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Radicle Thought, Vegetal Language and the Metaphorics of Pedogenesis

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Abstract: Despite inter-specific kinship sensitivities and indigenous knowledge, the mechanistic and antagonistic concept of 'nature' underpins the use and abuse of biophysical resources. Recent trends in the biological sciences challenge the validity of this model. Plants and fungi are engaged in a mutually beneficial relation and can be said to have memory and intelligence. Simultaneously, vegetal or plant thinking is becoming the focus of philosophical reflection. This article argues that not only do we think like plants, we think with and through them. In order to maintain diversity of thought we must maintain the diversity of old growth forests. This is a noetic challenge to rekindle kinship with our fungal forbears so as to reroot our minds and bodies in the earth. It is also a call for the immediate cessation of mining within the threatened Tarkine Wilderness in Northern Tasmania, home to a plethora of undescribed species of fungi.

Rerooting the Rhizome

Figure 1. 'Ectomycorrhizal': Elina Niarchou, Embroidery on textile 30cm x 30cm 2021.

> We're tired of trees. We should stop believing in trees, roots, and radicles. They've made us suffer too much. (Deleuze and Guattari 15)

Ostensibly this is an article about the relation between humans and vegetal life. Actually, this is about the Tarkine. The Tarkine is a large Wilderness in Western Tasmania, an island off the south coast of Australia. The Tarkine continues to be subject to mining and logging despite repeated attempts to include it in the World Heritage list. With Gondwanan flora, it is home to a variety of endemic species and consists of many different landscapes, from callidendrous rainforest to button-grass plains and dunes. In order to put forward an argument in favour of protecting this wilderness on something more than aesthetic grounds, I suggest a descent underground to consider recent tendencies reinventing humanity in symbiotic relation with our fungal forbears.

Developments in fungal research are generating a very tangible ethic of inter-special symbiosis. However, simultaneously there is a branching off, where the information transfer and schematics of mycorrhizal relationality and flexibility are being co-opted into biometric networks of population surveillance owned by large digital tech companies. The former describes a natural evolutionary process that has taken many millions of years to develop, from which humans only relatively recently 'separated' and are now to a limited degree realising a desire to rejoin. The latter, which we will call (following Mikulak) the 'rhizomatics of domination', is the development of technologies that are so resource dependent that they actively cause the extinction of the former. This article acknowledges Mikulak's critique of the use of rhizomic theory, and argues that it can go both ways. On the one hand, the immanent future threatens a deeper immersion in rhizomorphic structures of digital biopower, with increasing restrictions and controls placed on individuals rather than on the biosecurity of companies, institutes or corporations (where the threat is much greater). While drawing our gaze away from the diversity of the world around us (and in us) (bio)technologies activate systems of control, both metaphorically and actually, reducing our ability to discern and enact diversity within our own lives. I argue that these technologies mirror natural networks and in so doing activate in us an atavistic desire to become one with the network, providing a false sense of unity and completeness. On the other hand, we have the power to expose the emotive and technological manipulation of our minds and bodies, reject claims to world domination (for example, Facebook's attempt to colonise 100 percent of the earth's population) and think in 'involutionary' symbiotic chains embedded in the real, green terrain of vegetal and fungal living.

Mycorrhizal interactions structure the evolution of vegetal life as fungal rhizomorphs coalesced with the early rootless plants and provided them with otherwise unavailable nutrients. The vegetal world is not only structured by aggregates, it is fundamentally symbiotic to a degree that boggles the mind. Interrelations are not limited to those between plants and fungi, but rather a complex system in which roots, rhizomes, bacteria, endophytes interact with rocks and soil and pass on nutrients to larger organisms, from insects to apes: all rely upon one another in order to coexist. Although our language may permit the inclusion of arborescent metaphors, the deeply embedded collusion of metaphors within the signifying chain should alert us to the real nature of more than linguistic entanglement that structures our thought and our (unconscious) minds. Rather than isolating nature to the symbolic order structured by transcendental signifiers and polarities (like nature/culture, man/woman), we can allow an earthly metaphorics to draw us down into the soil in order to rethink the human being as a being-in-nature.

This is not a call to reinstate a relationship with nature, because this overlooks the impossibility of having severed this relation in the first place. In the absence of a transcendental creator or an alien intervention, human thought is always already and necessarily earthly, originating in and sustained by the biosphere, from the air we breathe to the fruits that nourished our natality and growth. If, like good students of Lacan, we accept that there is no prelinguistic mythical state of oneness with nature, it doesn't matter that 'nature' is a useless category framing human nature and culture in the binary of self and other, because our language is already intrinsically vegetal, as well as animistic, geological, astrophysical. The word 'Nature' is not only another transcendental signifier, but it also assumes a split between the human/nonhuman and organic/inorganic. Just as Timothy Morton (*Being Ecological*) argues that we are already ecological, I argue that we are already vegetal. While Western philosophy has objectified Nature, the dependence upon a variety of species (the tree being a favourite) to provide metaphors, concepts and philosophemes as the basis of argument ('if a tree falls in the wood') should alert us to the fact that we do not only think *about* these species, but *with* and *through* them. A tree remains in philosophy, whether it is 'growing in the mind' or the actual trees pulped to make the pages.

Here I will take Deleuze and Guattari's rhizome, which poses an alternative to hierarchical 'arborescent' structures of power, as a radical starting point in reworking the relation between human beings and the biosphere that supports them. In the interweaving, mutualistic complexity of rhizomatic life within the soil it becomes evident that there is no alternative but to recognise the mindfulness of the vegetal world, our ecological interdependence, as well as its intrinsic relation with human thought and language. The clearing of old-growth forests, the few remaining sites of undisturbed, symbiotic life, is not only ecologically devastating, I argue it is also a challenge to the authenticity of the *logos*, of human reason and language.

For these reasons in this article I will parallel the possibility of reimagining vegetal kinship with examples of fungi that maintain the most intimate relation with the vegetal. Their presence in this text is an attempt stress the cosmic significance of symbiosis as well as to keep as close a connection as possible to the forest floor. These fungi can be found in the cool temperate rainforest of the Tarkine. In them we might see an allusion to ourselves. One or two of them pose a risk to the entire ecological diversity of the others, while there are others that can be found but their continued existence is precarious. Given the importance this article ascribes to metaphor, the names of the particular fungal species, their Latin binomials, play a metaphorical role in propelling the argument forward and down. Knowledge of Greek and Latin always helps, but in the absence of this I will leave some less cryptic pointers to elaborate on the play of meanings.

