil sealing (121) contribute to the endangerment of urban trees. In Poschmann's perspective, the urban tree serves as a symbol of the city's 'wilderness' (129). Engaging in foliage-watching inspired by the Japanese tradition of *momijigari* (the admiration of the maple turning red), she explores how the transformation of trees, particularly their changing colours, provides a unique avenue for people to re-connect with the vegetal world. This experience, she argues, allows individuals to perceive nature through a different

lense, fostering an awareness of natural phenomena, and opens our mind for a relationship of resonance with the natural world. (115).

In recounting her journey through the forest and suburbs to the port of Greifswald, Schalansky paints a stark picture where pollution and sombre hues dominate, revealing a deeply disturbed and degraded landscape. The autofictional narrator meticulously details the rich variety of flora and fauna in the Greifswald surroundings, juxtaposing it with the harsh reality of pollution from litter, toxins and slurry. The narrative weaves a melancholic atmosphere through the portrayal of the pale light characteristic of the northern German spring, the persistently cool weather, and the 'relentless east wind' (Schalansky 2018: 176). Unlike Poschmann, who was able to find aesthetically pleasing foliage with bright hues, the narrator in Schalansky's text could find no untouched woodland, but only culturally and technically transformed landscape. The journey through the woods is impeded not only by the boggy terrain and 'blistering black mud' (185) but also by clay roads marred by tractor tracks (177), electrified fences (183), barriers and deep clearances for power line constructions (185). The water was littered with 'liquor bottles of brands no longer distributed' (177), and the field soil took on a 'soapy' texture (175). The deleterious effects of pesticides manifest in 'discolored hydrogen blond' edges of the rape leaves (Ibid.), while the pervasive scent of 'slurry hangs in the air' (180). Amid this, 'a sprayer douses a barley field' (185). This form of Nature Writing, characterised by an acute awareness of the landscape marred by the ravages of civilisation, can be aptly termed 'critical nature writing' (Kanz 2021). Despite the harsh realities described in the text the narrator doesn't shy away from acknowledging the melancholic beauty of the landscape, portraying it through a color palette that includes words such as 'pale', 'leaden', 'streaky' (175), 'greenish drab' (181), 'rusty' (174, 179), 'algae-black' (175). This melancholy, stemming from acute awareness of what vegetal nature had to endure through our civilisation, contributes to the distinctive tune of the narrative.

Schalansky's approach to mapping the landscape is characterised by empathy, yet it remains steadfastly unsentimental. She employs precision and knowledge in her descriptions of the landscape the narrator traversed. Throughout her sixteen-page essay, nearly every sentence introduces a species of mammal, bird, insect, tree, plant, fungus, lichen or moss, surpassing 150 instances. From the pond mussel to the common

toad, from the blackcap to the azure damselfly, and from the plague and swallowwort to sour grass and star moss to orchid and golden lilac – Schalansky's naming practice serves a purpose: to document and preserve before these life forms fade into obscurity. In aligning with Annie Dillard's perspective, Schalansky implores a nature writer 'to be a witness',[5] a sentiment echoed in the forthcoming anthology she is editing, titled *To Be a Witness*, focusing on classics of nature writing not just as an art form but as a crucial medium for documenting and bearing witness to the existence of the natural world.[6]

Anna Ospelt's *Root Studies* has a comparable descriptive depth as the autofictional narrator employs a analytical method to observe trees, leaves, flowers, roots and various plant parts, often subjecting them to dissection and microscopic examination in the manner of a nineteenth-century naturalist. At the same time, Ospelt weaves her nature observations with genealogical reconstruction and reflection on her own writing process together. Her text is organised in four folders. The first folder contains the life story and some poems from publisher and writer Henry Goverts, a former owner of the family home. The autofictional narrator uses a withered leaf from the aging hanging beech tree named 'Henry Goverts' (Ospelt 2020: 15) from her parents' garden as both a lens for focused observation and a filter for a distinctive way of seeing. The second folder narrates the story of her grandfather, who, along with his brother from the local tannery, had planted an oak tree. The autofictional narrator not only learns about the various products derived from the oak, but also reveals a 'technological pedigree of the leather industry' (67). She contrasts its hierarchical structure with her own metamorphic peeling process, drawing parallels to a lily bulb. The third folder, titled 'Rhizome', compiles 61 'connections' depicting resonating experiences with roots, bulbs, leaves, trees and a developed herbarium revealing a 'root-rhizome network' (116). The last folder presents a text sample, possibly the first chapter of a novel featuring a protagonist named Ivy Blum, establishing a kind of rhizomatic human-plant relationship as a central theme. Ospelt's text weaves together intricate relations between

5 Schalansky at the Festival *Eventi Litterari*, Monte Veritá, 30 March–2 April 2023: https://www.matthes-seitz-berlin.de/autor/judith-schalansky.html (1:31:00).

6 Judith Schalansky (ed.). Wir sind hier, um Zeuge zu sein. Ein Lesebuch. Berlin: https://www.matthes-seitz-berlin.de/buch/wir-sind-hier-um-zeuge-zu-sein.html?lid=1

writing, roots and leaves, uniting botany and literature. The author is particularly intrigued by linguistic-metaphoric similarities, affinities, and interrelationships between vegetal nature and culture, playfully experimenting with these connections.

(2) Poetic perception of nature

A central theme in Poschmann's essay involves a profound reflection on language, particularly in her admission of attempting 'for years to write a tree' (Poschmann 2018: 123) in its tree-like essence – an endeavour to capture its 'sensual, unique, and atmospherically dense' nature (Ibid.). However, she acknowledges encountering a 'fundamental problem' inherent in nature writing: the 'unbridgeable hiatus between language and world' (123, 125). To address this challenge, Poschmann draws upon various perspectives. Firstly, she turns to the Japanese poet Matsuo Bashō, emphasising the importance of establishing a 'connection to nature' with the ultimate aim of 'becoming one with nature' (128). Poschmann describes how, in Japanese aesthetics, entities emerge from the 'void, from the infinite', seeking to 'convey a feeling of the indescribable' through words (130), which she portrays as a 'spiritual force' (130). Secondly, referencing the American nature writer John Muir, Poschmann emphasises the significance of 'disinterested pleasure, devotion, and evocation' present in Muir's 'precise and affectionate description' (128) of California trees and mountains. Thirdly, she invokes Romantic poetry, suggesting that the depicted not only mirrors the subject but also possess a 'capacity for poetic cognition' (131–32). Writing a tree, for her, entails the integration of these diverse dimensions. She contemplates that the 'perception that really touches us when we perceive a tree in its autumn dress ... is rooted in an empathy with that spiritual aspect of nature' (132), where 'spiritual' denotes the infinite or atmospheric.[7] She further notes that a tree resonates with us 'because it is so close to us, so fundamentally similar, so beautiful in its uniqueness' (132). Derived from a Romantic tradition, Poschmann views the task of nature writing as a 'new romanticisation of the world, a poetic

7 Helga Braunbeck (2023) analyses Poschmann's 'poetic taxonomy', in her poetic lectures, on writing as an 'animistic process' (12) as a form of 'phytographia' (13) in the sense of Patricia Viera as well as a 'co-creation' or 'sympoeisis' in the sense of Donna Haraway (Ibid.).

perception of nature' (125), yet she asserts that such romanticisation is without any 'sentimental transfiguration' (133). This nuanced approach highlights her commitment to portraying nature in its particularity, eschewing sentimental embellishments while capturing its inherent beauty and connection to the spiritual as a resonant relationship.

Similar to Poschmann, Ospelt is also deeply engaged in cultivating a poetic perception of nature in her *Root Studies*. Her exploration takes diverse forms, whether visiting Berlin's oldest tree, the oak affectionately named 'Dicke Marie' by the Humboldt brothers (Ospelt 2020: 91), or delving into microscopic examination of flower petals. Ospelt's conscious connection to nature unfolds as she creates herbariums or collects weathered leaves to use them as a lens to observe the world. Throughout her *Root Studies*, Ospelt seamlessly integrates her own photos and video stills – in which she often places herself in the picture – into the narrative. This approach draws attention to the media perspective and serves as a distinct feature of her work. For instance, she juxtaposes a picture of the inside of a wrist, presumably her own, with a beech leaf, both traversed by veins in a violet hue, albeit with distinct materiality, texture, and color.[8] While both images exhibit lines and veins, the deliberate arrangement aims to find a comparative perspective that acknowledges their differences while emphasising maximum similarity. This juxtaposition of seemingly disparate elements – a tree leaf and a section of a human body – strives to reveal a shared essence without masking their inherent distinctions. Notably, these visual elements correspond with the text on the opposite page, reinforcing the integration of multiple perspectives in Ospelt's exploration of the nature-culture connection:

> CONNEXION
>
> I do not wish to become a tree. I wish to want to become a tree.
> I would therefore like to become a tree poetically ...
>
> CONNEXION
>
> However, wanting to become a tree already has a transformative effect on me.
> (Ibid.: 108)[9]

8 For a more detailed analysis of the text-image relation, see Dürbeck (2023).

9 German text: 'KONNEXION / Ich möchte kein Baum werden. Ich möchte ein Baum werden wollen. / Ich möchte daher poetisch ein Baum werden wollen […].

