Research Article

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On Vegetal Geography: Perspectives on Critical Plant Studies, Placism, and Resilience

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Abstract: This study contributes to the emerging subdiscipline of geography, defined as vegetal geography, expanding beyond Critical Plant Studies' focus on place-based interactions with and adaptations to human systems and ecologies. In this sense, vegetal geography covers political and cultural ecologies and psychogeography of events, highlighted by the recent pandemic, the ongoing threat of anthropogenic climate change, and the re-emergence of global diseases in recent years amid unrestrained consumerism and human niche constructions. These so-called Anthropocene proliferations tend to ramify the relation of place to organic entanglement with the non-organic, human with the nonhuman, which implicates species trade-offs, uncanny alliances, and affinities, via a series of differential synthesis, borrowing from Deleuze and Guattari, amid increasing climate anomalies. In the process, they engender emergent ecologies where vegetal life, a key Deleuzean concept, provides a critical pivot to interspecies relations in times of crisis and emergency.

Keywords: critical plant studies, multispecies justice, pandemic, placism, resilience, vegetal geography

1 Introduction

This study initially takes off from Anna Lawrence's introduction of the concept of vegetal geography in her article "Listening to Plants: Conversations between critical plant studies and vegetal geography" (2022). Lawrence proposes an umbrella term to represent geographical works in which vegetality, or vegetal thinking (inspired, among others, by Deleuze and Guattari's *A Thousand Plateaus*), offers a critical lens for understanding the topology of multispecies relations across lived ecologies. Lawrence's essay lays out the initial task of this nascent discipline by establishing a *non-ontological* arc (citing Head & Atchison, 2009, p. 237) that traverses ethics (traditionally sourced from animal agency) and plant life which enables interspecies coalition work (Hall, 2011), not just with animals.

To the extent that this paper commits to elaborate and expand on the above proposal by Lawrence, the present study's broader focus on the *non-ontological* initially imparts a *connective* synthesis of the two disciplines, picking up from a Deleuzean process, manifesting a "single series of composition, mixture and aggregation" (Nail, 2021, p. 23). In our discussions, we will expand on the other two syntheses from a Deleuzean perspective, such as the disjunctive and the conjunctive. At the outset, we emphasise the *single* series on account of the organising capacity of what the active subject in this connection performs, but active only in the relative sense.

Plant thinking adopts the standpoint of a passive genesis; otherwise, a "pronominal model" (Deleuze, 1993, p. 213), akin to the psychoanalytic approach to the pre-genital ego, essentially, a pre-reflective, pre-homocentric I. As it were, the model rejects a kind of positive ontic self-rule against the background of the concept of the

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univocity of being central to Deleuze's philosophy (Patton, 1994). As he argues to this effect, "[t]he essence of univocal being is to include individuating differences," and "while these differences do not have the same essence" (Patton, 1994, p. 34), they "do not break the unity of its sense," such that the distinction between beings is a "modal, not a real dimension" (Patton, 1994, p. 304). Against this background of univocity, Critical Plant Studies, however, are still preoccupied with cementing the ontological nexus of plant otherness and human agency.

For most proponents of plant studies, this relation is supposed to inspire ethical imaginations analogous to visions of democratic human societies and post-human social ecologies (Marder, 2013). The emphasis on the *ontological* is supposed to reflect the "transformative potential" of ethical imaginaries (Lawrence, 2022, p. 634), welcoming other modes of eudemonic life beyond human- and animal-centred ontologies. Nonetheless, as is the case with human–plant geography, a nuanced bias gives an ethical premium to human–animal relations, isolating plant life from the coordinates of value generation to the extent that "[b]etween plants and humans, there is arguably a greater ethical distance" (Head & Atchison, 2009, p. 236).

Lawrence's study underscores this point and offers a timely reimagining of this ethical distance by taking off from recent works that engage this bias typically configured around the dualist approach to ontological alterities, such as plant otherness vis-à-vis the predominant trace of ethology or animal agency across the ethical insinuations of human–plant geography, broadly construed. In citing Houle (2018) and Pouteau (2012), Lawrence demonstrates the unsuitability of the Cartesian model to plant otherness. Unlike animal bodies, which are "bifurcated by the mechanism of gastrulation – an early embryonic transformation which gives rise to a dualistic state of being divided between the inner (mouth, digestive tract, anus) and the outer," plants do not have the similar inclination to adapt to Cartesian binarism, "facing only outwards and thus demanding their own phyto-specific ontology which resists the inherently oppositional dualisms of 'animalesque' thought" (2022, p. 635). This non-dualistic ontology is the focal point of this essay's turn to the non-ontological dimension of vegetal geography.