So, taking Deleuze and Guattari's 'rhizome' in its fecund state, releasing spores, diffusing the air we breathe, this article will concentrate on rhizome in its most material sense, in order to think about interconnectedness, but not only within the rhizome, rather interspecifically. The task here is not to reinstate arborescent symbology, but to emphasize the symbiotic relationship between fungi and plants in order to question human thought processes and activities that are putting this relationship under threat.

Mycena toyerlaricola | Threading our way through the Tarkine

Children are fascinated and emotionally involved with other species, from beetles and kittens, to the trees climbed and mosses patted. Children's films and literature reflect this, suggesting a life closely connected with all sorts of creatures, considerably different to the sterilised life the child is likely to grow into. This is no doubt because interrelation with other species is in fact essential to the becoming of a human being, though our civilisation disguises this fact. Nonetheless, much as in relational animism, in children's literature the other kingdoms, from animals to fungi, are all depicted in conversation with the human child.

> 'Aren't you sometimes frightened at being planted out here, with nobody to take care of you?'
> 'There's the tree in the middle,' said the Rose: 'what else is it good for?' (Lewis Carroll)

Deleuze and Guattari's term *Rhizome* finds its root in Ancient Greek, the preferred language of western philosophy. *Rizoma* in Ancient Greek is, according to Theophrastus in his *Enquiry into Plants*, the mass of roots of a plant (a mass noun), *riza* a single root (3.3.4; 1.1.9). *Root* on the other hand finds an ambivalent etymology in German, Scandinavian, Old English: it is the mass of roots under the ground, but it is also the plant itself, figuratively it is also the origin and cause. In Australia (where we lay our scene) the word has sexual connotations.

The linguistic confusion between the different types of roots and their translations alerts us to a natural confusion of roots. Tree roots and fungal rhizomes are deeply interconnected in a symbiotic interdependence for the transfer of nutrients. This radical con-fusion provides the basis of any further developments in the forest: if plants and fungi maintain a healthy relationship the forest functions almost as a single entity. The rhizosphere is the area around the roots of a tree where these interactions occur and the mycorrhiza is this confusion: the more than mutual symbiosis between plants and fungi that is not merely beneficial, where the roots of trees interact and interconnect with the mycelia of fungi, which in their turn interact with nutrients, and all interact with bacteria and microbiota. There is nothing more radical than this interrelation and nothing more natural.

'Mycorrhiza' describes a relation, rather than a single entity: the mutual symbiotic relationship between fungal mycelia and plant roots. It has been estimated that ninety percent of plant species are involved in this relation, while species in the orchid family cannot procreate without it. Certain trees in the *fagus* family, for example *Nothofagus cunnighamii* (Tasmanian Myrtle), share a closer relation and the Tarkine forest dominated by this species (particularly in the Corinna area) is known for fabulous displays of a wide variety of fungi. Some species of fungi share an association that is exclusively with *Nothofagus,* such as the large mycorrhizal *Laccaria species, A which* grows only in *Nothofagus* forests. The name of another forest floor mushroom, *Mycena toyerlaricola,* suggests the intimacy of the relation, as 'Toyerlare' is a northern Tasmanian Aboriginal word for *Nothofagus*. It is also believed that several *Cortinarius* species including *C. metallicus*, *C. foetens* and *C. armeniacovelata* co-evolved with Gondwanan plants such as *Nothofagus*.

Deleueze and Guattari contrast the 'arborescent' with the 'rhizomatic', where trees are equated with rigidity, hierarchy and linearity, while rhizomes are equated with movement, multiplicity and rupture. However, the roots of plants and fungi are not independent; it is a relation that in a way preceded the evolution of plants (the evolution of everything, if David Moore is correct). For the first 60 million years or so of life on land, plants didn't have roots and fungi provided this role, behaving as root systems for plants (Sheldrake 4). Then plants developed root systems that did exactly the job the fungi was doing previously. Also, the relation between plants and fungi is not singular. Fungi are promiscuous, one fungus can connect with more than one plant, and one plant with more than one fungus. This promiscuity performs an important function, for example, 'mother trees' whose huge root systems overlap with other root systems and provide protection and nutrition for younger saplings via mycelia.

The fungal mycelium is a threadlike organism living just under the earth's surface; consisting of countless branching filaments called *hyphae* (from the Greek word that means 'web'), it forms the main vegetative part of a fungus. Hyphae grow out, while septa are the cross walls linking the hyphae. A rhizomorph is a loosely or highly structured hyphal bundle. Mycorrhizal mycelial networks have been discovered to cover enormous swathes of land. Mycelia have been claimed to be the largest living organisms on earth, like the famed *Armillaria solidipes* in Oregan covering more than 2400 acres. This is a living network that communicates to its counterparts, allowing fungi to absorb the nutrients they need to grow. One should imagine a complex of white irregular netting fingering its way deep into the soil between trees and plants, enveloping and penetrating the tree's roots with fungal tissue, connecting everything that grows in a complex, decentred system without hierarchy or homogeneity: a rhizomatic structure indeed.

While we think about rhizomes, we are at risk of losing the very habitats the rhizomes require to flourish. Deleuze and Guattari were sick of trees, now we are sick for the want of them. Industrial farming, clear-felling, monocultural plantations, in fact any activity resulting in soil disturbance all tear tender filaments, breaking up the mycelia and

severing the essential inter-specific relations. Fungi require vascular plants in order to obtain nutrients like carbohydrates, but also for protection from harsh environmental forces, in return distributing nutrition as well as toxins to other species coexisting within the topographical web. We share a kingdom that evolves from the fungal. Like fungi, we too require plants in order to obtain nutrients, to breathe and to protect us from harsh environmental forces.

Laccaria species A | Thinking Radically

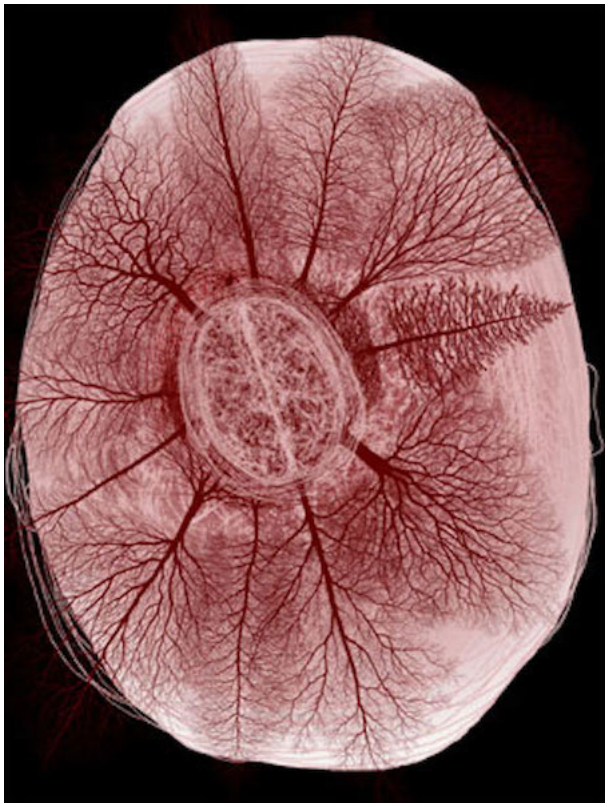

Figure 2. Andrew Carnie, Tree Pearl from 'Dendritic Forms' GV Art London, 2010.