The conclusion, 'I would therefore like to become a tree poetically', reflects an acknowledgement of the impossibility of an ontological transition between two distinct modes of being. Nevertheless, Ospelt skillfully establishes the poetic imagination as a method capable of bridging this existential gap and create a diagonal resonance in Rosa's sense. Despite the inherent dissimilarity and differences captured in the images of the wrist and the leaf, the text employs poetic imagination to construct a link between the two entities. This quote also serves as a representative example of Ospelt's narrative approach – a rhizome-like continuation. Drawing inspiration from Wolfgang Hensel's work *Plants in Action* (1993), where he notes that '[r]hizomes grow at their tip and die at their end. This is how they slowly creep through the soil' (96), Ospelt contemplates the writing process as a gradual growth, where all components remain interconnected. In other words, the 61 aphoristic-like 'connections' in the chapter 'Rhizomes', exploring various observations and experiences with leaves, roots, bulbs etc., from a vibrant network of ideas that grows from knot to knot and intertwines human and vegetal nature little by little poetically, akin to the slow, creeping growth of rhizomes. Affected by roots as well by rhizomes, the text unfolds two different resonating dynamics, in a diagonal as well as in a transformative dimension in Rosa's sense.

(3) Language of resonance

All three texts discussed here grapple with distinct modes of resonance as defined by Rosa. Poschmann delves into moments of resonance as she reflects on the descent of autumn leaves which she catches. Her poetic perception of nature, demanding 'a refined gift of observation' (Poschmann 2018: 130), encompasses all three dimensions of resonance, the horizontal (empathy), the diagonal (materiality) and the vertical, as the connection with leaves and trees approaches the aforementioned 'spiritual aspect of nature' (132). These resonant experiences are also expressed through her deliberate linguistic choices: 'the falling leaves, carried by layers of air, engage in a dance of verbs – swaying, spinning, drifting, tumbling, overturning and then floating again'. By choosing these verbs to describe the falling leaves, Poschmann gives them agency

// KONNEXION /Allerdings hat bereits das Baumwerdenwollen eine transformative Wirkung auf mich' . (O 108)

and reminds her reader of the activities of the vegetal nature, as she terms them, 'leafy activities'. This linguistic approach effectively bridges the previously lamented 'hiatus between language and the world'. Of particular importance is her neologism 'Laubverben' (verbs of leaves). Drawing from Robin Wall Kimmerer's 'Grammar of Animacy' in her book *Sweetgrass* (2013), which analyses the language of the Native American Potawatomis, a prevalence of verbs corresponds to the concept of an animated, effective nature. By describing falling leaves with an animated language of movements, Poschmann emphasises the enchantment inherent in this unruly natural phenomenon of falling leaves.

A different form of resonant relationship can be seen in a scene in Schalansky's essay, where she hears the 'bright voice of the bullfinch' and responds to its 'cheerful, monosyllabic call' (Schalansky 2018, 182). Describing the bird's reluctance to emerge from its shelter unless she reclines amidst the grass 'in the half-shade of pine trees' and it can perch 'directly above [her]' (Ibid.), she illustrates a heightened resonance within this sitting. Within this enclave, a profound resonance unfolds on a horizontal plane. Schlansky recounts, 'Its breast glows vermilion. I respond in kind, and the exchange continues for a while until it unexpectedly launches into a lively, previously unheard song comprising five verses that elude my attempts at imitation' (Ibid.). This encounter, transformative for the otherwise reserved author, articulates a fleeting yet profound moment of joy and intimacy. As she closes her eyes, an afterimage of 'the tangle of branches appears once again on her red blazing eyelids' (183).

Rosa describes resonance as a phenomenon of 'sounding back' that materialises when 'two sides or entities enter into a relationship' characterised by the distinct articulation of each participant's '*own voice*' (Rosa 2019: 21). Additionally, he elucidates that resonance 'inevitably and irrevocably presupposes *difference*', acting as a counterforce to one-sided appropriation, and its realisation comes at the cost of undergoing personal transformation (21–22). As a result, 'alienation' emerges as a 'complementary counter-concept' (16) to the dynamics of resonance. Rosa intricately ties the concept of resonance to the aspiration of forging an alternative to the prevailing paradigm of '*ruling and disposing*' (30), emphasising its ethical and political implications.

Against this backdrop, the two instances of resonance with non-human entities depicted in the nature writing of Poschmann and

Schalansky can be viewed as a means of reclaiming a severed connection with nature through literature. Importantly, this isn't a simplistic, nostalgic 'return to nature', but a transient experience amid the poignant acknowledgement of the continual environmental degradation inherent in late modernity. Nevertheless, a receptiveness to nature can seize those enchanting moments, offering a brief but impactful reminder of the possibility of resonance.

Similarly, the first-person narrator in Ospelt's text captures moments of resonance with the plant world, crafting a language replete with neologisms. For instance, she metaphorically details her metamorphosis through dance, coining an untranslatable neologism: 'Ich lilienzwieble mich' (Ospelt 2020: 75). Derived from the noun 'lily', this action verb not only maintains a botanical essence but also accentuates the dynamic nature of transformation. In another passage, the text portrays a parallel resonant relationship between the first-person narrator and a Japanese fan maple in her parents' garden: 'I stroke the branches. The leaves tingle, they tickle each other. The frosty leaves that I plucked off, they curl' (88). When expressions such as 'züngeln sich' (to flicker its tongue), 'sich kitzeln' (to tickle itself) or 'sich krausen' (to curl up) are employed in the reflexive mode, the activities seem intrinsically motivated. Assuming an agency within the plant world, Ospelt forges a language of resonance between the two entities – human and plant – endeavouring to linguistically mirror the agency of plants, consequently enriching language creativity.

In conclusion, all three texts underscore the significance of empathetic observation of natural phenomena and the resonating, creative use of language. Deep mapping or closely observing the ever-changing natural phenomena set in motion a blend of physical and poetic responses. The language of resonance unfolds diversely: in Poschmann's text, it manifests as a poetic contemplation of the agency of the plant, expressed through 'Laubverben' like 'trudeln, treiben, taumeln' (spinning, drifting, staggering); in Schalansky's essay, it emerges through an exchange of calls with the bullfinch in the uninhabitated woodlands, inspiring a multi-verse song that captivates the human listener; in Ospelt's *Root Studies*, it takes the form of neologisms and reflexive word constructions to capture the agency of plant, while the rhizome-like 'connections' in the text culminate in a fragment of a prose, progressively propel the text forward on a performative level. In this context, the connection with and immersion in nature leads to a self-induced

transformation, articulated through a distinct poetic language reflective of nature's agency. The relationship of resonance with the vegetal world forges novel connections that not only captivate the human observer but also reshape one's self-perception as resembling a lily-bulb or an ivy, thus offering an alternative to a utilitarian or dominating relationship with nature.

(4) The ethical dimension

As previously noted, German-language nature writing is marked by a distinct protest energy (Fischer 2019). This characteristic is evident in various forms in the three texts under examination. In the conclusion of her essay, Poschmann delineates the role of nature poetry not only as a means to evoke wonder and mystery but also to reveal the 'destructive power [of each individual]' (Poschmann 2018: 133). Asserting that a 'new romanticization of the world, a poetic perception of nature' is 'unavoidable if we want to prevent an ecological catastrophe' (Ibid.), she assigns a ethical or even political dimension to nature writing. In another essay on nature images and poetry, Poschmann (2016) contends that maintaining a seismographic attention and sensibility for upheavals [*Erschütterungen*] in the making constitutes a 'political act' (27). Her *Laubwerk*-essay illustrates how the lost connection to nature can be rekindled by embracing a new and romanticised perspective of the world (Poschmann 2018: 133). She further reminds us of our mortality and spiritual essence, framing our experience of the world as a transient moment, akin to a realm of ephemeral leaves that changes hues for a fleeting span: '[w]e are mortal, but we are also spiritual beings. The world is a dream, it appears to us as a world of fleeting leaves that change color for a few days. We must therefore treat it all the more carefully' (Ibid.). Consequently, she advocates for a more caring approach to the surrounding world. In essence, Poschmann recognises in nature writing the potential to acknowledge the vitality and vulnerability of the natural environment, using a poetic language to heighten our awareness and contribute to its preservation.