Listening to plants must also get us to listen to non-ontological (i.e., geographical) tensions that history complicates. In this framing of history and geography, we expand on Thomas Nail's *Theory of the Earth* to identify this geographical feature eponymously as a vegetal tension that modern history has dealt with, beginning with centuries of species dispersal, specifically in places plundered by colonial powers, and today, by massive ecological destruction. In the wake of the planet using up an enormous volume of waste products borne of these so-called vegetal tensions, which Nail, echoing the natural sciences, identifies oxygen as necessary to fuel the Earth's metabolism (Nail, 2021, p. 191), animal life, under which humans broadly originated, emerged over time. For the last 300 years, these tensions have concentrated in today's fossil capitalism, modifying the thermodynamic terms of human consumption, mobility, and work, and the discovery and production of knowledge and material goods. In turn, these tensions engender consequent relations, along with their pros and cons, assembling new relations of transcorporeality (Alaimo, 2012) and attunements of a psychogeographical nature, which, as one study portrays, "spatiotemporally [distribute] *sym-poietic* assemblies" (Mcphie, 2018, p. 311) even as they forge topological interactions between and among multiple species/actants. To this extent, the emphasis on ontology above gives way to the plasticity of species/actants forming recombinant assemblages, thus disrupting each internal causation to forge co-causation with others. Insofar as the elements of the assemblage are, in principle, "fragmentary surfaces or volumes" (Deleuze & Guattari, 1996, p. 40), partially dislocating internal coherences for recombinant purposes, assemblages express that things do not have permanent, stable essences.

Here, we arrive at the second synthesis: fragmentary assemblages *resonate* the divergent relations of actants and, subsequently, *ramify* (Deleuze, 1993, p. 236) their distinction as a "modal" performance, like a "mirror for the condensation of singularities and each world [singularity] a distance in the mirror" (178; *bracket emphasis mine*). The disjunctive synthesis of fragmentary wholes is the "ultimate sense of counter-actualization" (Deleuze, 1993, p. 178), or the decentering of identities, in light of the vegetal tensions we draw from Nail's *Theory of the Earth* with the topological exchanges they enable that blur conventional terms of affinities, alliances, and associations, but not overtaking their established terms of contact.

Meanwhile, aside from our textual encounter with Lawrence's essay, what has made the present study pivotal to vegetal geography is the work done by Searle and Turnbull (2020) concerning quarantine ecologies.

Searle and Turnbull offer a critical catchphrase that led the study's proponents to consider the historical spectrum of vegetal tension that could explain the emergence of quarantine ecologies amid climate change and the acceleration of economic progress driven by technological innovation. Climate anomalies and economic crises turn out to be an igneous pack that can set alight a host of environmental, cultural, and psychogeographical pressures, which, incidentally, the pandemic magnifies.

The revival of plant care and plant growing since the onset of the pandemic testifies to various, albeit "minoritarian" attempts – again, to borrow from Deleuze and Guattari (1996) – to promote ecological consciousness, compared, for instance, to how capital, as a vast machinic counter-flow, exploits planetary resources. Plant thinking underscores the necessity and the urgency of "multispecies cooperation, cultivation, and care" in the hope of "[fostering] more liveable futures" (Searle & Turnbull, 2020, p. 294). To this extent, we will briefly explore the (1) renewed interest in plant care amid the global outbreak that some scholars describe as a botanic bloom (Burke et al., 2022), which, despite its popularity, could still gloss over the fact, mainly due to the biopolitics of the global health crisis that the pandemic is a multispecies story (Kirksey, 2020), which, as we claim, pivots around the predominance of vegetal life, without diminishing the importance of other life-forms; (2) the more-than-human ethical imaginations that vegetal thinking enables against the prevalence of plant blindness (Wandersee & Schussler, 2001) that has shaped the anthropogenic responses to ecological change, starting with extensive global transfers of plant species in recent history and the course of human systems' response to the world pushing back, and lastly, (3) the role of vegetal geography in the call for multispecies justice (Celermajer et al., 2022). The latter can build on the lessons of the 2020 pandemic as an interspecies coalition event, the broader appreciation and awareness of which, nonetheless, is stymied by a host of external factors, from the biopolitics to the geographies of COVID-19 (Delaney, 2020; Eaves & Al-Hindi, 2020; Rose-Redwood et al., 2020).

As an interspecies event, the pandemic calls for a more-than-human perspective (hence, the appeal to geographical scale) to address this recent threat to species survivability. But the vulnerability of humans to viruses is as much the result of anthropogenic systems overtaking other life worlds in terms of energy expenditure and the volume of waste produced on the sidelines, leading to logistical disasters and social crises attendant to population management, greenhouse regulation, and the ecological cost of the extinction of lower species at an accelerating rate (Ceballos et al., 2015).