> Thought is not arborescent… Many people have a tree growing in their heads, but the brain itself is much more a grass than a tree. (Deleuze and Guattari 15)

Unfortunately, the world of man is only symbolically arborescent. There is no latent love of trees in the texts of philosophy, only the use and abuse of tree metaphors. Why this obsession with trees? Berkeley, Wittgenstein, Saussure among others may have used the tree as a symbol or a metaphor, but did they ever try to think like a tree, love a tree, even plant one?

The Scientific Revolution and 19th century evolutionary theories combined to engender the dominant concept of nature as mechanistic and ancillary to man (Merchant 2006: 515). The philosopher Herbert Spencer was largely responsible for the modification of Darwin's evolutionary theory from one that allowed for mutualism in nature to one where antagonism spurred individuals into trait and behaviour adaptation. Where for Darwin nature was a 'web of complex relations', Spencer's social interpretation naturalised violence and the 'survival of the fittest' (Mikulak). These metaphors influenced the narratives that humankind used in order to describe the (abusive) relationship with the 'natural' world, abetting humankind's use of natural resources as well as domination over other animals.

It is as the inheritors of this tradition that a Swiss Federal Ethics Committee on Non-Human Biotechnology was established to deal with the question of the dignity of living beings with regard to plants. The result was a document outlining reasons for and against plants having intuition and the resulting moral problems. The document provides us with the basic ground of opposition: presented as an 'additional fear' was the possibility that 'ethical positions that value plants for their own sake could relativise higher-weighted moral responsibilities towards humans (and animals).' The very fact that animals have already been granted a position of sentient equality with

humans and yet in this sentence are relegated to the afterthought of parentheses should signify further what we're really facing here; we fear the intuition of plants because it may destabilise our position of power. It would not be at all convenient to have to question our use of the vegetal world; our civilisation is too dependent on its abuse.

Not surprisingly, the result of the Biotechnology document is the maintenance of human privilege over plants, of human life over plant life, and the smugly moral duty of human protection of plant life. So, a multi-million dollar corporation altering the genomic structure of a plant and then using the plant and its seeds in industrial farming is justified, but a child kicking a daisy on the side of the road is morally reprehensible.

Up until recently, sentience and behaviour were attributes limited more or less to humans and animals. And yet plants, microbes, cells all change their behaviour in the face of adverse conditions, and they all have intelligence if we take the etymology of the word ('to choose between') to demystify the concept. If memory, learning and adaptability can be observed in plants even in the absence of a brain, which research shows they can, then why not use the word intelligence to describe plant behaviour (Gagliano 65)? But recent studies go way beyond this. Gagliano argues for the extended cognition hypothesis. Extended cognition is where one actively manipulates one's external environment in order to extend cognitive capacity. Gagliano and colleagues argue that plants also extend their cognitive capacity through the root influence zone and the mycorrhizal fungi. The *Laccaria* species of fungi are the species most frequently used in research into mycorrhizal relations with other species, as species are evident in different continents and have evolved in great diversity since the early Paleocene (56-66 million years ago). *Laccaria* are ectomycorrhizal, forming an association with a great diversity of terrestrial plant species. They are crucial in the maintenance of a healthy, stable, functioning forest ecosystem. Despite being one of the few ectomycorrhizal fungi that are able to form stable cultures *in vitro* (hence its use in research), in the wild it is unable to form independently and requires the existence of a root system, even a young one. This poses a problem of precedence, as to which came first, the forest or the fungi. That said, it is assumed that this species of ectomycorrhizal fungi evolved from an earlier saprotrofic fungi, which provided the foundation for the evolution of plants.

The exciting consequence of research into ectomycorrhizal fungi is the realisation that cognitive function is an interspecies process, involving different and varied organisms. In order to 'think' the tree uses its roots, which are composed of miniscule bacteria, endophytes moving between the soil and the root hair, sharing information with the fungal hyphae that brush past. The language that biologists use to explain the mycelium's function borders on the neurological; for example, Merlin Sheldrake riffs on the 'mycelial mind' while Paul Stamets is unequivocal, calling the mycelium 'the neurological network of nature' (Sheldrake 95; Stamets 2). At first these comparisons seem like metaphors, but the more the research unfolds the less metaphorical they appear. While we try to think about plants, it turns out that plants are thinking like us.

In *The philosophy of plant neurobiology: a manifesto* Paco Calvo Garzón outlines the philosophic and scientific foundation for a new investigation into the intelligence of plants. Intelligence here is deduced from the ability of plants to engage in signalling and adaptive behaviour, in other words to communicate with others and change according to their environment. It is difficult, however, to think this through without using words that have been the exclusive right of the animal kingdom. One of the main terms of intelligence in plants under debate is the notion of plant 'neurobiology', which has until recently been considered an area of research committed exclusively to that of the brain. While in Ancient Greek *neuron* was associated with the tendons or sinews of animals, *neura* in the plural were the fibres of plants. So, without treading on tender toe tendons, I propose the term 'neurabiology', leaving the

singular *neuro-* to the anthropophallocentrics (in Ancient Greek the singular could also be used euphemistically for the penis). The fibres under discussion are important, as they provide the material focus for the intelligent activity under discussion. They are the roots. And they have long been the foundation for the root-brain hypothesis. In the 1800's Charles and Francis Darwin used a neurological metaphor to describe the sensitivity of roots.

> It is hardly an exaggeration to say that the tip of the radicle thus endowed, and having the power of directing the movements of the adjoining parts, acts like the brain of one of the lower animals (Darwin 576)

The metaphor, however, works both ways. Giorgio A. Ascoli in his tellingly named *Trees of the Brain, Roots of the Mind,* a work of theoretical neuroscience, compares the branching nerve cells, the brain's neurons, to tree-like structures. So, the brain is like a tree, the roots are like a brain and the mycelium entangled in the roots is also like a brain. Following the research of Anthony Trewavas on plant intelligence, Jeremy Narby takes the metaphor one step further: 'plants do not have brains, so much as act like them' (Narby 94).