While Schalansky refrains from making normative statements about literature, she sees her writing as a witness testimony to the diverse facets of nature and its anthropogenic changes and destruction. Upon reaching the port of Greifswald, she intertwines the origin of

the town Greifswald and her own birth, looking at the hospital in the background. She concludes:

> Somewhere beyond, nestled in the Rosental valley between Ryck and Baberow, lies the salt springs, which, along with the river, would have been the reason why the forest was cleared and a market town was founded on the marshy terrain. In the brackish water a lifeless bream drifts … On a schooner's railing perch three barn swallows, their fox-red throats aglow in the evening sun. (Schalansky 2018: 188)

This confronting image intricately weaves together her own origin and the origin of the place. Human settlement, indicative of the birth of a civilisation, comes at the costs of subjugating nature and displacing habitats. The juxtaposition of the polluted harbor and the soothing evening light highlights the ambivalence of the present. Schalansky's essay is an illuminating example of 'critical nature writing' through its explicit acknowledgement of environmental damages and destruction brought about by civilisation. Nevertheless, amidst the destruction, traces of nature persist – exemplified by the presence of barn swallows. The role of writing is to document these aspects, serving as a reminder and a call to action: it is upon us readers to preserve the remnains of nature depicted in her words.

In Ospelt's *Root Studies*, there are dual conclusions. In the postscript, she first confronts the climate crisis, recounting how, amidst persistent heat, she not only tended to her parents' garden but also 'began to water the trees at the edge of the forest' (Ospelt 2020: 122). This reveals a caring approach to the plant world, forming the foundation of her writing. Secondly, she contemplates the transient nature of her text in the face of a potential environmental catastrophe: 'While reading the four folders, I kept falling asleep and dreamt of ~~burning~~ forests. I have to read the sheets again and lay them out again, in reverse order.' (122) Through her actions such as rereading the leaves in reverse order, Ospelt demonstrates her engagement with vegetal nature, a process inherently tied to the process of her writing. The creative endeavour unfolds in tandem with nature – whether it be the leaf through which she observes the world and connects with Goverts and her home, or the tree linking her with her family, or the roots, lily bulbs, and rhizomes which foster her transformation and facilitate her creative process. To discuss these ethical aspects of this chapter in the broader field of plant ethics (Kalhoff et al. 2018) demands another paper.

CONCLUSIONS

In summary, all three authors contemplate their writing in the context of the environmental crisis and experiment with novel ways of expression to (re)establish a resonating connection with the vegetal nature. Their essays engage with specific aspects of NNW and propel it forward in German-language literature with a poetic poise. This involves, firstly, a meticulous observation, refined perceptivness and precise identification of natural phenomena (descriptive dimension); secondly, a language infused with empathy and resonance (aesthetic dimension); thirdly, a connection to one's own person and their role as a witness (introspective dimension), emphasising a perspective grounded in humility and respect (ethical dimension); fourthly, a reflection on the function of language as a cultural archive (reflective dimension). Lastly, the portrayal of nature and landscape is rooted in a natural-cultural entanglement that concurrently documents civilisational and technical interventions into nature, along with their associated damages and losses, with the overarching goal of preserving what is left (ethical/political dimension).

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‘With/for Plants’: Resonances in Dance and Contemporary Performance (Ruth Geiersberger)

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ABSTRACT

This article examines the intricate interplay between humans and plants within the context of contemporary dialogues surrounding the climate crisis and the evolving dynamics of human and more-than-human relationships in the Anthropocene. With a particular focus on dance and performance, the article explores how networks of plants manifest in and influence artistic expressions. It scrutinises anthropocentric perspectives embedded in both scholarly discourses and artistic practices related to plant interactions. By delving into the nuanced variations in these relationships, as expressed through the use of prepositions such as 'about' plants, 'as' plants, 'with' plants and 'for' plants, the article aims to unveil how dance and performance have grappled with dismantling the hierarchical structures and colonising practices that often define the connections between humans and plants over the course of the twentieth century and up to the present day. The discussion extends to an analysis of whether there exists a potential for degrowth and an ethical alignment encapsulated in collaborative performances, exemplified by Ruth Geiersberger's 'For Plants' (2020). Additionally, the article explores the transformative potential of 'minor performances' in reshaping and decolonising hierarchical dynamics in the intricate tapestry of human-plant relationships. Through this examination, the article seeks to contribute to the ongoing discourse on fostering languages of resonance and envisioning a more harmonious coexistence in the face of environmental challenges.

KEYWORDS

dance and performance studies, critique of anthropocentrism, minor performances, politics of preposition, decolonising

uch has been said about the foundational premise informing my reflections on the topic of 'Networks of Plants and Language of Resonance'. This premise is intricately linked to the existential crisis faced by our planet, encompassing the wealth of knowledge that natural and cultural science research has produced within the Anthropocene. Given the profound entanglement of human activities with natural processes in this Anthropocene era, the longstanding dichotomy between nature and culture that has shaped Western thinking for centuries and contributed to the crisis of the Anthropocene, is no longer tenable. It is necessary to establish an

alternative conceptual framework for our intellectual and practical endeavours, one that acknowledges the interconnections between human activities and the natural world. The challenge we face is summed up in a sentence by the philosopher Günter Anders: 'Our actions extend further than our eyes can see' (as quoted in Scherer 2022: 3). 'The Anthropocene world is characterised by a surfeit of action that our understanding is struggling to keep up with' (Ibid.).

In 2022, the Berlin *Haus der Kulturen der Welt* [*House of the Cultures of the World*] showcased the exhibition 'Earth Indices', exploring the collaborative potential between the natural sciences and artists to work together to create models of transformations of our thinking and acting. The objective, according to the exhibition's programme, is to create a concerted effort to generate 'new evidences' and 'new imaginaries' in a 'time of transition, when traditional category systems no longer work' (Scherer 2022: 4). The prerequisite for this is the critical review and reassessment of traditions and norms of scaling – to redefine the standards of thinking and perceiving, of measuring and assessing through 'scale critique' (cf. Woods 2014; Clark 2010; Dürbeck and Hüpkes 2021). The point is – and the arts open up this possibility – to transform these scales, through a poetic 're-fabulation' (Haraway 2016: 213) of standards that have become obsolete. This would mean a fundamental change in our cognition and behaviour. Plants serve as the basis for this new way of thinking and behaving. In light of the imminent threat to biodiversity, plants have increasingly become the focus of attention, not only in scientific studies but also in artistic creations and exhibitions.

The Dresden Hygiene Museum held a major exhibition 'Of Plants and People' in 2019 (cf. Meyer and Weiss 2019). The themes, exhibits and artistic-curatorial framings make clear how much the history of the relationship between humans and plants has been and continues to be shaped by anthropocentrism. Even the interpretations of recent research on plant communication and intelligence often demonstrate unintentional anthropocentric attributions, which run counter to the intended discourse. Why is it difficult for us to perceive plants as a completely different but equal form of life? Why do we inadvertently objectify plants and perceive them predominantly in their relationship to us? (Jacobs 2020).

According to philosopher Emanuele Coccia, plant life is different because of plants' fundamentally different metabolism (Coccia 2019,

2016): plants possess the ability of autotrophy – they transform solar energy and heliotropic into matter and thus make 'matter, air, sunlight into what becomes for the other living beings, living space, even world' (Coccia 2019: 33). While all other life forms on the planet rely on building and sustain their existence through other life in their nutritional process, essentially engaging in a form of 'universal parasitism, even cannibalism', plants represent the 'only gap in the autoreferentiality of the living' (Coccia 2019: 32). By 'the photosynthesis of the plants it came to the massive oxygen content of our atmosphere': 'Thanks to the plants and their life, the higher animal organisms can produce the energy necessary for survival' (Coccia 2019: 34).