Plant thinking offers a conceptual spectrum to multispecies justice, employing the simile of resilience between plant life and, most crucially at this point, indigenous epistemology. At this juncture, we take this resilience to be vegetal in nature, depth, and scope, akin to performative poetics in terms of a boundary object, developed by Brand and Jax (2007), "floating between descriptive and normative meanings" of resilience. For Brand and Jax, this concept of resilience acts as a boundary object – the vaguer resilience as a concept is, the better it fosters communication and dialogue across disciplines and between scientific research and praxis. As plant studies scholars have emphasised, plants could "perform" poetically, starting with "bearing seeds, irrupting in flowers, sprouting rhizomes, uncoiling leaves, attracting pollinators, garnering human attention, and mobilising transnational network" (Vieira, Gagliano, and Ryan, 2016, p. xix). Moreover, this concept of resilience adeptly suggests the possibility of the third non-ontological synthesis.

In the "migration" of the series from the first to the second, the connective and disjunctive syntheses leave a veritable "remainder or residue" (Deleuze & Guattari, 1987, p. 326). With this new conception of resilience, at least, as far as we, this paper's researchers, deem it to be more coeval with Lawrence's proposal of vegetal geography, we can treat this concept as that which guides the passage from one series to another but still leaves a residual array of what Deleuze and Guattari termed "decoded flows" (1987, p. 452). To this extent, vegetal geography reflects the resilient character of the series of syntheses, "a whole *generalised conjunction* that overspills and overturns" (p. 452) the previous series, in line with the ambivalence of the boundary objects that vegetal tensions represent in the broader spectrum of geological objects. This ambivalence supplies a consensus in human–plant geography based on the non-ontological dimension we proposed to redefine the place of Critical Plant Studies under the umbrella term of vegetal geography. This study concludes with the idea of plant resilience as a "boundary object," whereby species cooperation, almost in the guise of mutual aid, magnifies the non-ontological affinities and alliances that bind vegetal geography and plant intentionality in terms of scale (i.e., geographical tensions) or by poetic performativity (which plant studies would attribute a

certain degree of vegetal intention). This emergent fusion parallels a Riemannian space in relation to two "neighboring observers," say, for purposes of this essay, plant studies (bridging the ethical gap from intentionality) and vegetal geography (focusing on geophysical tensions), a conjunctive aggregation that, as Deleuze and Guattari argue in *A Thousand Plateaus*, citing Albert Lautman,

> [locates] the points in their immediate vicinity but cannot locate their spaces in relation to each other without a new convention. Each vicinity is therefore like a shred of Euclidean space, *but the linkage between one vicinity and the next is not defined and can be effected in an infinite number of ways.* (1987, p. 485)

The comparison to Euclidean space indicates where the intersecting lines of connection occur in the first connective synthesis. Thus, the third conjunctive synthesis, henceforth assumed by the fusional role of "vegetal tensions" in this essay, exhibits an analogous series with Riemannian topology, which accommodates and adapts to a heterogeneous series (the disjunction) taking place "in continuous variation, a smooth space, insofar as smooth space is amorphous, and not homogenous" (1987, p. 485).

2 Plants and the Pandemic: Resilience and Ethical Agencies

Since the onset of the pandemic, plant care has revived and mainstreamed alternatives to deal with crises and emergencies (Burke et al., 2022). Italy was a case in point, bearing the brunt of the early wave of infection across Europe. Lessening COVID-19-related psychopathological distress became the primary focus of the region's plant care and gardening activities (Theodorou et al., 2021). Echoing similar attempts around the world, the Cultural Association of Occupational Therapists of the State of Paraná (ACTOEP) advised gardening and plant growing amid prolonged home isolation due to lockdowns and quarantines (Reis et al., 2020). The pandemic has escalated plant growing and caring into an unprecedented "botanic bloom" alongside the awareness of sustainable practices in times of crisis and emergency (Burke et al., 2022; Rivas & Biana, 2021).

Plants are the prime model of multispecies resilience responsible for the planet's biodiversity (Zhong et al., 2013). This fact about plant life, which resonates with a sustainable paradigm of co-habitation, is known to Indigenous Peoples worldwide (Barker & Pickerill, 2020). Here, we can underscore the positive correlation between Indigenous knowledge and a place-based modal organisation of multispecies' flourishing (Zurba et al., 2019), where plant life occupies the central structure of kinship relations and community ethos (Miller, 2019). As Michael Marder argues, "the plant's being-in-a-place is far from a passive inclusion," such that in a given ecological habitat, the place itself "dynamically emerges from the plant's living interpretation of and interaction with its environment" (Marder, 2013, p. 1367). This interpretation gives plants other-than-human-intentionality, which echoes Levinas' ethics of transcendence (Marder, 2013), seeking to undermine ontology with its singular emphasis on identity, the ego, or the sovereignty of the I. Since Aristotle, apart from the eudemonic time of human actants, vegetality has never been acknowledged for its sense of temporal autonomy to flourish. Aristotle, however, accorded plant life a form of heteronomy distinctive to its openness to other organic elements, further suggesting a coalition of properties and events:

> [A]ll herbs whether they grow above the earth or in it, depend on one of these five conditions: seed, moisture from water, a suitable soil, air and planting. These five, one might say, are the roots of plants [*rizai phuton*]' (1963, pp. 827a, 2–7).

