

Animal, Vegetable, Mineral: Ethics as Extension or Becoming?

The Case of Becoming-Plant

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Part One: The Diagnostic: “The First Animal After Humans”

Our initial, wide-angle orienting claim is that Western philosophy has been dominated by the question of Being. That the question of Being dominates means the dominance of a particular subset of philosophical answerings. It demands the kinds of answers that tell us *what things are by nature* and *what things are not*, and subsequently how the answers to these two questions can be compared and arrayed in logical, conceptual, temporal and material series: in pairs and relations of resemblance and dissemblance, one to another. Gilles Deleuze and Félix Guattari call this conception of relationships “analogy of proportion” or “series”: “For natural history conceives of the relationships between two animals in two ways: series and structure. In the case of a series, I say *a* resembles *b*, *b* resembles *c*, etc.: all of these terms conform in varying degrees to a single, eminent term, perfection or quality as the principle behind the series” (1987: 234).

Mapping these relations (empirically, conceptually, logically) has become what is known as *knowing*. And this version of knowing dominates epistemology. Furthermore a preoccupation with the question of Being entails the dominance of a particular theory of value and selects a subset of normative principles: *functionality* and *teleology*. What *a thing* is good for, and whether it achieves the ends for which it was designed, intended or is capable, have become the chief modes *and* sources of value and meaningfulness. The current debate about pain in lower animals is a

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beautiful example which showcases the dominance and mutual scaffolding of these very framing principles: What *is* a mollusc? Something above a sea cucumber but below a dolphin. How do we know a mollusc feels pain? By inference from our own pain states and pain behaviours + scrupulous empirical evidence. What is wrong with pain anyhow? It stops us, and presumably molluscs, from doing the kinds of things that make our (human, mollusc) lives worthwhile, i.e. working, philosophizing, *molluscking*.

A second claim approaches, obliquely.

In the course of the past thirty or so years, an enormous quantity of work in philosophy—especially ethics and philosophy of mind—has been devoted to remedying an ostensible lacuna in Western philosophy: the exclusion of the animal. While I have certainly participated in that labor, for the purposes of this paper, I strenuously resist taking it up again. I do so with an initial three-fold gesture.

First, thinking-the-animal is not, in fact, missing from but rather saturates Western philosophy. The tradition has certainly posited, and inserted, an abyssal difference (Bataille, 1992) between the human and the animal. One need only recall the polemical Cartesian claim in *Discourse on Method* that animals are mere clocks. But, what is much more interesting and subtle to notice is that the same tradition has created and sustained for animality a unique proximity to the human which is especially *non-abyssal*. From antiquity through to the present, the concept of “the animal” has played the lead and proximate role for marking, conceptually, what differentiates “the human” being from every other being. Consider this common refrain:

Dolphins have been declared the world’s second most intelligent creatures after humans, with scientists suggesting they are so bright that they should be treated as ‘non-human persons.’ Studies into dolphin behaviour have highlighted how similar their communications are to those of humans and that they are brighter than chimpanzees (Leake, 2010).

“The animal” has been perennially conceived and deployed in philosophy as what-we-are-not: *the* non-human. Efforts to conceive or to know or to express the animal through, or adjacent to the human, or, to conceive or know or express the human through, or right next to the animal—through the genius of analogy, resemblance and of teleology, through form and function—has produced a very stable, hierarchical scaffolding with *the animal*—like the ontological family pet—always there, right beside us, if a little lower. This is because Being and Animality are inseparable.

Perhaps this on-going privileged placement has been “good for animals”? In general, no. Not when one squares up to the facts of loss of habitat and species, of industrial meat or zoos and the lives of billions of lab animals. Sometimes an extraordinary member of a type gets noticed and receives a better life and some notoriety: Lassie or Kisi the grey parrot or Kanzi the Bonobo. But even here, the best these exemplars can do is place a strong second to us, as they also tend to do in “lifeboat ethics” scenarios favoured among moral philosophers. Even among some of the heroes of animal moral standing for animals we find this ranking happening. For instance, after a long and careful working out of the equal inherent value of all subjects-of-a-life, and the equal *prima facie* right of animals not to be harmed, Tom Regan states rather baldly, “Death for the dog, in short, though a harm, is not comparable to the harm that death would be for *any* of the humans” (Regan 1983: 324, added emphasis). He declares that this outcome is not in conflict with the principles he has worked hard to ground, and then goes on to do a fancy bit of utilitarian shell-gaming to make that ranking stick. Peter Singer practically guffaws at the attempt to level the moral playing field beyond subjects-of-consciousness, declaring outright: “...and we can pass silently by [Paul] Taylor’s even more extraordinary claim, that we should be ready not merely to respect every living thing, but that we should place the same value on the life of every living thing as we place on our own” (2002: 319). In making this gesture, I am hoping that what catches our attention for a change is not the strength or weakness of these arguments but the propensity of our “animal heroes” to deploy them. And, the fact

that humans come out on top even among those claiming the least degree of comfort with that very outcome and publically committed to changing it.²