Everybody breathes! How do 'we' (a species that breathes) think, how do we act, how do we live when we are deprived of breath? 'Deprived of breath' is the title of Jean-Luc Nancy's final lecture, published posthumously in the cultural magazine *Lettre International* (Nancy 2022). The phrase 'I can't breathe!', which gained iconic status as a rallying cry against racial violence, originated in response to the tragic death of George Floyd in 2021, the same year Nancy passed away, symbolically deprived of breath. This powerful slogan encapsulates the interconnected issues of the climate crisis, the COVID pandemic, and racist violence. Referring to Walter Benjamin's writing *On the Concept of History*, Nancy states: 'Our history was not what we thought it was' (Nancy 2022: 8). We were shocked as we realise that 'We are deprived of breath, and this breathlessness finds nothing to say but this: Lessons will have to be learned from what had thus happened.' However, our outcry – according to Nancy – does not lead to the awareness of our own ignorance: 'But this imperative, which is hammered into us everywhere, hides the fact that we are totally ignorant about the future' (ibid.: 7).

The subject of this Special Issue, centred around the movements of resonances between humans and plants, underscores a profound concern: these movements of resonances unfold within a space whose very material existence is endangered. The atmosphere of our planet, a crucial component sustaining life, faces a threat with the perforation of its protective ozone layer. The very concept of 'air' (Horn and Bergthaller 2019) and the vital exchange of breath are imperiled. Thus, the foundation of (aerobic) life is threatened, along with the potential for resonance as a means of communication between different species.

The crisis of being deprived of breath, thematised by Coccia and Nancy, has several dimensions, which are intertwined: an ecological dimension (with regard to the exploitation of resources); a body-political and a legal dimension (with regard to the protection of intact life); an economic dimension (with regard to a capitalist and colonial ideology and neoliberal practice of growth and resource distribution). In addition, in terms of human life, there are the medical, social, psychological and cultural aspects of breath: vulnerability and transmissions. This has become abundantly clear during the COVID pandemic with all its political, medical and cultural interventions. One could conceptualise this as a 'Politics of Air' which encompasses the interplay of breath, resonances and porosity within the context of connections and ruptures between human bodies and their surroundings. This intriguing theme could be explored as a distinct topic in the context of eco-scenes and 'nature writing' in the Anthropocene.

The focus of my reflections in the following is on the resonances of plants and human bodies in dance performances and contemporary choreographic installations. Breathing is essential for dance, movement resonances in time and space: breathing is a resource of energy, of training practice and regeneration of dancers – and also, crucial for spectators in the shared space of the auditorium of a performance. Moreover, breathing is also increasingly deictically thematised and reflected on stage – i.e. breath becomes a shown, an audible factor – a sound of energetic exchange – in the works of contemporary dancers, as exemplified in the series of 'Verrichtungen' 'with/for plants' that Ruth Geiersberger performed in public places during the pandemic where the breath plays a vital role: for example, with the voice that Geiersberger gives the chosen plants; and in the songs that she sings.

The encounter and resonance between plants and dance as well as its inversion – the dance of plants – raises questions that could be explored, considered and illustrated from metaphorical and plant-physiological and phenomenological perspectives. My line of questioning is that of the relation/resonance of dancing and plants which involves two key considerations: it is essential to acknowledge that this perspective is inevitably shaped by humans. We all (with the exception of Ruth Geiersberger) talk 'of, about, by means of' etc. … plants.

Are we really talking about plants? Or are we discussing them symbolically, transferring meaning and significance to them? Do we speak

with plants? If so, how? Are we speaking on their behalf or acting in their place, perhaps through acts of preservation, rescue, care, or other resilience-related strategies? What I'm getting at is that the linguistical and grammatical ways in which we categorise or speak of literature and plants – plants in literature, literature about plants and so forth – inevitably reflects a hierarchical human agency.

When I say, for instance, dance and plants or dance with plants, a reflection on this phrase becomes necessary because it pertains a form of grammatical scaling. So, what would a critique of scale look like within this framework? A scaling in speaking cannot be avoided, but it can be subject to critical comment, which we may call the 'politics of resonances and prepositions'. Connecting this idea of preposition to my topic, we delve into the relation of dance and dancers and plants ('It's the little words that make up most of the language', Preiwuß 2019: 6). In the following, I'll explore the relationships and resonances between dance and plants through four key prepositions – *about, as*, *with*, *for* – in the context of a linguistic, hermeneutic scale critique. I shall begin with a brief overview, drawing on examples from dance history. Then we will move to a more comprehensive exploration, particularly in relation to Ruth Geiersbergers 'Acting with/for plants' [Verrichtungen mit/für Pflanzen].

'ABOUT' PLANTS

In scientific discourse, this preposition mostly means: 'researching about' a certain object, a fact, or a context. The preposition 'about' points to the constitution of the object (cf. Rheinberger 2005; Voigt, Beiersdorf and Müller-Tamm 2021) of our scientific research – be it natural scientific, be it cultural or artistic curiosity. Researching *about* plants, their origin, their distribution, their species already entails a taxonomic act. Inquiring *about* their manifestations in art and literature usually means a clear opposition and hierarchy of the researching subject and the object of investigation, depending on procedures, methods, instruments and discourse practices of the discipline. Furthermore, in this correlation, the term 'discipline' carries a rather concrete implication, encompassing activities such as translating, asserting and exercising the discourse power to classify, interpret and assign, even when reflecting and researching

within interrelated contexts or resonances, as seen, for example, in food chains. This distinction extends to the differentiation between utilitarian and ornamental plants, the methods of cultivation – or the symbolic attribution of meaning, as exemplified by the carnation in a buttonhole or the camellia adorning one's cleavage.

How does this notion of 'about' – as a means to articulate the relation between humans and plants – manifest itself in dance? For a long time this has been and continues to be associated predominantly with the western stage dance art, particularly evident in the concept of the role and purpose of plants, or more specifically, flowers as elements of decoration, such as the dancers' costumes and the ballet's décor in the 'Flower Waltz' in Petipa/Tchaikovsky's ballet 'The Nutcracker'; or the situating of a festival with traditional flower garlands in August Bournonville's 'Flower Festival in Genzano'; or a flower accessory with dramaturgical function – the flower basket in 'La Bayadere' (Petipa/Tschaikowsky), which holds the snake that kills the riva, and, last but not least, the opulent floral decorations every year at the Vienna Philharmonic Orchestra's New Year's Concert.

The relationship with plants as shown here is a clear demonstration of a relationship 'about' plants. We turn them into ornamental embellishments by using their blossoms to furnish a place, symbolise a social situation or elevate a celebration. The beauty of plants amplifies the grandeur of human self-celebration. However, the adornment (the ornat) is intricately linked with a sacrifice, for it entwines with the inevitable withering and dying of the plants. Even in this context of a relationship defined by 'about', one could still detect a resonance in the sign of the ephemeral. The ephemeral of a feast, of a dance and of the floral decoration allude symbolically to the mortality of the very individual who orchestrates this intricate relationship. Goethe expressed this in an epigram:

> Jupiter, why am I not everlasting? questioned beauty.
> Answered the God: I have made beauty to come and to go.
> Love was present, and flowers, and youth, and the dew, and they heard it.
> All left, weeping, the hall Jupiter's, weeping and fair.' (Goethe 1878: 319)

'AS' PLANTS

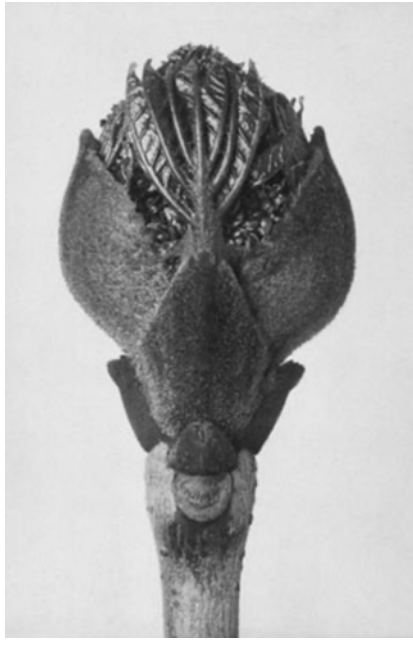
The preposition 'about' delineates a distinct hierarchical and colonising relationship between subject and object, humans and plants. However, when we examine the preposition 'as', we find a more nuanced interaction no longer confined in this binary structure. The linguistic preposition 'as a plant' points to a process, a movement a transformation. The 'as' is an indicator of becoming – that is, of the process of a metamorphosis. It is the wide field of the metaphorical. Even within a seemingly light-hearted jest, as in the awkward gallantry of 'the flower of the flower', the preposition 'as' emerges as a catalyst for transformation. It presents the notion of the woman being equated with a flower – an age-old, clichéd gender stereotype which serves to underscore a significant point. The relationship between humans and plants (as well as with all species) as signified by the preposition 'as' is one of transference, of the possibility to 'become different'. The myths as well as art and literature, such as Ovid's *Metamorphoses* and Otto Runge's paintings, show the myriad ways of a relationship defined by transformation, a relationship

FIGURES 1 AND 2.
Lily Dance, Gelatin silver prints, circa 1900 (Théodore Rivière, 1896).

between two equal subjects expressed through the preposition 'as'. How does such a relationship look in dance?