Thus, we can consider vegetal life groundless insofar as it resists the adoption of its primary rootedness in an undifferentiated substance, matter, space, and time. As Marder adds: "[T]he spatio-temporal movement of plants, nonsynchronous with human time, is directed toward and by the other" (Marder, 2013, p. 12). This otherness inheres in humans, partly a heritage of vegetal tensions from geological ages before the planet "*became animal*" (Nail, 2021, p. 177). Accordingly, our origin as a species reflects the degree to which plants suggest the continuity of capacities, first outlined by Aristotle, originating from the lowest level of plant life (Marder, 2013) and culminating in the nervous system.

Unfortunately, this concept of alterity would suffer from a form of discursive malaise, such as linking the concept of heroic transfiguration to the idea of autonomy, modeled on rhizomatic or vegetal freedom that has seen its worse consequential iterations in extremist and militant forms of nationalist and nativist paradigms. Marder would attribute this abuse to a hyper-relativistic, liberal interpretation of the "will-to-power," an idiosyncratic *raison d' être* as the motivational structure of vertical power hierarchies, such as the colonial machine. Such power attunements silhouette the interpretable plasticity of the "groundlessness" of vegetal life in the non-ontological sense of alterity, a kind of "perpetual withdrawal from the hermeneutical grasp" (Marder, 2013, p. 186), yielding a notion of indiscernibility that, *ipso facto*, commands a self-grounding ontological narrative. Without a single ground, a representable substance on which a thing depends other than itself, a plant does not maintain a positive self-identity in the sense that it "rejects the principle of non-contradiction" and "is not at all opposed to its other" (Marder, 2013, p. 164).

As emphasised, however, this concept of capacitation by plant autonomy may lend itself to an exploitable value interpretation, like a "groundless autonomy" as an "experiential corollary to nihilism" (Marder, 2013, p. 136). Alterity gives way to a liberal or fascist inclination of heteronomy, the double othering of alterity as a mode of dispersing its already differential meaning. This is a "[parasitic exploitation] of the heteronomy of vegetal temporality" (Marder, 2013, p. 101), symptomatic of a double bind. As Marder (2013, p. 102) summarised as follows, invoking a differential analysis of the appropriation of the solar economy by capital, with this "[s] tanding in for the other, in which the plant's being accomplishes itself without reflectively returning to itself, capital eclipses the sun and the power of the nutrients contained in the earth." Nature served, as it were, as the background of the dispersing hero, the subject of the will-to-power, bringing ecological destruction, for instance, in the aftermath of the global transport of "exotic plants and peoples" (Haraway in Mitman, 2019, p. 8), mainly to bolster plantation economies.

But with climate change and the pandemic, the effects of these vegetal tensions have accelerated to a point when the model of vegetal resilience comes around to offer more than a survival toolkit for our ecologically challenged age. Indigenous Peoples and First Nations, victimized by the romanticist othering of the West, have exemplified this model, forging interspecies affinities and alliances across the integral landscape and topography of vegetal geography, bringing to light the holistic character of their collaborative approach to ecological change (Biana & Rivas, 2022).

3 More-Than-Human Ethical Agencies and Imaginaries

With vegetal tensions rising amid climate change, the pandemic ushers an event in vegetal geography that reveals the multispecies story behind the virus' propagation (Kirksey, 2020) and the recent re-emergence of global diseases. This multispecies tale, so to speak, manifests a geographical relationality that exceeds the idea of groundedness, or "depth" metaphysics (Deleuze & Guattari, 1987, p. 270) that grounds thinking too deep in a place to flourish (Marston, 2000). As it were, groundedness is prone to place-based ethos, customs, and traits, the whole potential gamut of nativist construction of minds and practices resistant to external influences and, thus, susceptible to illusions of purity.