Has this thought scaffolding been “good for other forms of life,” or could it be, if we keep trying to extend ethics in the direction of, say, invertebrates and green things, i.e. plants? No. Plants—just like the notion of “the environment”—have certainly been relegated to vague background roles or “milieu.” Except for Aristotle, they have rarely appeared in three millennia of thinking and writing Philosophy. We live out that gesture of our minds, in our imaginaries, in our everyday set-ups. Just think about your typical natural history museum visit: The giant *Equisetum spp.* (aka horsetail, snakegrass), the lush ferns and the freaky angiosperms are the hundred million year-old leafy props against which the drama of the dinosaurs and Stone-Age man, and then the Woolly Mammoth and its disappearance, plays out. And is being replayed. Both in the stories restoration biologists are telling about *which* moment in prehistory is the ecologically-correct one to “return to,” and in the mammoth (literally) fantasies about the time before-humans literally under construction by rich industrialists in the 21st century (Lovgren, 2005).³ Notice that the animal again, even in the historical misanthropic imaginary, sits right next to us. Notice that we are able to see, and are willing to be shown, that we humans start as alligator-like creatures crawling up out of the Devonian mud, from water to air, our musculatures and genes evolving, yet still trailing out behind us into the fan-shaped Kingdom *Animalia*, back through the reptiles and the birds and those great dinosaurs. That is what we are willing to see as our actuality. And though we know, intellectually, that we always have and always will live by grace of the oxygen produced by said plants, and are built from the very carbons of them, and run our entire global economy off the backs of that carbon, we are unable to think let alone live the novel and profound truths of *these* vegetal relations. This backgrounding of herbality—indeed of ecology—is directly linked to the foregrounding of animality. It is a gestalt operation (Zwicky, 2003).

² For a further exploration of this tension in contemporary art on animality, see my (2010) “Infinite, Indifferent Kinship.”

³ See also Matthew Chrulew’s article in this issue.

One final gesture, a confession: I don't really *love* animals. I love philosophy. My question is this: Have these efforts of thinking-the-animal been good for thinking? In general, no.

The animal-as-non-human does not belong to a sad, myopic and ameliorable moment of Western philosophy's past. It is central to, and constitutive of that past: thinking-the-animal plays a critical and an exclusive role in "onto-stabilizing"⁴ a certain version of human life, including what questions and answers humans come up with while thinking, and the overall style of that activity. And, it will likely dominate the character of thought's future, even in domains far from "animal philosophy" for we are speaking here not of the content of thought but of its very architecture. The saturation of Western philosophy by animality has worn a rut in occidental ethical and political thought, causing what I call a "mental-stereotypy": the repetitive, ritualistic acts of binary judgment and the extension of categories outward from a prototype.⁵ Thinking the animal seems to have not caused us to take up the difference that difference can, and should make, to "inherited thinking, its presuppositions and its dogma" (Derrida 2003: 122). Jacques Derrida is certainly right that,

...it is a matter...of taking that difference into account within the whole differentiated field of experience and of a world of life-forms. And that means refraining from reducing this differentiated and multiple difference, in a similarly massive and homogenizing manner, to one between the human subject, on the one hand, and the nonsubject that is the animal in general, on the other... (2003: 128)

But, he seems to have underestimated the difficulty of getting to that "whole world of life-forms." He himself got stuck on cats (2008) and meat (1991). In their remarkable eighty page plateau on "Becoming" in *A Thousand Plateaus*, Deleuze and Guattari caution us that "[b]ecoming-animal is only one becoming among others" (1987: 272). One can, "in no preformed logical order" (251) apparently "encounter becomings-woman, becomings-child... taking it from animal, vegetable, and mineral becomings

⁴ I would like to thank my colleague, Doug Halls, for helping me to articulate this complex dynamic.

⁵ <http://en.wikipedia.org/wiki/Stereotypy>

to becomings of bacteria, viruses, molecules and things imperceptible” (248). But, in truth, that plateau is overrun by dogs, wolves, birds, cats, horses, whales and tics. And they confess to believing “in the existence of very special becomings-animal traversing human beings and sweeping them away...” (1987: 237). Animal-thinking, even in radically unconventional thinkers, seems to block rather than enable “acts of understanding performed with *the maximum perspective possible*” (Naess, 1977, as cited in Hurley, 1988: iii). Why? Because animality has an assured berth deep within the very structures of thinking, imagining, feeling, desiring. What would it take to actually think-otherwise, to truly think *ecosophically*? Might we be able to think-the-plant and avoid (re)onto-stabilizing ourselves? Might some aspect of herbivory help us to have a new thought without our domesticating them, and thought, in turn?

Part Two: *Making Heads or Tails of PLANT PHILOSOPHY*

There are not many of us doing vegetable philosophy, either professionally or casually. What *could* philosophical botany be? Here is one possibility:

Richard Karban, a leader in the field of plant communication research, wrote in a comprehensive literature review in 2008. His philosophical position is that it is both empirically and conceptually incorrect to say plants “react” whereas animals “behave.” That, like humans, animals “behave” and do not simply “react” is, as we know, one of the key axes of extension that animal behaviour science has pursued in the past 30 years. This is what Karban writes in support of a further correction and extension of that concept, to plants:

Plant behaviours are defined as rapid morphological or physiological responses to events, relative to the lifetime of an individual. Since Darwin, biologists have been aware that plants behave but it has been an underappreciated phenomenon. The best studied plant behaviours involve foraging for light, nutrients, and water by placing organs where they can most efficiently harvest these resources. Plants also adjust many reproductive and defensive traits in response to environmental heterogeneity in space and time...Plant behaviours have been characterized as simpler than those of animals. Recent

findings challenge this notion by revealing high levels of sophistication previously thought to be within the sole domain of animal behaviour. (2009: 727)

There are other forays of this kind (Hall 2009; 2011; Stone 1974, 1985). While part of me applauds these efforts and takes a great interest in the power of the data and the arguments being launched, another part of me recalls the gestures I made above against extensionist efforts. Recalling those gestures, we already know that the project of bringing plant life into the existing philosophical conversation is exactly that: a project of engaging philosophy on its classical terms and subjecting “the plant” to those terms—terms of resemblance, difference as degrees from similarity of function, relevant functions and their relative value anchored by “the human” and of hoping, as was the case with the animal, to find a common ground and a “common logic between these two kingdoms” so that plants, now, too, can be *taken seriously* (McCourt, 2005). And we already know with a high degree of confidence what the conceptual and material outcomes are of this line of thinking will be: for the status of plants or other features of the natural world, in thought and in action (third place), for the status of *the human* or *person* by comparison (victorious) and for likelihood of the enriching of philosophy under the pressures of this herbivorous line of extension (weak). Since my overall concerns are *ecophilosophical*; that is a desire and a commitment to think and to exist beyond any particular kind of animal or thought or plant, to think and exist adequately (Spinoza, 2000) within the intactness, beauty and vitality of life, then we need to imagine another route for plant-thought.