Garzón and Gagliano do not shy from attributing more than mere signalling and adaptive behaviour to plants, but I'm sure there are very few who would be willing to concede to plants an emotional life, moral judgements, will, an unconscious. Personally, I see no reason why affect should be limited to humans, and, given the progress of research, it seems increasingly less possible to hold the opposite belief. It is illuminating as to our species-wide psychosis that humans are willing to attribute intelligence to man-made machines (albeit artificially modified), but extremely hesitant to attribute intelligence to other organisms as highly evolved, and older than, the relatively novel *homo sapiens*. Admittedly, the prospect of displacing the human from sole possession of the pedestal of conscious and unconscious thought is awesomely frightening. And to have to share it with the 'lower organisms', like fungi and endophytes, let alone bacteria and viruses, means a total upheaval of the dominant worldview as well as dispossessing western religious and scientific tradition of the exclusive claim to truth. And yet, given the science (or despite it), the content of this hypogean intelligence divaricates, branching away like the plants themselves.

According to Lacan, metaphor is a basic part of language, linking words with one another in the constant deferral of meaning and creating a signifying chain that expands like the mycelium in the soil until it creates an entire forest of words. Given the interrelatedness of mycelia and plants, could we say that it is not so much that plants have brains as that they are located within a forest, which is a composite brain-like system? The word 'mind' might fit better in this case than the more technical 'brain'. That the forest has or even is a mind that is shared throughout its many parts fits seamlessly into past mythic imaginaries. In traditional mythologies forests are frequently associated with advanced psychic states and the sharing of arcane knowledge (Porteous 12-15). Many bushwalkers today would agree that simply being in a forest inspires mindfulness. Perhaps what is being tapped into here is a material reality that is more conscious than we think.

Deleuze provides another solution that veers away from reducing the brain to the mushy grey matter encased in a skull. According to Deleuze, brain is the process of contraction and contemplation ('the mystery of passive creation') that makes it possible for a thought to arrive in the mind of a determinate person. Contemplation and passive syntheses are likened to a landscape, in which one 'is absent and yet entirely within.' (Deleuze 210) Contemplation here can be explained in its localised etymology: the place where auguries were looked at, the position from which we see the future. These processes are then transformed by the active thinking subject, who is located within the landscape prior to active synthetic processing (thinking 'the elements of matter that we contemplate through sensation'). In this landscape all things, rocks, plants and animals are contemplation.

> The plant contemplates by contracting the elements from which it originates-light, carbon, and the salts-and it fills itself with colors and odors that in each case qualify its variety, its composition: it is sensation in itself. It is as if flowers smell themselves by smelling what composes them, first attempts of vision or of sense of smell, before being perceived or even smelled by an agent with a nervous system and a brain. (Deleuze 213)

What the plant draws together, the passive syntheses of water, nitrogen, carbon and so forth then emerges as the signs of active syntheses, such as being phototropic or deciduous or aromatic. These syntheses then are taken up as signs that lead to active syntheses and behaviours of bees, birds and so forth. The brain here is like a 'sieve', filtering chaos into contemplation and passive synthesis, leading to determinate relations between organic and inorganic life.

> Not every organism has a brain, and not all life is organic, but everywhere there are forces that constitute microbrains, or an inorganic life of things.(Deleuze 212)

It is tempting to translate the immanent presence of these microbrains all around as a cosmic unconscious, although it is a difficult point to argue within the realm of western scientific discourse. Nonetheless, that roots and rhizomes have or are, or at least resemble microbrains appears a similarity closer to fact than the metaphorical language of biology would suggest.

Cortinarius foetens | The Significant Tree

> Bacteria and fungi abound to give us metaphors; but, metaphors aside (good luck with that!), we have a mammalian job to do, with our biotic and abiotic sympoietic collaborators, colaborers. (Haraway 102)

Metaphors proliferate from the brain to the tree, down through the roots and into the mycelium, spreading out, connecting, and popping up in the tree in our brain. This fractal continuum should alert us to a limit. It is our limit, the limit of our intelligence when it tries to read in the vegetal more than it can comprehend. It is the beginning of fungal and vegetal intelligence, where human thought *leaves off,* where our transcendental hierarchies can never belong, where we enter the dream-world of morphogenesis. But that doesn't mean we can't talk about it.

> The dream-thoughts to which we are led by interpretation cannot, from the nature of things, have any definite endings, they are bound to branch out in every direction into the intricate network of our world of thought. It is at some point where this meshwork is particularly close that the dream-wish grows up, like a mushroom out of its mycelium. (Freud 2010:528)

According to Darwin the root is like a brain; according to Freud the unconscious is like the mycelium. It would be remiss not to consider the poignant significance of these metaphors in the light of the more recent developments in plant *neurabiology*. The Victorian unconscious may have seemed more strewn with subterranean passages than ours, and yet the similarity between the metaphorical language of the psyche and the linguistic structure of the forest is at once easily dismissed and fascinatingly significant. Deleuze and Guattari's interpretation of Freud's mycelial metaphor states that the rhizomorph, then, is precisely '*the production of the unconscious*, in other words, that which facilitates the articulation of the unconscious.' Is this meant to re-establish the mycelium non-metaphorically i.e. really, in other words? Lacan, who said that the unconscious is structured like a language, discloses that the production of meaning in language is only made possible by metaphor, because we need *other words* in order to create chains of meaning, or signification.

Substitution of one signifier for another coincides exactly with the trope of metaphor, the displacement or 'chain' of signifiers in which the similarity of one signifier can be used to refer to another. This goes back to Ferdinand Saussure's definition of the relation between the signified and signifier as arbitrary. Saussure used the word 'tree' to illustrate the structure of language, and this arborescent arbitrariness is no mere coincidence, or rather it is a coincidence not without meaning; it is entirely *arbri*trary (Lacan 2006:416). He stated that there is no intrinsic reason why the sound of the word 'tree' should evoke the concept 'tree'. This arbitrariness means that like trees, the elements of language cannot be taken in isolation, and instead can only be determined by belonging in a (hypogean) network of relations. This understanding of language eliminated the need to fall back upon an extra-textual (extra-terrestrial), transcendental 'idea' that would precede any lingual constitution. Trees (the elements of language) only have meaning in so far as they differ from other trees (elements) within a structural network of mutual relations. The elements are constituted only in the negative, in their difference with other elements, as Derrida also points out, and yet by far the majority of vascular plants are heliotropes, so they also have this in common with our language.