Within cults and rituals, the transformative power of 'as' is evident, signifying processes of appropriation, change and profund alteration, as seen in fertility rites. Though transformations involving animals are more common, in the history of Western artistic dance, the 'as' as a model of relationship and resonance between dancer and plant has emerged relatively late. A prototypical and model-forming performance of a dance as a plant was created around the turn of the century 1900 by the American dancer Loïe Fuller. She performed it in Europe in vaudeville and theatres – in Paris, Berlin, Vienna – and at the same time fundamentally changed the aesthetics of dance. One of her most important dances was titled: 'La danse du Lys [Lily Dance]'.

The photographs show what this 'as' means for the art of movement: the dancer appears as a plant. This transformative 'as' reveals itself through a concealment of the subject and their corporeality within the flowing silk fabric. What becomes visible is the dancer's body undergoing a remarkable metamorphosis, evolving into a dynamic, performative, plastic-mobile spatial sculpture, perpetually shaped by the fluidity of the silk formations. It is an artificial-artistic transformation of the dancer's body into a play of light and folds. The immense success of this dance by Loïe Fuller stands in a historical and aesthetic context that can be described as plant resonances, namely the epoch of Art Nouveau, or Art Deco. This period, known for its artistic, architectural, design- and fashion-related characteristics, was strongly influenced by a profound connection to the otherworldly beauty of botanical forms, the plant-like, the floral forms. One may call it the age of plant-heliotropic awakening in the sign of *spring*, the *spring of* a 'ver sacrum'. There has been sufficient study on the manifestations, the political, social, technical and economic ambivalences in connection with this 'as'. I would only point out the parallels and resonances of art with natural science/botany and a new way of seeing the vegetal world through the technique of photography, as seen in Ernst Haeckel's research 'Art Forms of Nature' (Breidbach and Eibl-Eibesfeldt 2004) and the photographs of Karl Blossfeldt (Mattenklott et al. 1997) which brilliantly reveal the intricate design, the material and phenomenal structure of plants. These images portray plants just as objects, but showcase their function as models, and in a sense, as instructive 'mentors' for architecture and technology.



FIGURES 3 AND 4.
Karl Blossfeldt: *Acer pensylvanicum* and *Fraxinus excelsior,* from 'Urformen der Kunst [Art Forms in Nature]', 1928. Public domain.

In the intersection of an epoch's signature, combining scientific, pictorial and philosophical-phenomenological perspectives, the 'as' in Loïe Fuller's 'Lily Dance' appears as a luminous depiction of an endless play of metamorphoses in which the dancer, the light and the flower grow, change, draw to each other and become one and different. Loïe Fuller's 'Lily Dance' breaks new ground in the history of dance. While other attempts by dancers like Niddy Impekoven remain caught in a childlike, playful, almost helplessly imitative gesture, Fuller succeeds in staging the transformation as such. The concept of 'becoming', specifically the process of becoming different, embodies a dance form of 'metaphora continua'. The dance does not reside solely in the comparative form of 'as', which often finds its culmination in the mimicry, in the guise of 'as

if'. Instead, it thrives in grace, a meta-physical transference and transformation, turning the materiality of body into fluid motion.

It was probably this fascination with a dance and a language of 'as', arising only from movement, that prompted Mallarmé to write his famous essay on Loïe Fuller. Needless to emphasise that this play of transformation, this movement of a 'towards', of 'becoming' a floral figuration, gave rise to a new aesthetic dimension of artistic dance. The Modern dance begins precisely here (see Eike Wittrock's reading of dance, plant movement, and media technology, 2016).

Let's continue to focus on the preposition 'as', but shift our observation to the end of the twentieth century. With the advent of modernity, the avant-garde and the concept of 'becoming', the relationship between humans and plants has been expressed as a process of metamorphosis which also influences plant existence such as metabolism and the conversion of solar energy into plant matter: the 'as', the *metaphora continua* of metamorphosis, loses its figurative essence within the figure itself. This transformation becomes clear in dance performances following the Second World War, for instance Pina Bausch's dance-theatre piece 'Nelken' ('Carnations'). This piece already bears a flower in its title, but it is no longer about 'becoming as' a flower. Instead, the figure of the flower is fractured in many ways – the images, metaphors, and symbolic contexts of the carnation intersect and collide – until they ultimately manifest as a form of resistance against the act of appropriation. Also, the stage is covered with artificial carnations. Traditionally, a sea of flowers alludes to happiness; but the summer meadow, where couples meet and ask for love, is riddled with irritations and disturbances. The field of flowers here suggests conflict scenarios and exposes the stage itself as a place of ambivalent and deceptive feelings. The contradictions between the social realm of unity, of resonances of emotional and bodily movement on the one hand, and the abrupt intrusion of violence on the other hand can no longer find their resolution in the 'as' – in the potential resonance with flowers. Ultimately, the field of carnations succumbs to destruction, trampled down by the feet of the dancers.

In the process of conveying the preposition 'as', a disruption of imagery occurs, a catachresis. It is a transformation that no longer presents the transfiguration of the dancer into a flower as a self-contained concept, as seen in the works of Loïe Fuller, but that highlights and reflects

the artificiality inherent in the interplay of nature and culture, or culture and nature in the context of human-plant relationships.

'WITH' PLANTS

The preposition 'with' signals participation, togetherness, co-existence, co-operation and also consensus – an interplay, and perhaps even equality, or at the very least, a flat hierarchy in the 'we'. Donna Haraway (2003) speaks of co-companionship between human and nonhuman species. The 'with' symbolises the utopia of 'syn -': the act of synchronising separate beings through movement and in sympathy. In the discourse and in diverse practices, workshops and cooperative projects of contemporary dance, 'with' – the 'co-' of complicity (Ziemer 2016) as well as compassion – plays a significant role. The emphasis on a dynamic relationality, an 'in relation', a 'being-with' of a 'singular-plural' – to borrow from Jean-Luc Nancy (2000) – and the expansion of networking and interweaving structures for the practice of dancing/moving together, all serve to broaden the concept of choreography into what is known as 'expanded choreography'. This expanded notion encompasses a different realm, one that also includes the relationship with plants, their growth, cultivation and even poaching. An example of this is the creation of a landscape/garden fragment on the grounds of the Tanzfabrik Berlin with a variety of plant species. Dancer and choreographer Jared Gradinger planted this area as 'The Impossible Forest' in 2016 as part of a collaborative project: 'with plants'. Over the time it underwent numerous changes and was allowed to evolve on its own. Today it has transformed into a mature green island within the passageway of the Uferstudios Berlin.

Gradinger aptly calls it a 'co-creation with nature' – a 'with' that is dedicated to the 'non-human and unseen'. This prompts the question: can this still be called dance? In what way does a social choreography, akin to what Joseph Beuys referred to as a 'social sculpture', and a novel concept of the choreography centered on resonance and movement manifest itself within this unique collaboration between plants and humans? Within this 'with' that binds the two species, an exceptionally gradual process unfolds, spanning years and encompassing the entire lifecycle from growth to withering to wild growth. This protracted dance

demands a distinctive perspective, one that involves different materiality and ecological awareness, not to mention a novel sense of temporality. It unveils an alternative scale and an entirely fresh way of scaling relationships. All of this operates subtly, involving all those who happen to linger, pass through and take part as participants.

Gradinger's situational choreographic composition creates a 'with' that suspends the boundaries between dancers and non-dancers, between art and nature. The political dimension of this 'with-plant' work embodies a *longue-durée* perspective. It doesn't take the form of traditional manifesto, but rather exists in the background, beyond the stage's spotlight. It operates in the realm of the unspectacular, the everyday-public. It sees itself as a confrontation and appeal to urgent ecological questions. However, it does so through the means of a choreographic transmission, setting it apart from those activist pamphlets that promote the rights of plants in urban space as an action of liberation: 'How to become an Eco-Guerillera. A guide to gardening disobedience (in 7 steps)' (Habermalz, n.d.). The appeal culminates in the call: 'Join the Eco-Underground!' with the 'revolutionary message' to be scattered, disseminated like seeds – 'Fight the Geraniums, Peace to the Weeds'.