2. Becoming, and Becoming-Plant?

Whence might another route lie? In principle, we would have to aggressively bracket the question of Being and try to orient toward concepts like *Becoming* and *Unbecoming*.

Serendipitously, one discovers the concept of *becoming-plant* in Deleuze and Guattari’s work, and finds it vastly underthought in Deleuzian studies. Crucially, the

concept isn't *about plants* but about becoming. Let's briefly outline what Deleuze and Guattari mean by the concept of becoming.

Two very helpful and concise statements they make are that, "becoming is a verb with a consistency all its own" & "becomings are another power" (239). A becoming is not a description of an actual or ideal property or feature of an entity so much as a description of an altered, scalar intensification—the taking on of certain relations of movement and rest" enabled as it enters "a particular zone of *proximity*" (273) with another, in a particular way. Crucially,

a becoming is neither one nor two, nor the relation of the two; it is the in-between...the block of becoming that unites the wasp and the orchid produces a shared deterritorialization: of the wasp, in that it becomes a liberated piece of the orchid's reproductive system, but also of the orchid, in that it becomes the object of an orgasm in the wasp, also liberated from its own reproduction (293).

Becoming is the name for this provisional co-creative zone in which the "parties" and their "proper functions" are themselves effaced and augmented.

Deleuze and Guattari name different kinds of becomings. What is involved in these different types? They tend to explain becoming in general through the example of becoming-animal. Does it have anything to do with actual animals like North Atlantic Right Whales and Snakes? Are we to put on snouts and bark convincingly? No. Do we put on fins and learn to free dive? Perhaps. Whatever these becomings involve, according to Deleuze and Guattari, they do not involve or lead us back onto finding their proper relative morphological positions along the Great Chain of Being by way of likeness and unlikeness: "Do not look for a resemblance or analogy to the animal, for this is becoming-animal in action, the production of the molecular animal (whereas the "real" animal is trapped in its molar form and subjectivity)" (275). Neither do becomings involve imitation or even conceptual proximity:

An example: Do not imitate a dog, but make your organism enter into composition with *something else* in such a way that the particles emitted from the aggregate thus composed will be canine as a function of the relation of movement and rest or of molecular proximity, in

which they can enter. Clearly this something else can be quite varied, and be more or less directly related to the animal in question: it can be the animal's natural food (dirt and worm), or its exterior relations with other animals (you can become-dog with cats or become-monkey with a horse), or an apparatus or prosthesis to which a person subjects the animal (muzzle and reindeer, etc., or something that does not even have a localizable relation to the animal in question (274).

Neither does becoming mean functionality. It is not about accomplishing something types tend to accomplish *by nature* or hope for, like acting autonomously or making babies. The “production of the molecular animal” (275) means the intensifications of a *zone* or *bloc* of connectivity—proximities but not spatial, nor temporal nor even conceptual adjacencies—toward a particular configuration of movement and rest which *expresses* but does not *represent* a quality or qualities of animality, of animal-livings. This is crucial. Notice that the key features of extensionist moral thought discussed above—proximity as seriality and adjacency, analogy, resemblance and functionality—are antithetical to *becoming*.

And what, then, of *becoming-plant*?

In principle, *becoming-plant* would involve our extension and ideas entering into composition with *something else* in such a way that the particles emitted *from* the aggregate thus composed will *verb vegetally* as a function of the relation of movement and rest, or of molecular proximity, in which they can enter. Becoming-plant is the emission of particles from a heterogeneous alliance we make which expresses in action the unique qualities of plants or plant-lives. These qualities would, in principle, not be the same qualities as those of women or women-lives, nor of canines, nor of children and childhoods. Very little attention has been devoted to imagining what these unique expressions of plant-livings might actually be. This should strikes us as unfortunate if indeed different becomings are philosophically unique; that is to say, express unique logics, phenomenality, conceptualities, imaginaries and values, and enable us to “enter into” proximity with a genuinely different range of thoughts and bodies.

In the final section of this paper I begin to try to articulate the unique bloc of *in-between* expressed by the phenomenon of plant communication. Besides plant communication, there are at least six non-superficial ways that plant-life differs from the lives of all other members of the kingdom animalia, whether “a snake or a codfish, or even a bee” (Midgley, 2004: 49): 1) in rhizomes alone, a capacity to form new growth at any point along its body; 2) extreme seasonality of viable reproduction; 3) the great distances in time and space, and the elemental forces of water, heat and wind that reproductive and nutritive parts must navigate to realize their teloi; 4) the immediate triggering of cell-death upon successful pollination; 5) the presence of four axes of symmetry: radial, left-right (bilateral); front-back (adaxial-abaxial) and up-down; 6) the presence of male and female parts on the same organism.

My work here is not intended to establish a truth about *plants in general*; about how the secret life of plants is cool; about how plant life is like or is not like human life, and to what degree; or even in the service of the concern that plants deserve moral standing. This work aims to make evident that these vegetal modalities express genuinely different, rather than nifty *vegetal-variation on*, our dominant modes of enacting communication and our dominant ways of thinking about what communication is and is in the service of. Ideally, we want becomings to resonate not just to be understood. My hope is that what is presented enters into composition with *something else*—perhaps inchoate but resonant *vegetality mental or somatic experiences*—and frees the powers of thought, even provisionally, from the bad habits it has developed through (over)thinking-the-animal, to another power.