In talking about the tree's place in language Saussure assumed the linguistic ability to displace the concept 'tree' from the physical tree. Is it this ability of human language to displace the word and the concept that allows us to displace the real example as well? Does the human species' exclusive appropriation of the structure of the unconscious also allow us to dominate and destroy the living, organic systems that frame language in the first place? Does language veil our vegetal reality or does it reveal it? Certainly, the structure of the unconscious bears a disconcerting familiarity with the structure of the forest floor.

The fungal species *Cortinarius foetens,* found protruding from the rotting leaves in the Tarkine rainforest, may have the shape of the phallus and yet its name is derived from the veil or curtain (*cortina*) between the cap and the stem that it uses to conceal its tender lamella, the thin hymenophore rib from which spores are dispersed. Excrescence disguising modesty: a game of seduction that comes so naturally to the shapeshifters on the forest floor. The second binomial, *foetens*, is due to the stench it emits as it rots into nutrient rich soil, being both saprotrophic and mycorrhizal. The abundance of existent life is dependent upon this complex of decay, spore dispersal and rhizomatic networking. It is even argued that the evolution of life on earth is inconceivable without this work of rot performed by fungi, making nutrients accessible that were previously locked up in hard rock. There is an irony here, the 'masculine' has so often stood for what is potent and virile, and yet when it comes to the forest floor the rotten and the fetid is what generates the fertile substrate, the humus of life. The association between potency and defiance in the face of death, 'Man' and the mastery of nature is anything but fertile; on the contrary, this alloy has generated soil-despoiling industrial farming, forest clearing for pasture lands and the increasing spread of controlled urban environments, brutally clearing away the fecundity of vegetative rot and saprotrophic fungi.

How deep a change is required in our thought processes and in our language to stop us from causing destruction of the very world that provides us with the content of our thought, that is literally food for thought that we share with the earth? Should our abusive relation with 'mother nature', not to mention the repression of our natural origin, be treated as nothing short of a clinical psychosis?

Metaphor, according to Lacan, puts a stop to the constant difference, the shifting of the signifying chain; the tree (*arbre*) crosses the bar (*barre*) and fixes meaning (2006 419). And this ability to fix meaning points back to the gap, the open place between language and reality that is nothing but the subject itself. Because of its role in raising

what is repressed and creating signification, metaphor is identified by Lacan as a symptom, albeit a poetic one (hence the creative role of speech in clinical psychoanalysis).

> This means that the most serious reality, and even the sole serious reality for man, if one considers its role in sustaining the metonymy of his desire, can only be retained in metaphor. (2006 758)

Of course Lacan would say that language in the first place can only happen because the subject has repressed the primal signifier, the phallus. If the echoes of collective unconscious stretch way back beyond 'personal prehistory', the primal signifier might be none other than the explicitly phallic *Prototaxites* (Freud *1968*:37). These 8m high fungi dating from the middle Ordovician (470 M years ago) when there were no terrestrial vertebrates, were for 40 million years by far the largest organisms around (Sheldrake 4). Do these archaic remnants continue to exert an atavistic influence upon the human psyche? Are we somehow rooted in a fungal unconscious that can't help but channel thought via the vegetal? If trees, roots and mushrooms continue to pop up as metaphor in the text of philosophy, is the 'fungal' Man's symptom, and his sole serious reality?

Mycena interrupta | Vegetal Language

There are fungal species still found in the Tarkine dating from when most of the land was collected in the southern supercontinent Gondwana. They are similar if not identical to species found for example in New Zealand, South America, New Caledonia and New Guinea: such as the bright *Aurantioporus pulcherrimus* (strawberry bracket fungus), the pretty *Mycena interrupta* (Pixies parasol), and the more subdued *Mycena austrororida* (Austral dripping bonnet). However, many of the fungi native to the *Nothofagus* rainforests have yet to be named and described, a process of considerable difficulty and potentially short duration given the corporate greed for mining profits.

The assigning of names is not a disinterested, impartial sport. While Christianity gave Adam the rights of naming, today the right to a name and nationality, given as a human right, is also an aggressively exclusionary/inclusionary device. In terms of the natural world, the universal binomial taxonomical system may have eased the identification of species, but it also creates barriers that might not be present in nature. Often in names an unintended, unconscious inference comes to play. For example, the Greek name 'mukes', μύκης (as in mycorrhiza, mycena etc), denotes the mushroom, but it also means any fleshy excrescence, or, as the lexicon puts it euphemistically the *membrum virile.* Fungi play an important role in the ecological tragedy unfolding today. Their fate may be inscribed in their name just as the tragic city of Mycene was bound to fall from its inception.[1] The house of Mycene was famed for its incestuous and patricidal tendencies, an origin story providing psychoanalysis with its vocabulary to describe psychological dramas (the Electra complex, the Orestes complex). The house of fungi, its ecology, may have been dominated by such nominally phallic dramas up until now, but now it is time to interrupt the work before it arrives at its tragic end. In the first place, an alternate etymology might turn things about. The Greek word for fungi or mushroom is close to the verb *mukaomai* (μυκάομαι) which means to roar, bellow. Do fungi roar their way into existence, a roaring outgrowth from the earth or tree? Are they now roaring at us? Hieronymus Bosch's interpretation of the listening forest (*Das Feld hat Augen, der Wald hat Ohren)* might have its real-world counterpart. Can we hear the forest roar?

A metaphorical confusion continues to prevail, one that engendered the dominating conceptualisation of 'nature' as feminine and *automaton*. On the one hand there was the female image of nature as 'wild and uncontrollable nature that could render violence, storms, droughts and general chaos' (Merchant 2010:296). On the other hand

was Descartes' metaphor of the machine describing the complex composition and functioning of the natural environment (Plumwood 104). 'Nature' as a concept was used to exemplify all that is other than man, the world without *logos*. Language feminizing nature and naturalizing women reflected and perpetuated existing tendencies of patriarchal domination. The domination and exploitation of nature and women were metaphorically and culturally analogous and sanctioned.

Just as 19th century social Darwinism interpreted nature as antagonism and violence, so 20th century Freudian psychoanalysis interpreted the origin of kinship and the conditions of human sociality as based upon exclusion and prohibition (Freud *2001*). The laws of kinship are coterminous with the order of language, and without reference to natural necessity account for the trans-generational transmission of the elementary structures of kinship. The first prohibition is, according to Lacan, the 'law of the father': the law that prohibits (No) and the name that establishes authority (Nom). Thus the child becomes the cultural subject, cut off (castrated) from nature, bound by law and the bearer of language (Lacan 1992:66-7).