'FOR' PLANTS

In yet another way from that of Gradinger with his 'Impossible Forest' in the grounds of Uferstudios Berlin performer Ruth Geiersberger works 'with' and 'for' plants. And this brings us once again to the shift of prepositions – from 'With' plants to 'For plants'! The 'for' actually indicates a change, a turn in the way of the relation (respectively the production and interpretation) of the relations. The participative 'with' already assumes a connectedness, a 'we' and thus a community. However, there is a nuanced power relationship associated with the preposition 'with' – the problematic of 'the sameness' and appropriation. This subtle power of 'with' is implied in the shift from 'with' to 'for'. The 'with' is unconditionally inclusive, without the need to address the realities of diversity: those who are not 'with' are often 'ex'/'cluded'. The problematic aspect of the trend towards the participatory, the 'together' in performance concepts and dance discourses, lies precisely here (cf. Esposito 2004; Eikels 2013; Marchart 2019). The preposition 'for', on the other hand, takes a step

FIGURE 5.
Ruth Geiersberger: *mit Pflanzen Phase IIa*, Bordeauxplatz Munich (GER), 2020.
Photography: Helge Classen, http://www.mitpflanzen.de, with thanks to the artist.

back, indicating 'for' as a movement 'towards', as a gesture of gift. The preposition 'for' does not pretend equality, like the participatory inclusion of 'with'. Rather, it acts in the sign of a diversity that must always first be agreed upon, perceived and respected in the encounter. The 'for' ... establishes a relationship that pays respect to the other, to the otherness of the other. It is precisely this change from 'with' to 'for' that characterises Ruth Geiersberger's multi-part project, developed over several years. Created in the spring of 2020, when the COVID pandemic had just begun, and corresponding hygiene and political measures of the lockdown were altering the private and public space of social encounters, Geiersberger developed the series of short performances, called 'Verrichtungen' with, later changed to 'Verrichtungen' *for* plants, thus creating a space of resonance for the plants.

She speaks of a complicity in the artistic collaboration of all those involved in the performances: musicians, performers, singers/dancers. They show scenes improvised with minimal setting, performed only once

FIGURE 6.
Ruth Geiersberger: *mit Pflanzen Phase IIa,* Bordeauxplatz Munich (GER), 2020.
Photography: Helge Classen. Source: http://www.mitpflanzen.de, with thanks to the artist.

and documented in video. These are small performances on Bordeaux Square in Munich/Haidhausen. Plants are the addressees! They are the audience and the witnesses of these performances. The city traffic, the passers-by, the urban movements appear peripherally; they belong to the ambience, appear as everyday incidental sounds (for example the streetcar). 'For plants'...: through this act of addressing, the plants cease to be mere objects, but become our counterpart – fundamentally different, simultaneously close and distant, familiar and unfamiliar.

The initial 'Verrichtungen' already elucidates the handling of the found plants in their natural environment. Geiersberger presents a serenade 'for' plants. Simultaneously, she 'moves' the plant, addressing it with 'for'; carefully placing it on a small cart, she relocates the plant, giving it a mobility and the ability to shift locations precisely in the context of immobility imposed by the COVID regulations. The freedom of

movement, which was extremely restricted for humans, was deliberately conferred on the plant.

'For plants': here unfolds a passage, a brief transit from one point to another – a gift of trans-position. In this act, a reciprocity is reflected, a dynamic that starkly contrasts with the immobility imposed on human populations during the pandemic, particularly for those living alone, seemingly sentenced to a standstill much like plants. It is precisely at this juncture that a playful moment emerges in the performance; a reciprocal resonance: a song and a change of place 'for' the forget-me-not – symbolic flower – echoing a Bavarian folk song as it gracefully shifts its position.

This 'For Plants' is not only a play on the preposition as a gift, or a resonant relationship between humans and plants – an expression of respect for the otherness of the 'plant' species, as outlined by Coccia, quoted at the beginning of my text. I would *also* interpret it as a constellation of ecological awareness and a stride towards de-colonisation. Why?

In her mini-performance 'For Plants' Geiersberger updates her concept of 'Verrichtungen' as a movement 'towards' the small, the inconspicuous, the being-there of plants. She consciously moves in the local and the regional context – in the space of neighbourhood. She treats plants as neighbours and companions, embracing their presence, particularly when she relocates them, takes them out of their usual territory, and sends them on new journeys. In this moment, the focus is not solely on plants as an abstract concept or the overarching theme of extinction. Instead, it shows the nuanced approach towards 'for', underscored by a profundity and strength in the seemingly ordinary moments. In a variation of Deleuze/Guattari's theses 'Toward a Minor Literature' (Deleuze and Guattari 1976), one might characterise the minoritarian as a movement found in the performance 'For Plants'. Geiersberger's plant performance embodies the characteristics of the minoritarian, specifically the 'deterritorialization and coupling of the individual to the immediately political' (Deleuze and Guattari 1976: 27), evident in its ever-new variations. Her performances unveil a play of metamorphosis that transcends a mere 'as if' appropriation or the act of becoming a plant. Instead, they establish a relationship that, echoing Deleuze/Guattari, 'embraces the greatest possible difference' (Ibid.: n32), communicated through a nuanced and almost Brechtian gesture of alienation. Certainly, there is a greater playfulness, an element

of improvisation inherent in the unexpected turns and the connections forged in the performance 'For Plants'. It is never about appropriation, but rather a rediscovery of the local context. The deterritorialisation achieved through the shift to dialect and the local language precisely aligns with the unfolding of power in the minoritarian – *moving away* from universal assertions of validity. This performance masterfully captures the essence of the minoritarian, as exemplified by Deleuze/Guattari in their analysis of Kafka's relationship to Yiddish: 'Living in one's own language like a stranger' (Ibid.: 38). Through the minoritarian lens of the performance 'For Plants', a performative dimension is unveiled that touches upon the broader questions of ecology and the climate crisis. The respectful engagement with the intricacies of the seemingly insignificant, the exploration of a (plant-)relationship through the gesture of the 'for' alludes to the position invoked by climate protectors and activists. It echoes their fervent call to curtail the relentless expansion movement of growth (Brand 2022) through methods such as dismantling, convivial techniques and embracing a post-growth of 'de-growth' (Vetter 2022).

Yet, the political essence within Geiersberger's 'Verrichtungen Für Pflanzen' is not a superficial representation of the scale critique, but resides rather in how it subtly conceals and reveals itself in the minoritarian. The poetic range of these performances, characterised by their displacements and transpositions, manifests as minoritarian, as a gift of care in micro-movements. And it is precisely in this – as Ecoscene – the performance avoids a demonstrative activist approach or a romantic-highlighting depiction. Instead, it delicately alludes to the threatened interweaving of a nature-culture shared by humans and plants in a common public space.

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Merve Ünsal

Into the Wind: Writing with a Fig Tree

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Merve Ünsal, *Into The Wind*, 2022. 21 minutes, audio installation with speakers. Installation view from Mardin Biennial (Turkey).
Sound file available at https://soundcloud.com/merve07/into-the-wind-1?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing

hile presenting *Into the Wind* at a climate emergency and gender conference in Gaziantep, Turkey in November 2023, I was approached by a woman who wanted me to return to the slide in which I had shown the *Into the Wind* installation: the image showed a fig tree in a semi-private courtyard. When I asked her why she wanted to look at this slide, she said it looked like home, referring to the home she left behind in Syria as a refugee. I realised once again that the fig tree, in the context of Western Asia, stands in for and articulates more than I could begin to recognise.

Into the Wind is a 21-minute audio recording of a performance, produced for the Mardin Biennial in 2022. Mardin is a city in southeastern corner of Turkey, bordering Syria and the biennial is situated in the historic part of the city on the side of a hill facing Syria. Many of the works in the biennial are dispersed across businesses and public sites, as it appears that the local community has embraced the biennial. Installed on a fig tree located in the courtyard of a ceramics studio, the work is physically situated so that the recording can be heard from the narrow street, while located within the fig tree, which is thus transformed into an instrument of transmission.