3. Becoming-Plant-Communication

Research into plant communications (also called “plant signaling”) began in earnest in North America around 1983. Since then, there has been an explosion of research and peer-reviewed articles into the subject, appearing in every major scientific journal. All my sources for this paper are from work published in the past two years. The actual methods of collection of plant signaling data, and the subsequent discussions of the results, have been framed by a predictable set of expectations and a predictable

underlying ontology: teleology, functionalism and Being. Those ontological premises are revealed by these (typical) Q&As about plant signalling:

1. *What* actually happens? Plants have a “volative profile” (“VOC”) which is a kind of chemical fingerprint made up of possibly hundreds of different chemicals which it gives off in a resting state, and, when a plant is stressed (it is being eaten by bugs like aphids, or encroached upon by couch grass, or shaded or thirsty or even mechanically damaged) its volative profile changes.
2. *What is it?* A plant’s immune response, since the new volatile chemicals attract natural enemies to the bugs that are eating it or the weeds that are encroaching upon it.
3. *Why* would a plant “communicate”? In reaction to an alien invasion, as a protective mechanism. This chemical shift comes at an energy cost to the plant, so even if the individual plant is sacrificed, the mechanism serves to increase the reproductive fitness of its type: kin selection.
4. *Which direction* does signaling move? From the inside of individual plants, and outward according to the natural law that “requires it to grow and develop itself on all sides, according to the tendency of the inward forces which make it a living thing” (Mill, 1956: 72).
5. *Where* does communication “happen”? On the surface of the leaf and flower cells by virtue of chemicals which have travelled through the air toward it.

If we stopped here those of us unfamiliar with this phenomenon might go away surprised and impressed by the fact that plants have a “self-defense system” (Karban and Shiojiri, 2009) and a capacity to communicate.

But, consider the following summary statement by two leading scientists in the field, Martin Heil and Richard Karban:

...there are theories at hand that could explain the evolution of emitting airborne signals but there is a lack of empirical data to test them. It is known empirically that plants can perceive VOCs but there are no theoretical models to understand the evolutionary origin of this capacity, neither is it known how volatiles are perceived and translated

into signals. Even after accepting plant–plant signaling via airborne cues as a physiological possibility, many researchers have doubted its ecological relevance... (2009: 142).

Clearly, there is more of a mystery afoot than the question-and-answer session above, suggests. In the next section I am going to walk us through six observations which contribute to Heil and Karban’s view. I will identify the starting (ontological) premises and then state what I think is a more viable premise as is implied by the observation. Taken together, these facets express a quality of the unique becoming that is becoming-plant.

I. At the level of “the individual” plant, and communicating outward?

There are two pertinent observations which contest the view that plants are isolated types reacting outward to other plants.

First, it turns out that the chemical profile of a plant is often totally unique to *that individual plant*. There does not seem to be a simple or generic “chemical fingerprint” for, say, barley or corn in general. “All plants release volatile chemicals, and the chemical profile from different plants is different and can be specific to that plant” (Dewhirst and Pickett, 2010: 89). This observation complicates the basic assumption that, in signaling, a plant is acting as a genetic *type*.

Second, even a given individual plant’s volative profile changes in different ways depending on what kind of stress it endures: if it is mechanically attacked it gives off a “wound signal;” if it is attacked by an insect, another type of signal; and if another kind of insect, yet another type of signal (Dewhirst and Pickett 2010: 90). This forces us to imagine not only that plants are individuals, but that these individuals are continuously co-evolving *with*, and *in*, varying environmental relations which themselves are evolving in complex ways. Plants are not in any meaningful way beings in isolation from an externality which is configurable as secondary or alien,

toward which they must move, and against which they need immunity.⁶ So-called generic types are real individuals, and those so-called individuals are always already *in* and with *fluid non-additive relations* (Cahill et al., 2010: 1657) with others. These observations put pressure on the possibility that individual plant organisms are embedded singularities or put otherwise, that the most real and basic indivisible unit (or body) of finite vegetal existence are what Spinoza called “modes,” “particular things that actually exist” (Spinoza, 2000: Part II: Proposition 9)—each with its own nature—rather than types or essences (Part II: Definition 1-7), and that these singularities are, by necessity, fully immersed in, constituted by, and constituting, a milieu. “The interplay between plant and environment is a mutual activity” (Willemse, 2009: 2397).

II. Communication among blood relations?

Across dozens of examples (Heil and Karban, 2009: 138) we see that *one kind of plant* (“plant A”) experiences one kind of stress (“stress X”), and its VOC signals to an *entirely different (genetically unrelated) kind of plant* (“plant B”) which enables the second plant to do something which improves its success: mount a defence against some further kind of stress (“Stress Y”), defences as spectacular as the augmentation or “inhibition of the germination or the development of plants” (137), including stem, leaf or root development (Preston, 2004: 912). Here is a typical example of the structure of such a mechanism: *Sagebrush plants are cut. They give off a volative chemical. This induces resistance in wild tobacco to grasshoppers and cutworms* (Heidel et al., 2010; Karban et al., 2000). Conceptually, we are already talking about communication between neighbors and not kin, not blood/sap relations. These inter- rather than intraspecies’ signaling mechanisms still go by the name “plant-plant signaling” but change the story we can tell radically. “Data from at least two systems...demonstrate that being related is *not a prerequisite for communication*” (Heil and Karban, 2009: 142, added emphasis).

⁶ One can see here that the major liberal trope of negative rights has been read into the dynamics of plant interaction.