The concept of groundedness is a crucial feature of phenomenological thinking concerning the possibility of being encountered by the movements and attunements (i.e., the different histories) of being. Its philosophical connotation unsurprisingly resonates with one of Heidegger's later concepts, that of the "four-fold" (2010, p. 115), comparable to structuring the world from local, regional, to national [and] the global (Marston, 2000, p. 220). A world ordering like this, premised upon the completion of an authentic sense of *in situ* becoming, acquires a transcendent status from which one retrospectively looks down on the ground of ontic self-privileging. This place-based orientation, alongside the vertical, top-down nature of production and creation it encourages and enables, is at risk of becoming predisposed to adapt to a hierarchy of power attunements.

This criticism of place-based phenomenology, typical of Heidegger's relegation of vegetal life to a level below the significance of the rootedness of human existence, also extends to the criticism of ethical

transcendence, such as Levinas' defiance of the highhandedness of ontology, ironically, an attempt to address the limitations and dangers of placism itself, intrinsic to Heidegger's phenomenology. From a placist perspective, displacement and uprooting are considered unfavorable conditions of human flourishing, "as when a plant is removed from its native soil" (Marder, 2013, p. 58). However, Levinas' challenge to placism retains the perceived insignificance of plant thinking, especially concerning religious sensibility and symbolic association with paganism.

But more than the uncritical equation of inertness and paganism about plant's rootedness, the misallocation of identities in the context of place-based terms of human flourishing betrays crucial negligence, if not ignorance of the capacity of plant life to support systems that "expand and multiply beyond human boundaries" (Maizza, 2017, p. 216). Scholars of Indigenous studies describe this as the scalar view of animistic religion with its plant-based ritual practices (Nuckolls, 2010; Praet, 2013). Praet, for instance, asserts: "What always recurs in such forms of animism is a Humanity envisaged as an ongoing fabrication rather than as a guaranteed status" (Praet, 2013, p. 203). Contrary to Levinas, plants and Indigenous Peoples (who believe in shamanism) are known for their "contempt of boundaries" (Mabey, 2011, p. 82).

Indeed, plant domestication (designed for plantation economies) in colonial times had to deal with invasive plant species and alien superweeds challenging the Western idea of borders (Argüelles & March, 2022; Atchison, 2019) and, by extension, the paternal vision of functional ecology. This vision is concentrated in the nuclear family as the ethical unit of order and symmetry compared, for instance, to periodic social experiments carried out by some indigenous communities (especially in shamanistic Amazon) to relax the bounds of marriage to "leave aside their jealousies" and sustain a cooperative society (Miller, 2019, p. 208). Back to superweeds, some of these alien weeds adapt to herbicides (Atchison, 2019). It pays to note that extensive boundary-making was introduced in the colonies by the Western reshaping of its interior landscape, a practical knowledge partly influenced by the Eastern practice of gardening (Glacken, 2020), further boosting the Western approach to settler colonies beyond Europe, refining models for demarcating borders that separate the colonial seats of power from their subjects, colonists from subalterns, the mainland from the islands (Baldacchino, 2010; Chandler & Pugh, 2021; Hayward, 2012). Throughout the creation of plantation economies in the course of colonial history, this spatial logic of bordering was consecrated by the transport and forced migration of "exotic plants" and "peoples from other places" (Mitman, 2019, p. 8), altering the demographics and aggravating the already existing system of slavery not only of humans (Indigenous Peoples, women, Blacks, etc.) but also non-humans, plants, and microbes. Indigenous Peoples and ecologies were dispossessed of their habitats, disrupting the relationality of human–non-human geography in favor of a unilateral, humanist conception of nature, economy, and religion.

This colonial bordering also generated a wide-ranging simile of assemblages between subalterns and plant life through the expansion of the modernist worldview against so-called "barbaric customs and, at the same time, as an effort to tame a wild and unruly nature" (Vieira, 2015, p. 217). A new political ecology overtook the existing ecological framework that once characterized the material production of Indigenous life and their spiritual needs as a people outside the world-making model of the West. Over time, this created problems for the colonial dispensation as continued oppression and persecution of subaltern people, such as migrants, outlaws, and insurgents surrounding plantation economies (Wolford, 2021), and dispersal of plant species (Capinha et al., 2015) propagate novel identities resulting from what human–plant geographers describe as "vegetal cosmopolitanism" (Head et al., 2014). This uncanny vegetal flow redefines geographical forms of relationality, which reflect more-than-human ethical imaginaries that inspire revolts, insurrections, and reforms, inconceivable without the presupposition of the knowledge of plants' capacity to respond morphologically to environmental changes, including outside threats, an essential aspect of vegetal intelligence that offered a model for anti-colonial resistance. In his *Theory of the Earth*, Nail (2021, p. 150) echoes this crucial aspect of vegetal intelligence in the form of a "collective affair [like eavesdropping] on one another," in case of environmental threats, "and [using] this shared knowledge to prepare themselves ahead of time."