The fig tree holds many symbolic meanings in the mythology of Anatolia. The fig tree was engraved in my mind with this passage by Sema Kaygusuz, an author from Turkey, who brings in the image of the fig tree as she discusses her grandmother in the introduction to the book, *A Place on Your Face*:

> [My grandmother] had made me memorise that the fig tree in the garden was my sibling. Despite her overflowing narratives, she never mentioned the massacre that she witnessed in Dersim in 1937 and 1938 … She was feeling the deeply embedded guilt of surviving the hell that had killed and exiled thousands of people at a massacre that only took a few months to execute … I intended to write with the language of the fig, which I adapted from the fig tree … In other words, in this novel, I was a grandmother who survived a massacre, a granddaughter, a godsend, a fig with an infinite number of seeds. Actually, we all wrote each other.[1]

1 Sema Kaygusuz, *Yüzünde Bir Yer* (Istanbul: Metis Yayıncılık, 2015), translation my own.

Kaygusuz's connecting the fig tree, its mythologies, the massacre of Dersim[2] and the unspeakability of the massacre both in her own family history and elsewhere, proposes a method for entanglements and their utterance within the breadth of a few sentences and speaks to the necessarily intertwined temporalities of the now, the living, with all that has happened before. Kaygusuz proposes the method of writing each other through the fig: the fig is an inscription and a textuality with and through which we write each other. I would also highlight the urgency as we *must* write each other.

Kaygusuz's description of 'a fig with an infinite number of seeds' resonates within the specific context of Mardin for two reasons. Firstly, the city is an amalgam of cultures and languages, ranging from Assyrian to Kurdish to Arabic and the multiplicity embedded in the place produces an infinity through multiplicity. Second, the potential of reproduction could be expanded to refer to a call for action: the fig tree is a symbol of proliferation, of becoming many.

Into the Wind comprises five channels that are collapsed together and listened to as one. I performed the last layer while listening to the first four layers and this relatively improvised modality of recording is why I consider this work to be of a specific moment, a recording of a performance. The channels are given equal space in the work, but I will number them here to delineate the order in which they emerged in the process.

The first layer is a field recording that I made in 2019 in Wadi Rum (Jordan). While participating in a film workshop on the desert with a small group of artists, I found out that the Jordanian military had training sites close-by. Also a filming site for many space movies, the red desert seemed to host many temporalities and intentionalities, so I had the idea to make a recording of the space between two people. I asked a colleague to take a walk with me for twenty minutes. I asked her that we do not speak but rather walk together in this unfamiliar landscape. The full recording, which was 21 minutes, reflects the incredibly poignant experience of that walk and the intimacy that became palpable within a few minutes of the walk; the translation of physical space into the

2 Kazım Gündoğan, 'İdamının 80'inci yılında Seyit Rıza'nın ardından: Dersim Katliamı neden yapıldı?' *Gazete Duvar,* 16 Nov. 2017: https://www.gazeteduvar.com.tr/forum/2017/11/16/idaminin-80inci-yilinda-seyit-rizanin-ardindan-dersim-katliami-neden-yapildi

sound that was not distinguishable from any other field recording of the wind, was both futile and secretive. I situated this recording as the base layer of an experience that was launched with intentions of research and completed with an overwhelming sense of intimacy. This recording is why the work is 21 minutes long. I began the work with a duo performance and finished with a solo performance.

The second layer is made up of over forty recordings of voices of women speaking about and narrating resistance movements. The longest clip is a minute long and I specifically chose sentences and phrases that were ambiguous, selecting out any references to specific places or times. There is only one specific reference within the clips, which is to the May 1st celebrations of 1977 in Taksim Square (Istanbul, Turkey). This Labour Day is also called the 'Bloody May 1st' as shooters whose identities are still unknown shot into the crowd and 34 people were killed in the panic that ensued.[3] The women describing their experiences before the shooting highlight how May 1st is a state of mind that can never be ripped out of the psyches of the people, even if governments prohibit marches and celebrations.[4] This uttering by the group of women who were reminiscing about May 1st 1977, is the conceptual core of *Into the Wind*, as I appreciated and built on this sensibility of reclaiming a moment that ought to be marked by celebration, understanding that it was the ineffable power of a state of being together that had turned this celebration bloody. These women had situated the resistance and cooperation movements in a state of mind, rather than a place or a situation, which seemed to be the key to finding hope in our devastating times. The utterances that I collected from radio and television recordings range from the whimsical to the confused to the explanatory, composing statements from the fragments that I pulled together not through logic, but through the state of mind described. In other words, I located my artistic work within the now familial utterance of women across time and place, building narratives alinearly.

The third layer is a recording of a digital theremin. I used a digital theremin to translate a visual image into sound. The *New York Times*

3 '1 Mayıs İşçi Bayramı: 1977'deki 'Kanlı 1 Mayıs'ın tanığı kadınlar anlatıyor', *BBC News Türkçe*, 30 April 2019: https://www.bbc.com/turkce/haberler-turkiye-48113761

4 May 1st celebrations have been banned from Taksim since 2013: https://www.bbc.com/turkce/haberler-turkiye-61292303.

released footage of a drone strike in which the wrong person was killed, after intense surveillance by drones. In the footage, you can see the person as through the surveillance perspective.[5] I traced the movements of this person before their demise, recording the sounds made by this act of tracing on the digital theremin. To put it simply, my mouse followed the person, collapsing the space of surveillance seen through a screen with the axes of the digital theremin. The fourth layer is a collection of field recordings from around the world of the wind. I have been using the element of the wind in my work as a signifier of site and in this particular instance, it helped me collapse different sites together, while I was also thinking about the wind as a carrier of narratives, transmissions, an element of erosion, an overwhelming soundscape.

The fifth and final layer is a brief tale that I wrote, inspired by Anatolian legends and myths that narrate whispered words, trees, animals, the soil, the wind. The central motif of the tale is the fig tree as I subvert an idiom in Turkish. 'Planting a fig tree in one's home' means to uproot, to destroy the home. This idiom emerges from the fact that fig trees have very strong and widely expansive roots, which means that if one were to plant them too close to their home, the roots would eventually take over the foundation of the house. However, believing this strength to be a force of cooperation and entanglement, the fig tree in my tale is one of embrace, an embodiment of temporalities in parallel to Kaygusuz's fig tree. After having written the tale, I improvised while playing the other layers, speaking into my microphone based on the tale and some other notes that I had taken. I whispered the tale, thinking about whispering as a mode of operation. The tradition of family elders whispering the names of children into their ears as well as the intimacy of whispering into someone's ear as an extrapolation of a state of being together were on my mind as I realised this performance.

Installing the work on and around the fig tree in the courtyard of a ceramics studio furthered the ambiguity of the fig tree. While the roots of the tree were deeply embedded in the private courtyard of the ceramics studio, the branches provided shade to the narrow street on the other side of the wall. The fig tree's already-eavesdropping position, reaching

5 Christoph Koettl, Evan Hill, Matthieu Aikins, Eric Schmitt, Ainara Tiefenthäler and Drew Jordan, 'How a U.S. drone strike killed the wrong person', *New York Times,* 10 Sept. 2021, https://www.nytimes.com/video/world/asia/100000007963596/us-drone-attack-kabul-investigation.html

up and around the wall that separated the private and the public spaces, was accentuated by my one-month-long accompaniment as I would like to think that the fig tree and the audio became enmeshed, listening to each other while tuning into temporalities, spatialities, and writings here and elsewhere.

Merve Ünsal is an artist who lives and works in Istanbul and Santa Cruz. She works around methods of tuning in and is currently pursuing a Ph.D. at the University of California Santa Cruz , CA. She thinks through the media of photography, video, radio, sound, performance and site-specific installations. She has shown her work in a variety of contexts across the world, most often through artist-driven initiatives. Ünsal is the founding editor of the artist-centred platform m-est.org. She co-facilitated the Arter Research Programme, 2019–2021.

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Poetry

Christopher Konrad

Moth Graffiti

ust under the surface the moth grub tunnels and
when the tree sheds the old bark new secrets
are revealed, ciphers begging to be broken, sacred scriptures
we read like quantum equations or calculus solutions

Ogmograptis scribula reveals her soul in the ink-sap of the tree
she maps ancient songlines for us to follow
rivers, gullies, rocky outcrops, spinifex trails, crystalline ranges
her ancient glyphs which we have failed to decode

Eucalyptus haemastoma Rosetta lend me your body
tell me terrible things, let the world finish its inconsequential stuff
What *geheimis* do you share with little sister moth?
Arboreal-cursive teach to me your dreamtime stories

Christopher Konrad is a Western Australian writer and has many poems and short stories published including several books of poetry and a collection of short stories. He was winner of the Tom Collins poetry prize (2009 and 2018). His latest book is a collection of short stories, *The Voyeur* (Balboa Press, 2021).