III. *Between Plants: Dyadic Mutualisms?*

What I have just underlined about inter-plant relations is nothing new from an ecological perspective. Ecology does not begin with the presumption of individuals or isolated species but rather with sets of context-specific life forms that have co-evolved into a variety of partnerings: *predator-prey*; *mutualist*; *commensalist*, *opportunist*. These name the various combinations and permutations of benefits and costs across a given non-related pair. Explanations for Plant A: Plant B-type interspecific signaling default to the presumption that these are mutualisms. Hossaert-McKey et al. weigh in: “As in many other interspecies interactions, chemical signals are suspected to be important in the functioning of these mutualisms” (2010: 75). Mutualisms are cooperative interactions between species, in which each partner benefits from the association (Bronstein et al., 2006).

Let us focus on the especially-beloved Deleuzian proposition *between* (Villani, 1999: 9) and the premise of *partnering* in the prototypical mutualistic case that Deleuze and Guattari describe: the orchid-wasp pairing. The flowering plant “offers” the insect a place to lay its eggs, and a ready-to-hand snack when the larvae hatch (the fruit, the seeds). The insect “offers” the plant dispersal of pollen, sometimes directly and sometimes indirectly through further “parasites and predators associated with these mutualisms” (Hossaert-McKey et al., 2010: 75). Whatever the mechanism, it is said that “...each partner depends directly on the other for its reproduction” (75). In some cases “these mutualisms are quite specific: each partner depends exclusively, or at least partially, on the other for its reproduction, enforcing tight physiological co-adaptation...Plant and pollinator have evolved extraordinary reciprocal specificity, often approaching one-to-one obligate specificity” (76). What these assertions suggests is that, even though plants, insects and animals *are* parts of larger, complex and dynamic blocks of ecologic vitality, nevertheless within that larger whole there are tight (exclusive, monogamous, dyadic) couplings. Ultimately, here, the dyad is conceived *as if* it were an isolated individual, and the pairing itself *as if* having the most central and identifiable function within that whole: a pairing in perpetuity.

Again, delving into the details of these so-called *pairings* suggests that whatever is going on *between* plants is neither so *exclusive* nor so simple to sum-up. For how, exactly, are these ostensibly exclusive dyadic offerings even made to one another, and such couplings cemented?

By a third.

In many cases that third is a “flower volatile,” a chemical signal. A perfume! Studies of the chemical profiles of these signals reveal a mind-boggling array even in a controlled environment like a greenhouse where one manages only a few species, not entire natural ecosystems. A flower volatile is by no means a one-note info-spritz aimed directly at a single wasp but something almost unfathomably complex both in what it is and what it does. First, the “scent signal emitted by the host plant must be specific, to attract its specific and obligate partner” including a way of acting during “the appropriate phenological stage for pollinator visit” (Hossaert-McKey, 2010: 76). The *perfume* emitted by the host plant and perceived by the insect should contain not only information about the specific identity of the plant, but also on its developmental stage, particularly information about whether or not the plant is receptive, i.e. ready to be pollinated and thus has the right resources to offer. And, these so-called *partners* are not just hanging around the house waiting for the phone to ring: they are dispersed, and plenty of other possible suitors are nearby. The successful encounter of the host plant and its mutualist insect therefore also requires a very strong signal. And so, as a second requirement, “the signal emitted by the plant and the capacity of the insect to detect the message...must be strong and precise enough to extract “signal” from “noise” (Raguso 2003, as cited in Hossaert-McKey, 2010: 76). There appear to be hundreds of possible dimensions to the accomplishment of the coupling by the third. Scientists confess: “The transfer of information about resources opens up a large number of questions. How is specificity of the signal achieved? Moreover, once specificity is achieved, how do plant–pollinator relationships change, how do they diversify...as increasing numbers of associated species adapt to exploit the resources exchanged by mutualists, are mutualist pairs that are locked into a simple signal unable to shift, whereas those that use more complex signals can respond more easily to such pressures? Could it be that if they appear, simple-signal systems may

relatively quickly disappear, rather than leaving descendant lineages?” (Hossaert-McKey, 2010: 85).

What I think we learn here is that the default story of mutualisms as dyads underplays and oversimplifies the truths of the critical sophisticated and still-largely-not-understood agency of other elements, in this case an organic compound. Whatever is going on *between* two plant partners is neither so simple, nor so *between*. These simple perfumes “may be the ‘silk’ that holds together the complex web of interactions...” (85). The third qualifies, as much as the pair, as an *agent* or what Bruno Latour called an *actant* in a complex interaction—“*a parliament of things*” (Latour, 1993: 142) not merely as a vehicle for the interaction of a couple: “...as soon as we stop taking nonhumans as objects, as soon as we allow them to enter the collective in the form of new entities with uncertain boundaries, entities that hesitate, quake and induce perplexity, it is not hard to see that we can grant them the designation of actors” (Latour, 2004: 76).

IV. Still Other Others: Alliance, not Filiation

Our narrow view of so-called individuals and so-called dyadic mutualisms opens wide when we pay attention to the fact that, “...plants manage simultaneous interactions with diverse organisms” (Preston, 2004: 913): insects, fungi, animals, birds, single-celled organisms, other plants. Draw from hundreds of possible examples, here are four well known non-dyadic systems with alliances *across kingdoms*:

1. There is a beetle larva that eats maize. When attacked by these beetles the root systems of the maize emits a chemical which attracts a nematode. This nematode eats the maize rootworm (Hitpold et al., 2010).
2. There is an aggressive grass that induces defence in barley. When the roots of barley are stressed by the grass they emit a chemical which reduces the number of aphids that land on the barley (Dewhirst and Pickett, 2010; Glinwood, 2003).