> 'Then it really *has* happened, after all! And how, who am I? I *will* remember, if I can! I'm determined to do it!' But being determined didn't help much, and all she could say, after a great deal of puzzling, was, 'L, I *know* it begins with L!' (quoted in Irigaray 9)

With the equivocation of feminine subjectivity, Irigaray begins on the other side of the mirror quoting Alice's phatic remarks of her subjective absence in the system of taxonomy. An exercise in insect taxonomy (the 'rocking-horse fly') precedes Alice's equivocation, and then Alice enters the wood 'where things have no names', where all attempts at nomenclature result in the loss of nominal domination. Unlike in the case of Adam, the signifier 'Alice' lapses rather than becoming entrenched through the naming game. Falling beyond the bounds of the great projects of taxonomy (*la femme n'existe pas*), Alice finds her name elsewhere. For Alice, self-identification and species kinship are imbricated; she only remembers her name after coming into physical contact with another species, a deer who becomes her 'fellow-traveller' for a while. Alice becomes animal kin ('her arms clasped lovingly round the soft neck of the fawn') and re-embodies her own subjectivity.

That a name has meaning and one meaning only is the basis of western metaphysics' logocentrism. *Polysemia*, for something to be and not be, according to Aristotle, must always be reduced down to a single meaning, without remainder, where the difference between being and not being is an irrefutable proof ('for it would lead on to infinity' Ar.*Met.*1006a10*)*. Although, as Derrida riffs on Aristotle, the capacity to make metaphors is 'proper to man', the philosopher who has only one thing to say is 'the man of man' (Derrida 48). Unresolved identity or the question thereof, like an unfulfilled metaphor, can be said, then, to belong anywhere where man is not. Some might call this place 'nature' because what is natural is only involved in name-giving as an object of human *logos* (language/reason). There should be no doubt that name-giving is the exercise of control, futile or no. From biblical man naming the beasts of the earth and sea to the Linnaean system of double nomenclature, naming is undertaken to organise the world into different camps, if not merely two: 'nature' vs. 'man'. In Aristotle's defence we must note that he is talking about describing the identity between the name and being of *anthropos*, 'human.' It is later translations, including that of Derrida, that replace it with the limiting 'man.'

In response to the singularity of the primal signifier Luce Irigaray challenges the entry of woman into the social order as a gap in language, an absence of meaning. Her criticism of Lacan equates his generation of the symbolic order with the classical distinction that identifies woman with mute nature and man with law and language. She

claims that the maternal origin of life is repressed in favour of the masculine origin of language in which the entry into the symbolic order comes about through the paternal prohibition of the father's no/name. In order to challenge this account, Irigaray poses (human) nature as embodied and divided. This allows a relationship to open between humans and (their) 'nature', making possible living within nature and kinship between species (in Marder 41).

But Aristotle continues, stating that any argument against the unity of proof is reducible to the one and the same, and if no alternative principle is offered as the subject of reasoned argument then it is ridiculous for,

> such a person in so far as he is such, is just like a plant (*homoios gar phytoi*). (Met.1006a15)

Refusal to engage or to play by the rules of the game of logic puts one on an equal footing with plants, at least metaphorically. A solid, immoveable, alogical position resembles that of the vegetal. Today to be a 'vegetable' still means to be beyond reason, and to be in a vegetative state is to be limited to one's unconscious vital functions. And yet even reductionist science proves that plants have the capacity to learn, remember and engage in relationships. So, why is the (man-made) distinction between plant thinking and human thinking so central to the edifice of human culture? It's starting to look like a cover-up, and if so, what is it man is so keen to conceal?

According to the psychoanalytic tradition the capacity to use metaphor is what separates us from the vegetal and the animal. And yet the metaphors we employ are extracted from nature, leaving us with a language infused with a 'vegetal "substratum" of the human psyche' (Marder 137). Surely this should suggest that the very distinction between the natural and us was always already eroded. If philosophy's principle claim is to abstract thought, and yet vegetal metaphors abound, we must accept that language itself is to a large extent dominated by the vegetal. Or language itself is vegetative. Perhaps metaphorical thought finds its origin in the vegetal, or as Terence McKenna suggested, in the fungal, and human thought and language is not autonomous after all. Perhaps the vegetal is the real, or failing that, the imaginary dimension of language erupting into the otherwise anthropocentric symbolic order.

What Freud's fungal unconscious alerts us to is the entanglement between language and vegetal life. Language could not exist without the metaphorical use of the vegetal world (just as *Physics* precedes *Metaphysics).* Like fungi, metaphor provides the fertile ground, the humus, from which human language sprouts. Most fungi are saprotrophic and are the principal vegetal decomposers. They break down everything from fallen branches and leaves, to dead animals. In so doing they make the nutrients, such as carbon and nitrogen, available for other organisms. The relation between vegetal and fungal life gives us our metaphorical pedogenesis, something like lichen, a symbiosis of cyanobacteria and fungus (The Tarkine also has 'outstanding value on account of its lichen'). In Derrida's earthly metaphorics the history of a metaphor appears in the text of philosophy,

> As a progressive erosion, a regular semantic loss, an uninterrupted exhausting of the primitive meaning: an empirical abstraction without extraction from its own native soil. (Derrida 215)

At root metaphorical, there is neither writing nor thought without communicative, symbiotic pedogenesis. Soil is fertile as well as potent, simultaneously masculine and feminine. But what if language is not only rhizomatic which sounds pure and abstract, but fungal, a bit dirty, definitely contagious and hard to get rid of: Saprotrophic or

lichen-like, generating fundaments only to putrefy again, breaking concepts as hard as stone. So that what philosophy once believed was abstract has now been digested by the metaphor, becoming ‘matterphor’, breaking down the barrier between the material and discursive use of plants.

Vegetal language and radicle thought support a groundwork for a theory of a cosmic unconscious. The human unconscious has evolved from and remains part of a larger much more complex entity. In fact, it is a logical necessity that the human unconscious partakes in a more-than-human cosmology in which animals, plants, fungi, bacteria all share (minerals and water as well). Fungi are kin, but then so is everything when you start pulling things apart and go back far enough. In the light of recent discoveries of western science into our mental kinship with other creatures and organisms (from bees and bears to plants and fungi) our exclusive claim to earthly supremacy is no longer tenable, indeed it never was, and ecocide must be recognised as nothing short of mass genocide as well as suicide. The sudden blossoming of philosophical and anthropological thought directed toward the human relation with plants and other organisms is the promising if retarded result of the traditional understanding that humans are merely one part in a complex interrelated web of organic and inorganic life. It is an understanding that we come to with depressing urgency.