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Book Reviews

Jayson Maurice Porter

Zoë Schlanger. *The Light Eaters: How the Unseen World of Plant Intelligence Offers a New Understanding of Life on Earth*

London; New York: HarperCollins, 2024.
ISBN 9780063073852 (HB).

lant volatiles are the chemicals plants use to communicate or share information. In 2012, James Blande described the biochemical synthesis of volatiles as a 'language' consisting of precise 'sentences' made from a 'vocabulary' of complex compounds (p. 153). Environmental scientist Heidi Appel states that certain plants release their own pesticidal defensive compounds after particular sound cues. Scientists like Blande and Appel imagine noisy ecosystems, full of chemical-based plant chatter that humans cannot hear. If scientific disbelief initially hampered the study of echolocation in bats and dolphins, Zoë Schlanger asks if the same could also be true for plants (p. 113–14). Do plants communicate in ways that alter how we define communication? Can pollution and climate crises change how plants communicate? In a dangerous feedback loop, Schlanger notes how industrial pesticide use has left us with less than Silent Springs without birdsong (a reference to Rachel Carson's 1962 classic); pollution has also created 'silent fields … mute in their moment of danger' (p. 156).

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Zoë Schlanger transitioned to writing about plant life from climate journalism with a bang, which, unlike plant communication, is audible to all. *The Light Eaters: How the Unseen World of Plant Intelligence Offers a New Understanding of Life of Earth* is a bold and blaring book that lives up to its name. Using a 'system that lets journalists see the latest research before it's available to the public', Schlanger went from investigating climate papers to botany journals (p. 9). She quickly realised that new observation technologies, such as volatile chemical readers, were fundamentally changing what scientists think constitutes a plant, plant life and plant intelligence (pp. 5, 247). What results from her inquiry is a careful ethnography of plant scientists in turmoil over the questions of plant intelligence – such as does plant intelligence exist, how do we know, and what does it look like? *The Light Eaters* is a stunning glimpse into the humbling and buzzing world of plant science that is actively reevaluating our understanding of lived concepts like intention, memory and communication.

Interpretations change. We tend to associate hearing with ears, sight with eyes and thinking with brains. However, most people do not associate all brains with thinking in the same way they imagine all ears hear and all eyes see, albeit in different ways on different registers. Since plants do not have ears, eyes or brains, people usually imagine them as living beings without hearing, sight or thoughts. Plant scientists, in particular, have historically refused to refer to plant behaviour in such anthropomorphising terms. However, scientists are changing. Some plant scientists are growing more comfortable using words like communication and intelligence instead of behaviour and senses. This is not because they believe plant intelligence is comparable to human intelligence; instead, they suggest that humans do not have a monopoly on what constitutes intelligence in the kingdoms of fauna, flora or funga (p. 22).

Language matters. Plant scientists choose their words carefully because it has implications for funding and questions of legitimacy. Schlanger convincingly shows how the New-Age style definitions and renditions of plant intelligence in *The Secret Life of Plants* (1973) effectively foreclosed plant-behaviour research for two generations.[1] *The*

1 Peter Tompkins and Christopher Bird, *The Secret Life of Plants: A Fascinating Account of the Physical, Emotional, and Spiritual Relations between Plants and Duman* (New York: Harper Row, 1973).

Secret Life was a 'beautiful collection of myths' that captured popular 'imagination on a global scale'. However, according to botanists at the time, it also caused irreparable harm to the field of plant sciences. According to those botanists, the 'twin gatekeepers of science funding boards and peer review boards' were always conservative and began to flag any study that alluded to plant behaviour (p. 15). Fearing censorship, plant scientists developed a new language to circumvent anthropomorphic terms, such as seeing, hearing, remembering and thinking.

The renaissance in plant intelligence studies began to mount in 2006 when formerly marginalised scholars of plant behaviour formed the Society of Plant Neurobiology. This group did not establish a consensus on language, but it offered brave, pioneering and well-positioned scientists a community to share their research on how plants see, hear, remember and think.

Schlanger has an infectious knack for introducing these researchers and detailing their experiments. Each researcher introduction comes with a re-introduction to an ostensibly familiar concept. The author goes to great lengths to present scientists as people who carry doubts, fears and curiosity into their work. Like a great ethnographer, Schlanger details more than Susan Sultan's ideas on evolutionary plant ecology. She also illustrates how Sultan presents the information, noting the pauses they may take to 'select the best word' (p. 220). That does not mean Sultan, a History and Philosophy of Science major, believes that the best word is always the best. Words and contexts change. Even words as simple as the 'environment' can be complicated by the Sultan's interpretation that control environments do not exist because an 'organism shapes its environment while its environment shapes it' (p. 226).

When Schlanger introduces ecologist Consuelo De Moraes, you meet a complex person who uses wonder as a primary research method but will not share anything that could not pass peer review. De Moraes discovered how certain plants signal wasps to attack leaf-eating caterpillars in the late 1990s, and she continued investigating 'biocommunication' for two decades without necessarily using that word (pp. 138–39). Precaution and downright fear were ubiquitous. As plant evolutionary ecologist Susan Dudley was making the discovery that plants have enough social intelligence to know who their siblings are, she admitted that her controversial result 'was satisfying and also kind of scary' (pp. 196, 198).

Schlanger blends ethnography with memoir to introduce her plant experiences and thoughts. After investigating how plants listen, feel, touch and exchange information, Schlanger provocatively asks: What good is all that sensation without the ability to remember it? (p. 120) Diving into plant memory started with scientific studies of the memory flower (*Nasa poissoniana*). However, it ended with her experiences growing garlic, which needs to remember the winter to sprout. For garlic, as well as tulips and daffodils, vernalisation is a 'memory of winter', a kind of climatic scarification or weakening of a seed's coating to encourage germination. For Schlanger, these plants are instructive and comforting; they 'know how to wait, how to endure the inhospitable, knowing their time has not yet come but will' (p. 126).

The Light Eaters is full of other powerful takeaways and insights. Most notably, Schlanger shows that ecologists, entomologists and zoologists have made significant contributions to plant science by viewing plants from the perspective of animals, insects and other plants (p. 49). Relatedly, she notes that intentionality is difficult to discern in plant intelligence and communication because 'we don't know what it's like to be a plant' (p. 57). These takeaways bring up another axiomatic statement: all biology is ecology, which is a critical reminder that the 'ecosystem dynamics that ecologists study apply just as easily to single plants' (p. 228). According to Laura Maurglis, for instance a single organism might appear to be one thing, but after closer examination, it becomes more apparent that many are composite organisms comprised of an ecosystem of organisms (p. 188).

Finally, through Schlanger's demonstration that plants are animate creatures that feel, remember and process information, she argues that our moral attention to living things is not finite. Our laws and legal systems need to expand alongside our expanding laws of chemistry and biology (p. 256). Similar to how political revolutions altered laws and measurements of progress (i.e. the French Revolution and the Metre), Schlanger insists that scientific revolutions in the understanding of plant life need to change how we imagine, value and attempt to govern life in general.[2]

What of the new technologies of observation shaping this revolution in plant science? Are they accessible? Does placing technological

2 Ken Alder, *The Measure of All Things: The Seven-Year Odyssey and Hidden Error That Transformed the World* (New York, NY: The Free Press, 2002).

'eyes' and 'ears' in the field reinforce our anthropomorphic framing of plant sensing as seeing and hearing?[3] With the number of women pioneering research into plant intelligence, the reader might wonder how hetero-patriarchal thinking and gender binaries have historically limited knowledge production.[4] Readers might also question how positionality (race, gender, geography and privilege) informed how individual researchers framed their work, made claims and fitted words to describe plant activity. Is it possible that only some scientists have, or think they have, the privilege to fully endorse the poetic latitudes of plant life?

Anyone who has spent time outside with botanists will recognise the wide-eyed, child-like wonderment that Schlanger describes scientists having as they ask better questions, travel into denser jungles or, on rare occasions, make new conclusions. There are few things as wholesome as watching a botanist stare at the plant *in situ* with unadulterated admiration and astonishment, and *The Light Eaters* manages to capture that light in every chapter.

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3 On new technologies of observations, such as infrared cameras, drones, night vision equipment, computed tomography and DNA analysis as 'new "eyes" in the field', see Jennifer Ackerman, *What An Owl Knows: The New Science of the World's Most Enigmatic Birds* (New York, NY: Penguin Books, 2024).

4 Schlanger indicates how Plato and Aristotle influenced the hierarchical thinking that placed plants as inferior to humans and how Theophrastus, Aristotle's pupil and successor, rejected these notions and even coined the term *heartwood,* which drew parallels between human and tree anatomy (p. 37–38).

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