3. There is an ant that attacks acacia. When attacked the acacia emits a chemical which attracts or increases the population of bacterial associates (Heil et al., 2010).
4. There is a bacteria on the tobacco plant that communicates with other bacteria by releasing a lactone (AHL). This lactone increases resistance of the tobacco to a certain caterpillar (Heidel et al., 2010).

In this fourth case, the authors conclude “Our results demonstrate that AHL can affect herbivore resistance, although it is *not clear whether this is a direct or an indirect effect*” (152).

What is happening? The story that plant signaling happens within or between two, implodes completely. The story, even, that the signaling or communication is initiated within the two creatures by virtue of some force or impulse contained within one of these beings, implodes. The story that these thirds are indirect, accidental and incidental, implodes. The inter-kingdom range and variability of these mechanisms shatters once and for all the hermetic seal of those dyads. Taken together, these destabilize the underlying narrativational axis upon which our confidence in explaining the phenomena even rests: that classical x and y-axes upon which the concepts of *direct versus indirect, origin versus outcome, organic versus inorganic, kin versus alien, self versus non-self, actor versus object, and even plant versus animal* were themselves stabilized and made-meaningful.

V. *Where? Above or Below? Territories or The Rhizosphere*

And where are we even *looking* for signaling? A further uprooting of our confidence occurs when we learn that, while “[m]ost initial studies concentrated on the role of above-ground volatiles” (Dicke et al., 2003: 403) plants, in fact, communicate intra- and inter-specially through other media than air and in different regions than the above-ground. Chemical, mechanical, and electrical signals travel underground. “[T]he connections of unrelated plants underground via mycorrhizal networks might be a major thoroughfare by which information is exchanged in plant-plant interactions” (403). A recent study designed to control for above-ground transmission

confirms the rhizosphere—the “narrow region of soil...immediately adjacent to roots...that is directly influenced by root secretions and associated soil microorganisms” (Wikipedia)—to be a major zone of signaling (Heidel et al., 2010).

Naturally we presumed that communication needs ears, human or canine, to pick up vibrations; and noses to pick up olfactory cues; and eagle eyes, or rods and cones, to receive light; and especially mouths, palates, tongues and uvulae to utter words or sound-signals. And naturally we presumed that if *real* communication happens it will be between and across beings with those body parts, and those living in the area of the biosphere we *communicators* inhabit: in air, above ground, out of water, in our ecological territories. Yet, plants enjoy the co-inhabitation of two distinct zones: the sky part and the earth part. Plants enjoy a relation to touch that we do not, by virtue of their straddling two elemental zones: the earth and the air, and growing slowly, into these. As air-breathers they can connect up with anything in that sphere. As earth-touchers, they can connect with anything in that sphere. Do plants enjoy qualities and freedoms of movements—passions even perhaps—not available on the surface? French philosopher Luce Irigaray writes, of the passions: “Touching is hidden away...beneath the earth...In the damp, soft warmth some contact would persist...If it does not die completely, it is because it remains still under the earth” (Irigaray, 1992: 33). In her major ethical treatise, *An Ethics of Sexual Difference* where Irigaray works out what would be required of us, and a world, in order to live harmoniously and lovingly together among genuine difference, she admonishes:

We need to...remember or learn about the role of movement in the passions...all forms of passively experienced passions in which the subject is enclosed, constrained, deprived of its roots, whether vegetal and earthly or ideal and heavenly. Sap no longer circulates between the beginning and the end of its incarnation (Irigaray 1993, pp 72-3).

Plants *could* remind us of our passions because they express differently. And fish, living another range to emit and receive, within. And cormorants, air and water. Bacteria: every possible zone, in motion and rest. Fetuses: typically water and then air.

Signaling through any and all means, through any and all in-betweens, is wherever and whatever “emits” and receives chemical, mechanical, photovoltaic, kinetic “particles.” The elemental planes—earth, air, fire, water—are not merely background elements for other genuine organic communication to use in the service of real communication among genuine communicators. Rather, it seems that these, as well, are the agents of communication: “the Mechanosphere, or rhizosphere” (Deleuze and Guattari, 1987: 74).

VI. Multiple, fine...but still therefore Beneficial?

We tried to keep *mutuality* contained to the couple, but could not.

What about that other forceful prong of function: the premise of *benefit* that “...each partner depends directly on the other for its reproduction”?

The strongest pushback against any straightforward mutualism premise is this: there seem to be *as many interspecies cases* where there are *no obvious positive fitness consequences to the “emitter” at all*, let alone a short stretch of benefits followed by down turn. There are many instances where “Attacked con-specifics ‘warn’ neighbors but do not themselves get anything “back” for it.... Airborne signals usually improve the resistance of the receiver, but without obvious benefits for the emitter, thus making the evolutionary explanation of this phenomenon problematic” (Heil and Karban, 2009: 137). What we seem to often have is a unidirectional inter- and intra-species and even intra-kingdom, signaling system. “Communication between plants can produce large effects in terms of induction of putative defensive chemicals as well as resistance to herbivores, although it is not clear at this time that either of the plant species tested benefit from this communication” (Karbon et al., 2000: 70). Recall the model case of the sagebrush and the tobacco. The tobacco experiences enhanced protection against a bug (herbivore) which does not even negatively affect the first plant, the sagebrush and was not the stress factor that precipitated the chemical emission by the sagebrush. We see this also in plant-insect ostensible mutualisms: “The purpose of this chemical communication from cotton plants to wasps is *presumed* to be to allow the predatory wasp to more easily obtain the location of its

preferred prey—one of two types of parasitic herbivores feeding on the cotton plants...[t]he communication system studied here *could* have evolved to save the wasp’s energy in finding the right plant to land on. However, the advantage to the cotton plant is less clear as the wasp does not destroy the herbivore immediately (using the herbivorous host for egg laying) so that the herbivores remain feeding on the cotton plant for some time after the chemical signaling” (Doyle 2009: 441). These cases certainly loosen the grip of the beneficiary-functionalist premise of mutualism, at least if we restrict our definition of “benefit” to reproductive purpose.