In remote South America, this concept of vegetal intelligence is remarkably manifest in plant kinship, signifying "consubstantial relationships among human adults and children, as well as between human gardeners and seed infants" (Miller, 2019, p. 211), which, in the face of development aggressions Indigenous communities face in a post-colonial world, serves as a go-to-resilience model. Over time, this type of aggression

impinges (1) on indigenous livelihood (forcing them to depend on outsiders) and collective spiritual life in the case of (2) periodic emergence of messianism in places where food shortage threatens prolonged struggle with environmental and psychosocial stressors and development policies outside their control. It is no surprise that, as Rangan and Kull (2009, p. 29) argue, the "drama of plant transfers by European colonial expansion and how these activities transformed natures and societies [over time] in every part of the world" have shaped contemporary political ecology weaving together issues of multispecies survival, climate, race, gender, and class.

4 The Multispecies Arc of the Pandemic

Long before the onset of the pandemic, scholars have championed plant thinking as an integral component of the call for multispecies justice, making it an alternative, among others, to the acceleration of economic progress responsible for the loss of biodiversity and forced extinction of lower species recorded in recent decades (Ceballos et al., 2015). Suddenly, but at an inauspicious time, plant thinking has enjoyed a global reception in various care-related forms of crisis adaptation and pandemic resilience.

No doubt, the pandemic has also generated a counter-intuitive history. Where COVID-19 reveals that what we know as human nature is nothing more than an "interspecies" relation, "only-human stories" will not address the problems and challenges of the present characterized by ecological and health crises (Van Dooren et al., 2016, p. 3). Thus, "following the wisdom of the plants" yields a differential analysis of geophilosophy, evoking an integrated landscape and topology of interactions, adaptations, and conjunctions, underscoring a process of "aparallel evolution" in a Deleuzean sense:

> [S]tart by delimiting a first line consisting of circles of convergence around successive singularities; then you see whether inside that line new circles of convergence establish themselves, with new points located outside the limits and in other directions. (Deleuze & Guattari, 1987, p. 11)

No less a form of vegetal geography, "following the wisdom of the plants" leads to a fundamental awareness of the dismal condition of the earth's present biodiversity, where vegetal life suffers from massive ecological destruction: deforestation, aggressive land use, habitat destruction, etc., and how, at its current rate, the acceleration of economic progress has led to forced extinction of lower, non-human species. All this makes the call for "ecological change political" in terms of the politics of "counter-human privileging" (Rangan & Kull, 2009, p. 29) patterned after plant becoming, essentially, the becoming-other of identity and time (Deleuze & Guattari, 1987, p. 284) characteristic of the differential memory of the planet that precedes and exceeds human time, wisdom, and memory. As Nail asserts:

> Vegetal life does not emerge on the earth; instead, the earth becomes vegetal. The most significant error in thinking about vegetality, or plant life in general, is to think of plants as distinct or separate from their deep historical emergence as cosmic and earthly bodies. Plants are fallen stars, minerals, air, and water. They are made wholly of the stuff of the cosmos and the earth. (Nail, 2021, p. 136)

As a "theory of the planet," vegetal life is co-constitutive of the earth's becoming, arguably, the "historical name of the tensions of the planet" itself (Nail, 2021, p. 139). Animal life was borne from these tensions, plant-like "electrochemical communication structures, which evolved prior to animal nervous systems" (Jedlicka, 2017; Nail, 2021, p. 185). Incidentally, the pandemic reveals the vegetal form of this historical tension – humans forming a kind of biotic alliance with viruses (Deleuze & Guattari, 1987, p. 10). Humans do not behave or generate themselves like plants. Instead, they have become plant-like in and through a kind of generative "experimentation in contact with the real" (Deleuze & Guattari, 1987, p. 12), bodily natures at risk of infection, but also enhances our knowledge of species survivability through "another possibility of bodily formation" (Miller, 2002, p. 18). Deleuze & Guattari (1987, p. 12) liken this transformation to an orchid, which "does not reproduce the tracing of the wasp; it forms a map with the wasp, in a rhizome."

But what do rhizomes-as-maps do? The pandemic has exposed how, as they face the threat of infection, humans participate in a new relational ontology (which subsequently requires adapting to a new normal) amid the "ebb and flow of agency in multispecies world" (Van Dooren et al., 2016, p. 5), and, which, as a result, generate "modes of microbiopolitcs" (Lorimer, 2016, p. 59) or, to be more precise, "biogeochemical processes that [humans themselves] have disturbed … [force] their way into the centre of the political stage and of [their] everyday lives" (Bonneuil & Fressoz, 2016, p. 30). The pandemic has revised plant thinking from passive to participative actant in an evolving assemblage (Dwiartama, 2016) that we are, thus, forced to live with.