Amanita muscaria | Rhizomatics of Domination

Figure 3. Seana Gavin, Galactic mushroom highway. Somerset House 2019.

> … the cultural forms of Europe, linear, abstract, narcissistic and promoting of male dominance, are to my mind exactly what you would expect from a culture long deprived of the boundary dissolving, numinous encounter with the vegetable mind. (Terence McKenna)

In the Tarkine Wilderness there are 385 fungal taxa recorded, though no doubt there are more than this. In just a few kilometres from the road on the Philosopher Falls walk an incredible variety of these fungi can be seen in a vivid display of bright colours: red, blue, purple, orange, yellow. But don’t all go at once, as an exotic fungus, *Amanita muscaria,* a mycorrhizal fungus from the northern hemisphere is invading forests of *Nothofagus*. Walking tracks where visitor numbers are high become conduits into the forest, assisting the spread of pathogens and weeds, such as *Amanita*. Of particular concern is the walking track at Philosopher Falls. The road to Philosopher Falls is already blanketed in these large fungi, and it is feared they will supplant the native mycorrhizal species. The hallucinogenic, red and white spotted toadstools are here reminders that Europe introduced more than invasive species to Australia; it also introduced the European imaginary along with the limits of European thought. How can the weird and wonderful native fungi stand up against this pictorial acme of fantasy? Coincidentally, another species has also been popping up recently, the poisonous and aptronymic *Amanita phalloides* or ‘death-cap’. Also, Freud’s favourite mushroom, an edible bolete, often co-occurring with *Amanita*, has recently been discovered in southern Australia, where it too has the potential of becoming an invasive species.

The colonising spread of *Amanita* through Tasmania parallels the mushrooming illusion of technological progress and our psychological dependence upon this illusion.

> I have increasingly come to regard the mycelium as a heterogenous army of hyphal troops, variously equipped for different roles and in varying degrees of communication with one another. Without a commander, other than the dictates of their environmental circumstances, these troops organise themselves into a beautifully open-ended or indeterminate dynamic structure that can continually respond to changing demands. (Rayner, *Australian Fungi*)

Scientific research papers on fungi over the last decade use technological and warfare metaphors to describe the activities and growth patterns of fungi: the rhizomorph is described as similar to a 'multi-lane highway', while a hypha 'a narrow winding road', as if the rhizomorph already encapsulates a more advanced system to the simple, bucolic hypha. Again a rhizomorph is 'equivalent to landing an army division in enemy territory,' whereas hypha is 'equivalent to landing only a small squad of soldiers in the same hostile territory.' Given that interactions between organisms are no longer being conceived exclusively as unmitigated conflict and competition, but rather as symbiotic and intelligent, we have the freedom to make fundamental changes as to how to place ourselves and engage with our embeddedness in the world. And yet, while we are emerging out of the bias towards industrial progress, the pull towards characterising nature as mechanistic remains strong.

The mycologist entrepreneur Paul Stamets', coined the term 'Earth's natural internet' and others, when trying to convey the significance of the discovery of the extent and inter-relationality of the mycorrhiza, compared the mycelium to a 'network', employing the phrase 'wood wide web'. Not only does this serve to mechanise, or rather digitise, fungi, it also has the reverse effect of naturalising the internet.

The mechanistic metaphor serves to disguise and evade the potential similarity between vegetal and human intelligence. Fungal intelligence can be considered closer to that of a computer network, physically composed of 'circuits' rather than 'synapses' and 'neurotransmitters'. It also reveals the extent to which humans are alienated from ecosystems, where networking platforms are more familiar than the rhizomes in the soil. That the World Wide Web has its natural predecessor habituates us to the acceleration of networks being rolled out worldwide. Is it too wild to suggest that there is some kind of atavistic attraction that draws us to the internet, because its structure reminds us of our prehistoric fungal ancestry and the forests we left behind?

Just as mechanistic metaphors used by authors of the 17th century helped to inure humanity to the advance of machines and industrialisation, so today biophysical network metaphors are inuring us to a system of bio-surveillance and bio-control. Otherwise alienating developments are framed as natural processes, alleviating new technologies and systems of their alterity, and grounding them in a metaphorics of vegetal plasticity and connectivity. Following on from Deleuze and Guattari's 'rhizome', contemporary theory finds a refuge from the no-way out of challenging systems theories by resorting to rhizome as a polysemous metaphor of indeterminacy, assemblage, chaos and rebirth (Tsing). But to accept the indeterminacy and precarity of life on the edge of a capital-induced climate emergency is not enough. We must change more than our narrative to protect the remains of our old growth forests. The notion that it is essential to the philosophical tradition to use metaphors to restructure the grounds of thought, even if that means digging up the arboreal hierarchies and supplanting them with transversal rhizome-thinking, should not be separated from the current dominant activity of literally tearing up rainforests in search of the resources required to create new devices and systems of interconnectivity.

> make rhizomes, not roots, never plant! Don't sow, grow offshoots! (Deleuze and Guattari 24)

Are Deleuze and Guattari inadvertently condoning the clearing of rainforests and the cultivation of hectares of rhizomatic couch grass for animal fodder? What if new thought-networks encourage other advances beyond the philosophical, such as technological developments that require too much in the way of ecological sacrifices? What if this new way of thinking in rhizomatic assemblages allows rising models of interconnectivity, the domination of the World Wide Web over actual inter-personal relations, the rise of manipulated global flows of thoughts, but also of people, moving and travelling, of goods or bads (GM foods, pharmaceuticals, vaccines) to intersect in a heteronomous mix between cultures and places, and a new global order that is even more heavily reliant on natural resources despite any amount of green washing. This interconnecting web offers only a virtual ecology, while actively involved in actual ecological devastation. What if new discourses of interconnectivity,

> open the door to perhaps more insidious modes of domination. This is especially the case with environmental discourses of ecology, which often valorize an open concept of complete rhizomatic interpenetration and connectivity, without considering how vectors of category transformation may infect the body politic with yet undreamt of viruses of biopower. What I call the *rhizomatics of domination* are the shifting configurations of (bio)power that capitalize on ecological understandings of relationality and kinship. (Mikulak)

Today we are all facing the serious threat of spreading biopower and biosecurity with increasing personal surveillance assisted by rhizomatic communication networks that we allow to impose themselves into our most intimate spaces, linking us all in an assemblage of data and diagnostics. If, as Edward Snowden stated, human emotion is viral, then we should beware the spread of mass fear and its reciprocal emotion, blind faith in technology's ability to provide safety. There is no quick, tehno-fix for existential anxiety, though it might seem desirable. If we keep dreaming about tech companies putting out the fire, we might wake up too late to save the burning forest.