Besides the empirical question, however, there are a few relevant conceptual questions to ask:

First, how *do* we, or scientists, studying these so-called beneficial interactions, conceptualize, perceive and hence confirm, empirically, positive outcomes? In truth, a time-frame must be imposed before an “outcome” can be measured. In field studies, the time-frame imposed maps onto the funding time-line a project has. It is entirely possible that after 4 years of counting tobacco plant seeds in the neighborhood of sagebrush, and finding more in the fourth year than in the first year, we could publish an article giving evidence of an increase in number, thus arguing a beneficial outcome for tobacco in terms of reproductive capacity by virtue of sage. But, if we looked for longer, maybe we wouldn’t be able to give a linear, feel-good story about outcomes. This is true for many phenomena. Flood control embankments in Bangladesh created habitats for the flies that carried *leishmaniasis* (Minkin et al., 1996). Adjusting industrial practices to make meat protein affordable and widely available (poultry or beef) improved nutrition. But, the conditions of industrial agriculture made those very sites epicenters for zoonotic diseases including S.A.R.S. pandemic of 2002 and “Mad cow” disease (Waltner-Toews, 1999; 2007). Looking episodically at a time-slice experimental situation we do seem to see tobacco plants’ resistance to grasshoppers and cutworms improved, quite possibly by virtue of its friendly neighbor, the sagebrush. But,

“[o]ver five years of experiments, tobacco plants next to damaged sagebrush produced more flowers and seed-bearing capsules but were also more susceptible to frost damage compared with controls. However, there was a negative correlation between tobacco capsule production and distance from

sagebrush indicating that sagebrush has an overall detrimental effect on the fitness of tobacco plants” (Dicke et al. 2003: 403).

Second, how do we, or the scientists studying “plant communication,” conceive of the value of communication in general place such that we can locate its beneficiaries and its social site? It’s relevant for us to take note that a certain conceptual gesture is pervasive in the scientific literature: *if* the benefits to the emitter and receiver are not equal and not mutual, the description of the plant behaviour is downgraded from “communication” to “eavesdropping” (Preston, 2004: 912). If the signal flows to a third party this third party is called a “cheater.” We hear this worry: “Is the signal always ‘honest’...or can ‘cheating’ occur? Do species other than the two mutualists use this information exchange to exploit resources?” (Krebs and Davis, as cited in Hossaert-McKey et al., 2010: 76). These are the terms most commonly found: *eavesdropper, cheater, exploiter*. These are all perjorative. What does this linguistic usage reveal? Among other things, it suggests that, by definition, *communication* must always flow two-ways, and privately, between strictly identified and identifiable, worthy *owners*—the beings—of that dialogical, reciprocal, symmetrical transaction: anything other than that is *illegitimate, theft, freeloading, perversion, failure*. We *could* choose other terms for the indirect, unintended elliptical givings and receivings that seem to happen. An alternative to an “illicit escapee” framing would be to frame these through a narrative of the actions of generosity and gift; to draw from a conceptual terrain wherein the spontaneous, non-meritocratic reception of an uncontainable excess—whether protective VOC signals, a smiling flash of recognition, or a blood transfusion—by an unspecified and uncountable other or others, from an unidentified non-proximate other or others, *as the epitome* of the Good. In fact, under a Derridean or a Levinasian conception of the ethical, these are the *very kinds of relations* which can, and do, testify to the fundamental fact of goodness, and are the well-spring of any ethical authentic imperative. Derrida writes: The “imperative” or ‘law’...may be a necessity that escapes the habitual regime of necessity...necessarily understood as natural law...” (2001: 110). Levinas’ entire oeuvre is devoted to distinguishing ethics, which he conceives as action, a becoming, something undergone or received from without, from ontology, or the science of Being. He says, “Ethics does not have an essence...its ‘identity’ is to undo identities. Its ‘being’ is not to be but to be *better than being*. Ethics occurs as the compassion of

being...The surplus of the Other...is the way ethics intrudes, disturbs, commands...Neither my consciousness nor my instincts are sufficient to the excessive demand the other places on me...yet...[this] relation is like no other...but signifies all the surplus or all the goodness of *original sociality*” (Levinas, 1985: 10-11, added emphasis). What I am signaling here is that the *original sociality* of which Levinas speaks means any and all relations in which *responsiveness* can and does occur.

Conclusion: Becoming-plant? Or are you too attached to yourself?

Let us assemble our lacks: a lack of evidence confirming that improved fitness is the “point” of communication; an inability to confirm once and for all that growth or reproductive functions are served by communication, or at least the growth and reproduction of individual beings or types and over the long-term; an inability to localize “the communication” to direct signals within a dyadic unit; the permanent and varied role of organic and inorganic thirds and fourths in every communication mechanism. There is also the fact that scientific study of plant signaling has to isolate and fix its samples (genetically, geographically, temporally), and to carry-on “as if in a common garden” (Hossaert-McKey, 2010: 85). What is lacking is the living matrix itself.