Moreover, as an eventual intervention in vegetal geography, the pandemic highlights, as emphasised, a simile of assemblages in the process of recursive causation. Primarily because of human dependence on food (Head & Atchison, 2009, p. 236), plant species transfers, in varying scalar magnitudes, from settler colonialism to plantation economies to the present global industries, have become co-determinants of the worldwide creation not only of "regional economies" but also geographical identities (Rangan & Kull, 2009, p. 30), underscoring the *vegetal cosmopolitanism* (Head et al., 2014, p. 863) that these movements presuppose. Since the onset of neoliberalism, these vegetal transfers have involved "global migrants, both human and nonhuman, who produce and consume landscapes and knowledge, remaking the world as they go" (Rangan & Kull, 2009, p. 33). Global migrants generate a planetary flux of capital, labor, and vegetal tensions, which, in turn, remake the economic and political landscapes. At the same time, these movements produce the conditions for ecological and demographic displacements involving microbes now considered "threats to the security of the state and to the international order" (Snowden, 2019, p. 466). Fuentes sums up these movements leading to the pandemic:

> Contemporary human niche construction is not only about the emergence of urban landscapes, motorways, redirected rivers, filled-in coastlines and expansive agricultural processes but also the creation/restructuring of societies and cultures, of histories and perceptions of who and what is 'natural' and who and what are 'preferable.' Human niche construction creates simultaneously ecological, biological, social, political and economic systems that are always interrelated. These interrelations set the stage for COVID-19. (Fuentes, 2020, p. 25)

Thus, the pandemic revealed a global ecological landscape consequent to centuries of humanity's blindness to vegetal geography, which includes food plants and non-food varieties (Head & Atchison, 2009, p. 238), absorbing too much carbon that contributes to climate anomalies. Plant life movements have been responsible for natural climate change and soil erosion that pose climate threats (McGeoch et al., 2010). Still, the intensification of global trade has made these transfers more unwieldy (Argüelles & March, 2022, p. 46), concurrent with human population dynamics. Deleuze and Guattari forewarned that this resulted from the failure to follow plant wisdom and a "vegetal model of thought" overridden by human privileging.

5 Concluding Remarks

In the previous sections, we discussed pandemics' role in vegetal geography and how the latter's conversation with Critical Plant Studies is best served when vegetal scales (the whole conjunctive array of non-ontological others, as emphasised) are considered. As it were, the pandemic magnifies the time and the identity of the other, a network of others with which human lives are entangled, where plants play a significant role in holding them together in a vibrant biodiversity space.

But this multispecies capacity pivoting on plant life's coalescent nature, which involves a process of creation and renewal, does not imply that nature's supposedly renascent dynamism (often romantically conceived), thriving in the absence of human intervention, means that the planet is capable of healing. Quarantine ecologies somewhat prove this point, speaking of how anthropogenic systems were put on hold by the outbreak, providing a breathing space for nature. This leads us to Searle and Turnbull's reference to Eben Kirskey's emergent ecologies, non-human ecologies "flourishing in the aftermath of order-destroying disruptions … shaped by a multitude of creative agents" (Searle & Turnbull, 2020, p. 293), actants in the Latourian sense (Latour, 2005). These ecologies are "ecologies of abandonment," spaces abandoned by humans

where human–non-human boundaries are disrupted – wild animals crossing into urban landscapes and vegetal growths outside of human intervention, reminiscent of the Chernobyl Exclusion Zone. But these ecologies are relatively small in scale vis-a-vis the idea of a resurgent nature, that the planet is "healing."

Indeed, the idea of nature that takes matters into its own hands lacks a multispecies perspective, as if there are only two forces at work – nature and humans. On the one hand, nature is often perceived as one big undivided chunk, and humans, the active players in planetary transformation, can take over natural life as though they could entirely disentangle themselves from nature. However, nature is not an individuated dimension set apart from anthropogenic systems. Here, the "contrast between nature and culture is at most a gradual transition" (Lettow, 2017, p. 3).

Nonetheless, resurgent nature is not at all fancy thinking. For Anna Tsing, resurgence can be a constructed possibility. As with Searle and Turnbull (2020, p. 293), resurgent nature can be planned through "specific rejuvenation of nature" from the perspective of multispecies coalition work, albeit obstructed by so-called "Anthropocene proliferation … removing organisms from their multispecies life worlds, alienating them". Carefully planned rejuvenation can be modeled on resilience based on multispecies life formations and Indigenous ways of cohabitation.