Fungi prompts thoughts of symbiosis and interspecific mutualist communication; a healthy combination in comparison to the consumptive thought we are used to engaging with. However, there is no doubt that both the scientific research into symbiotic relations and vegetal communication as well as the sociologies and philosophies that ensue are not only being taken up by ecologists. It would be naïve to think that a system as evolved as neo-liberal stakeholder cartel-capitalism would not seek to absorb such knowledge into its structures of power. Venture capitalists are already on the uptake. Carbon-producing fungus (as opposed to oxygen-producing trees) is now touted as the alternative to everything, from furniture and building material to geo-engineering solutions to climate change. Psilocybin is now being manufactured and administered in hospital settings as a drug compound to fight depression induced to some degree at least by the distortion contemporary culture demands of its human subjects.

Under the guise of nature, technology is presented as the solution to the problem created by advanced technological societies. It doesn't matter what colour it is painted, advanced technologies are heavily resource dependent. And the societies they support are societies heavily dependent upon advanced technologies, promoting tech companies to the position of god, with the power to give and the power to take away. At present, corporate interests dominate the narrative of environmental crisis mitigation and ecosystem regeneration, unsurprisingly promoting consumption as a solution to the consumption crisis. We are being sold biotechnological systems of control and manipulation that generate further social inequities and trespasses on dignity (human,

animal, plant, geological formation, bacteria), obliterating wild organisms altogether. Ideas of natural association, privileging virtual freedom of movement, flexibility and precarity are lifted wholesale into the biotechnological arena obliterating our ability to practically move freely. This is not a danger-free enterprise. Systems of biotechnological control are proliferating. For many, various examples are within their homes, in their hands. We can now look back at Foucault's panopticon and laugh at its naivety. Who needs a panopticon when the regulating device is installed on or indeed in the body? Or when the powers of control have so totally saturated the outlets of information and knowledge acquisition that any conceivable alternative is simply unimaginable?

If Freud used the mycelium to articulate the unconscious, giving rise as it has to the subsequent horrors of modernity, from behavioural psychology to psychiatric pharmacology, then what of plant roots and fungi being used to articulate our brain (and vice-versa)? Can this be used to justify an analogous use of growth hormones and genetic engineering in both plants and brains? Fungi, especially those with hallucinogenic properties, have stood as a symbol for disconnection from constructed cultural systems and reconnection with the diverse enormity of cosmic being, and although it has taken fifty odd years, fungi are now at risk of being absorbed into the machinations of capital and systems of control. While changing the dominant narrative from nature as mechanistic to nature as mutualisitic symbiosis is intrinsic to reinvesting humans in a relation with the natural world, human language and the project of philosophy alert us to the fact that we never actually abandoned 'nature'. Fear that the relation has been lost only reinforces the call towards technological developments that claim to alleviate the existential anxiety of being at a loss in nature.

Guattari's ecosophy makes the claim for a threefold change (environment, social relations, human subjectivity) if human relations with 'nature' are to cease being driven by the destructive bent of capital (Guattari 2000). However, his actual essays are surprisingly devoid of the vegetal, firmly located rather in the social terrain of mass media and international politics and trade. Ideas of sociality and subjectivity either need to be expanded to include the nonhuman, not only animals, but plants, fungi, bacteria and (why not) rocks as well, or abandoned in favour of some other kind of multiple symbiotic subjectivity, where we can't take antibiotics for fear of harming our sensitive communities of microbiota. From this perspective traditional political forms of reform and resistance seem not only outdated but also ecologically myopic. The Euro-British political contract exported throughout the world can never be expected to answer to anything beyond corporate interests (once the East-Indies company, now Microsoft and so forth). It doesn't matter how ardently we long for ecological integration; if we are reliant on technologies controlled and censored by big tech to spread our message, our means will always defeat our intentions. The only way to express ecosophy in earnest would be to prove through real, actual social and ecological engagement that such mediations are unnecessary, thereby cutting off dependency upon and profit for the technocracies that produce them and desecrate our immediate and distant environments to do so.

> How do we change mentalities, how do we reinvent social practices that would give back to humanity - if it ever had it - a sense of responsibility, not only for its own survival, but equally for the future of all life on the planet, for animal and vegetable species, likewise for incorporeal species such as music, the arts, cinema, the relation with time, love and compassion for others, the feeling of fusion at the heart of the Cosmos? (Guattari 1995:119)

But it is not responsibility that we should ignite. We're not responsible, we're not authors of this destruction. As Morton points out, no single human is responsible for the anthropocene (though I personally can think of some names that would be pretty high on the list) (Morton 2016: 8). It's not a matter of accepting responsibility in order to

change. Rather we need to give up responsibility and stop the drive for ever-increasing productivism and progress. We need to disengage and retire into the 'feeling of fusion', keep it simple, relax and listen to the forest to sow the seeds of the future, rewilded and rewilding with as much species variety as possible.

Chalara australis | Save the Tarkine

Meanwhile, in the Tarkine logging and mining continue (despite constant efforts by ecologists) bringing in more visitors, opening roads and increasing the risk of wildfire, insects and diseases, as well as noxious fungal attack. *Nothofagus* forests are particularly sensitive to wildfire; unlike Eucalypts *Nothofagus* does not regenerate so easily after fire. And these disturbances leave the trees open to the fungal pathogen *Chalara australis*, a disease that is fatal to trees and leaves them susceptible to attack by the Platypus pinhole borer. Quickly, the drier environment wins out, devastating any hopes of regenerating the same conditions, let alone the same species that inhabited the once species-rich rainforest.

The vegetal provides us with food for thought. So why on earth do we insist on desecrating the fruit bowl of our consciousness? The emphasis should no longer be upon protecting the small patches of wilderness that remain, but on enlarging them to encompass as much of the globe as possible. Including us. Without forests the fungi cannot thrive, the remaining trees will not thrive, but will they also be devoid of thought? And if we deprive them of their food for thought, do we simultaneously deprive ourselves? We literally cannot think about living without plants.

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Notes

1. My thanks to Dianne Chisholm for drawing my attention to the playful etymological proximity between the Greek *mukes* and the tragic Mycene.

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