Through what plant communication *might not be* we can start to feel something else entirely *being expressed*. Certainly different verbs than being, evolving, communicating, reproducing, defending. What is expressed is *becoming*. In their plateau, “1730: Becoming-Intense, Becoming-Animal, Becoming-Imperceptible...” Deleuze and Guattari write:

To become is not to progress or regress along a series...Becoming is not an evolution, at least not by descent and filiation...It concerns alliance...If evolution includes any veritable becomings, it is in the domain of symbioses that bring into play beings of totally different scales and kingdoms, with no possible filiation...” (1987: 238)

Thinking plant-thoughts shoves us in a *better* way than thinking animal-thoughts does, toward the truth that the “correct unit” of analysis is not the individual, nor the dyad, but “the assemblage.” The assemblage is not a unit in the sense of a stable physical entity with a particular form and having one or two particular components and one or two dominant functions, rather it is a description of the quality, or state, of a radical collectivity (or what Deleuze and Guattari cheekily call “unholy alliances”). An assemblage is less a thing than a transitory verb with a particular consistency, or a mobile state. And “[s]tates are made up not only of people but also of wood, field, gardens, animals, and commodities” (1987: 385). They write:

It is quite simple; everybody knows it, but it is discussed only in secret...Unnatural participations or nuptials are the true Nature spanning the kingdoms of Nature... involves terms that are entirely heterogeneous: for example, a human being, an animal, and a bacterium, a virus, a molecules, a microorganism. Or in the case of the truffle, a tree, a fly, and a pig. These combinations are neither genetic nor structural; they are interkingdoms, unnatural participations. These multiplicities with heterogeneous terms, cofunctioning by contagion, enter certain assemblages (241-242).

“All kinds of heterogeneous elements show up...not only the...materials, colors, odors, sounds, postures, etc...” (323). “We therefore call it the plane of Nature, although nature has nothing to do with it, since on this plane there is no distinction between the natural and the artificial” (266). The punchline is that the *teloi* or “self-realization” of plant communication is neither strictly individual nor even species-specific but is accomplished in and through radical kinships, through a fantastically versatile and multi-directional capacity to harmonize a multiplicity of actions. Whatever plants are up to, it *is* complex being-together in the world, an *original sociality* going beyond any simple sense of *between*.

Such insights should shame us away from our floral-show stereotype of “placing plants” in their correct position, ontologically, linguistically, morally. It should also uproot our habit of thinking that all this thought of ours is ultimately to help us to understand *what* they are. In its remarkable and singular power to thwart those very efforts becoming-plant *forces us* to think instead the complex ways that *plantness composes us*. “Deleuze opens us to the idea...that the elements of the different

individuals we compose may be nonhuman *within* us. What we are capable of may partake of the wolf, the river, the stone in the river” (Hurley, 1998: ii-iii). The idea of becoming-plant is an idea *within us*, composing us because becoming-plant happens. “No idea can exist unless the thing also exists,” but in turn “There is no thing of which there is not an idea in the thinking thing...” (Deleuze, 1992:116). Becoming-plant is a unique becoming, a unique field of forces *qua* idea and *qua* thing. “There are thus as many ideas as there are things, each thing being the object of an idea” (116). Thinking plant-becomings through the subject of plant signaling loosens the grip of the tyranny of form and function. It also loosens the tyranny of the narratives including the tendency to conceive of lower functions as if in the service of higher ones and the tendency to think of distant things as in the service of proximate ones.

One last confession: I don’t really *love* plants. I love philosophy. Thinking plant-becoming has massive political and ethical implications—at the level of new concepts and new actions—which I can only gesture to here obliquely, counting on the unholy power of the indirect. For one, plant-becoming opens up thinking about relations as transient alliances rather than strategies. It credits the accomplishment of identity and intimacy as a *radically collective achievement*, crossing faculties, bodies, phyla and even the most basic cut we so confidently declare: the organic and the inorganic. Plant-becoming also radically re-imagines Life as that which can be accomplished not within a successfully-managed organic encasement of what a thing is (its being, its teloi, its progeny) but, as that which can happen by virtue of *a certain unfaithful power of connectivity*.

Aristotle’s philosophical botany offers a very good tip. In *On the Generation of Animals* he advises, “...when it is necessary for [the animal] to accomplish in function of that which has life, it unites and copulates, becoming like a plant...” (1986: GA II C23 731b5). Vegetality expresses and supports the unthinkable complex web which holds together what things are, what they are trying to become, and what they need the support of all the rest to unbecome.⁷ What needs *unbecoming*? Among other

⁷ Though in various parts of his oeuvre Aristotle has argued for one or the other, or a priority among these capacities, there is textual proof that overall, Aristotle characterizes nutrition, growth & reproduction and decay as the three interrelated, non-sequential fundamental capacities of all living things as living things. These three functions are roughly in the service of the actualization of the states of Being, Becoming and Decay. Nutrition, or

things our terrible somatic and mental habits: our animality stereotypes. Becoming-plant as a labour of, and for, unbecoming a certain tendency in human thinking and human action, emits particles of that unfaithful, massive, power of connectivity.

Irigaray answers the circling canine interlocutors: “*How can I abandon my love of the vegetal? Would you become plant? Or are you too attached to yourself to become anything at all?*” (1992: 33).

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self-nourishment is necessary to “...maintain the being of what is fed, and that continues to be what it is so long as the process of nutrition continues.” (DA II C4, 416b 14-6); growth & reproduction are the goals “toward which all things strive, that for the sake of which they do whatsoever their nature renders possible” (DA II C4 a 11); “...grows qua growing from something into something. Into what does it grow? Not into that from which it arose but into that which it tends” (PH II, C1, 193b 16-18). Just as critically, though an individual’s telos realized in reproduction that individual must also realize its identity in a larger biological and temporal context where all other individuals—not just their kin and progeny—do, and will, share in the drive to actualize themselves. Individuals’ nature includes the capacity to achieve their decay—their unbecoming—so as to make room for the accomplishment of the individual at the universal level, and the achievement of life in general. I thank Doug Halls for pointing out the note in GA and working with me on this point.

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