Here, we can drum up the theory of resilience that Brand and Jax proposed, considering nature's resurgence as a planned recovery. Resilience is employed to designate a "vague and malleable meaning" to establish a landscape of exploration and research that both plant studies and vegetal geography can navigate, thereby exposing the multispecies dimension of life in an open system of knowledge sharing. This makes resilience a "boundary object" that enables interdisciplinary work where the task of rejuvenation can be threshed out. Similarly, this is multispecies justice at work, based on the plant spectrum of interspecies recombination of alternatives toward resurgence possibilities. This paper, however, asserts that resurgence must also take cognizance of vegetal tensions necessary for liveable futures.

Meanwhile, while we are aware of the ongoing debates on resilience (Dwiartama, 2016; Fisher, 2016; Reis et al., 2020), we do not wish to participate in the analytic interpellation of the concept for one reason. Despite the internal tensions marking the invariance of the concept among its proponents, what brings them together is the overarching ontological context of the debate. While this concept of resilience has seen remarkable adoption globally, we still need to be wary of the ontological purchase by which its success can be generally assessed regarding forging activist networks and collaborative practices among researchers worldwide. Lawrence's essay takes us to the intricacies of this concern. Ontologies rack up a dead load of prejudices that generally lean on animal-centred privileging of entities (Lawrence, 2022, p. 630) and, by implication, despite the cautiousness of treating field subjects, presupposes a hierarchical human perspective. By emphasizing continuity and difference, Lawrence opts for a non-ontological treatment of the broader arc that binds ethics and plant studies and, more importantly, is congruent to their shared geographical context, i.e., the relational feature of vegetal tension (borrowing from Nail).

This leads us to Brand and Jax's (2007) concept of resilience as a "boundary object." Their notion of resilience, neither a perspective nor a criterion of the "division of labour in the scientific sense," which is "strongly dependent on the ability to exclude phenomena that do not meet" the scientific criterion, is a welcome infraction of the ontological imprint. In the age of the Anthropocene, this concept of resilience would mean today a constitutive form of "cybernetic resilience *dispositif*," even as the concept undergoes a discursive shift over the last two decades, in light of geophysical and technological challenges that presently inform interdisciplinary research, not to mention the humanities' turn to the "messy world of entangled human–nonhuman systems" (Wakefield in Chandler, Muller & Rothe, 2021, p. 342). Recent works on posthumanism highlight this shift within this context, noting that the "posthuman condition is computational as much as it is ecological" (Karpouzou & Zampaki, 2023). Here, it is essential to underscore that the post-WW II era saw a surge in scientific and technological progress, resulting in the rise of cybernetics in the Anthropocene. This new paradigm is defined by the intricate interplay of control and communication between living beings and machines, blurring the lines between human and non-human entities. The war's ecological aftermath exposed the difficult balance among various life forms, both organic and inorganic, triggering significant shifts in geophysical and climatic conditions. This upheaval prompted a re-evaluation of our relationship with the

environment, fostering new perspectives on living within an unstable, damaged ecosystem and spurring global discussions on sustainability (Karpouzou & Zampaki, 2023).

This upheaval is further compounded by the acceleration of technological progress since the adoption of digital technologies, which, incidentally, the COVID-19 pandemic has pushed to an unprecedented global surge. Unsurprisingly, this as-yet unmatched shift to digital life intersects with Vegetal Geography, for instance, through remote sensing, GIS technologies, and citizen science initiatives to study plant communities and their responses to environmental changes. Integrating digital tools with traditional ecological knowledge exemplifies the abovementioned "*cybernetic resilience dispositif*," demonstrating how resilience as a boundary object can bridge technological and ecological domains in pursuing sustainable solutions for the Anthropocene.

As Stephanie Wakefield describes, this topological change in the conception of resilience involves a "more grounded approach based in context-specific, complex human–non-human systems design, drawing new and old techniques together into a novel cybernetic network" (p. 342). In hindsight, as a boundary object, resilience creates a non-ontological spectrum essential to interdisciplinary approaches to vegetal tensions and, as discussed, proves more capable of forging, composing, and assembling hybridities between and among disciplines. As the recent pandemic has shown, vegetal tensions give rise to a renewed appreciation for urban vegetation, which has sparked discussions about the importance of integrating nature into city planning and design, aligning with the principles of resilience and adaptability underscored by Vegetal Geography.

Lastly, we emphasize that the convergence of the COVID-19 global outbreak and the continuing threat of climate change has brought attention to the concept of planetary health, which acknowledges the inextricable link between human health and that of ecosystems. Vegetal geography offers a holistic understanding of this link in terms of establishing a co-relational spectrum that examines the influence of plant communities on climate regulation and biodiversity, which affect human well-being. Again, this interdisciplinary approach aligns with the notion of resilience as a boundary object that fosters collaboration between and among various stakeholders – ecologists, urban planners, public health experts, and policymakers.

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