
Finding Animals with Plant Intelligence: Attention, Doctores, Mysteries

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Fig. 1 "Dandelion" in Elizabeth Blackwell's *A Curious Herbal*

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“Attention, Attention.” Aldous Huxley, *Island*.

Attention: The Return of Plant Intelligence?

In a recent article in *Annals of Botany*, Anthony Trewavas offered an “admittedly controversial” argument to shift scientific (botanical) rhetoric toward “plant intelligence. As 99 percent of biomass of the earth, plants are clearly an evolutionary “success”, but why articulate this success as “intelligence”? Trewavas argues that such a vocabulary would help guide future research to less noticed aspects of plant signal transduction, whose complexity continues to unfold as researchers discover ever more subtle interactions between the “external” environment (e.g. wind) and the “internal” milieu of plant signal transduction (e.g. Calcium ions). This emerging research also suggests a convergence upsetting the taxonomical distinction between plant and animal:

Quite remarkably, the suite of molecules used in signal transduction are entirely similar between nerve cells (Kandel 2001) and plant cells. (Trewavas 2000; Gilroy and Trewavas 2001)

In an earlier article, what Trewavas wrote concerning researcher “attention” on signal transduction would later be applied to attention, or at least intelligence, itself. Here Trewavas attends to the effects of classification on researcher attention:

Although this classification was sensibly designed to bring order out of chaos, it had one major drawback. Division into just four types implied a limited diversity and perhaps a lack of specificity in the mechanism of protein dephosphorylation. Consequently, investigators have tended to concentrate attention on protein kinases where, it was surmised, all the action was to be found. (Trewavas 1999)

Trewavas, arguing for the importance of our rhetorical frameworks for the evolution of knowledge through the differential focusing of attention, closes his 2003 “Aspects of Plant Intelligence” with a rhetoric sampled, even grafted from a poem:

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Although we understand much more about signal transduction processes in plants than we did 20 years ago, there is a long road yet to travel, to jump the gap between cell, tissue and whole organism. In this article I have travelled Robert Frost's 'less travelled road'. My hope is that, in future, this may become a more major highway. (Trewavas 2003: 17)

As we might expect for an article navigating an "admittedly controversial" issue, Trewavas' text is itself a skillful rhetorical transducer that perhaps seeks to "jump the gap": plant intelligence becomes an active botanical argument in the very title of his "Invited Review" which would seem to presuppose the actuality of plant intelligence. Trewavas effectively displaces the question of the existence of plant intelligence by declaring that it has "aspects." Trewavas does not so much argue for plant intelligence as promise to map its characteristics and implications. Here, perhaps unknowingly, Trewavas follows Belgian Maurice Maeterlinck, who begins his 1907 *Intelligence of Flowers* with a similar, although not identical, device:

I need hardly say that I have no intention of reviewing all the proofs of intelligence which the plants give us. These proofs are innumerable and continual, especially among the flowers, in which the effort of vegetable life towards light and understanding is concentrated. (Maeterlinck 1907: 18)

Maeterlinck, of course, proceeds precisely to provide sumptuous proof of the eponymous intelligence oriented toward what he calls the "invisible kiss" of the insect pollinator, but Trewavas cannily remains silent, shifting the focus away from the pro/con dynamic of an argument about existence (an ontological argument) and toward an argument about attributes.

This analysis is no critique of Trewavas or Maeterlinck. While rhetorical skill and the "flowers of rhetoric" have long been decried as dangerous supplements (Derrida) and the allies of trickster Sophists, Trewavas' (and Maeterlinck's) discussion of plant ontology requires the skills of rhetoric as much as the more familiar high tech methods used in the study of plant signal transduction. How else might one enter into such an "admittedly controversial" area of discourse,

save with care and skill?

And while Trewavas writes that "for centuries, plants have been regarded as passive creatures" (Trewavas 2002: 841), in fact plant agency and plant intelligence has arguably been the rule rather than the exception throughout the *longue durée* of the history of botany. Ernst Haeckel, summing up the perspectives at the close of the nineteenth century, wrote of the "diverse opinions" that still characterized discussions of what he would dub "phytopsyche":

The plant-soul (phytopsyche) is, in our view, the summary of the entire psychic activity of the tissue-forming, multicellular plant (the metaphyton, as distinct from the unicellular protophyton); it is, however, the subject of the most diverse opinions even at the present day . . . (Haeckel 1901: 158)

Haeckel's treatment of phytopsyche as a "summary" emphasized the fundamental unity out of which any vegetative psyche might emerge as well as the unity of these "psychophysical" forces. Haeckel follows Gustav Fechner's formulation in mapping a continuum between matter and mind, plant and animal:

Modern comparative physiology has shown that the physiological attitude towards various stimuli (light, heat, electricity, gravity, friction, chemical action, etc.) of the "sensitive" portions of many plants and animals is exactly the same, and that the reflex movements which the stimuli elicit take place in precisely the same manner on both sides. . . these mechanical causes are neither more nor less psychophysical than the similar "reflex movements" of the sponges, polyps, and other nerveless metazoa, even though their mechanism is entirely different. (Haeckel 1901: 158)

As Elizabeth Wilson makes clear in her *Psychosoma*, such relations between psyche and soma (Fechner's "Psychophysik") proceed less through separation than involution; like Haeckel's famous embryos, they develop or "unfold" as much as they "separate". Different modalities for modeling the relations between body and mind enable and manifest different experiences and actualizations of body/mind. Wilson looks to the "gut" as a site for observing this nexus at work

in contemporary psychology, where the “second brain’ discovered within the stomach is often repressed and certainly not expressed, contributing to a wide range of “psychosomatic” symptoms for both psychology and its patients. The continuity Haeckel reveals in nature is a mechanical one, a continuous relation of moving parts in a kind of Rube Goldberg vision of nature (Oyama). But the great machinic phyla modeled by Haeckel, Fechner and Maeterinck were veritably composed of unity; the “whole” remained the main ingredient, as it were, of any living reality, even as living systems were increasingly modeled as machines. This mechanical monism was also a pan psychism: Haeckel's contemporary Fechner invents a science of perception that seeks to make measurement the central activity of his new discipline, psychophysics, and this scientific psychology yielded less alienation than a cosmic gnosis. As the historian and psychologist Edwin Boring argues in his introduction to Fechner's *Elements of Psychophysics*, “Consciousness, Fechner argued, is in all and through all” (Fechner 1996: xiii). Even in plants this unity is ascertained through a ubiquitous movement:

The character of the tissue-soul reveals itself in the same way in both cases...When the sensitive mimosa closes its graceful leaves and droops its stalk at contact, or on being shaken; when the irritable fly-trap (the dionaea) swiftly clasps its leaves together at a touch, and captures a fly; the sensation seems to be keener, the transmission of the stimulus more rapid, and the movement more energetic than in the reflex action of the stimulated bath-sponge and many other sponges. (Haeckel 1901: 159)

While Haeckel's use of movement (as well as the chanting repetition of “when...when”) to illustrate the intelligence of sessile plants may seem both paradoxical and practical given his audience of symbol wielding primates who (1) tend to identify movement with life, and (2) are often persuaded and transformed by rhythmic repetition, Maeterlinck notes that it is precisely the still “meditation” of plants that constitutes the impetus for their intelligence:

This vegetable world, which to us appears so placid, so resigned, in which all seems acquiescence, silence, obedience, meditation, is, on the contrary, that in which the revolt against destiny is the most vehement and the most stubborn. The essential organ, the nutrient

organ of the plant, its root, attaches it indissolubly to the soil. If it be difficult to discover among the great laws that oppress us that which weighs heaviest upon our shoulders, in the case of the plant there is no doubt: it is the law that condemns it to immobility from its birth to its death. (Maeterlinck: 10-11)

While Maeterlinck sees “revolt” against destiny in plant strategies of dispersion and movement, others have noted a sense of completion in this “vegetative state.” In Frederick Haselfoot's translation and commentary on Dante's *Divine Comedy*, he writes “The plant's soul is complete while in a vegetative state; but the man's is, in that stage, only on its way to completion.” Yet the 20th century German writer and botanist Ernst Jünger is probably more representative of the phytopsyche tradition in his emphasis on a plant agency articulated through figures of movement, a “triumphal march of the plant through the psyche”:

Just as Goethe views color as one of the adventures of light, we could view ecstatic intoxication [Rausch] as a triumphal march of the plant through the psyche. The immense family of nightshades thus nourishes us not only physically, but also in dreams. (Junger 2000: 35)

Crucial to Jünger's formulation is the ultimate “intertwingling” (Nelson) between plant and primate intelligence: the elaborate mechanisms of seduction, those solicitations of the “invisible kiss” described by Maeterlinck, act not only on insects but on thought. Inducing visions of intoxication and ecstasy, activating, amplifying and altering the interpretations of our dreams, plants in this analysis become an “extended phenotype” of primate thinking analogous to the outsourcing of angiosperm reproduction to insects. And Erasmus Darwin, the grandfather to Charles and an early evolutionist, described plant “sensation” in response to irritants as evidence for plant “brains”:

...the contraction of the muscles of vegetables seems to depend on a disagreeable sensation in some distant part, and not on the irritation of the muscles themselves . . . which evinces that vegetables are endued with sensation, or that each bud has a common sensorium, and is furnished with a brain or a central place where its nerves are connected. (Darwin 1825: 51)

Hence Trewavas' remarkable contributions must be contextualized by a history of botany and plant cultivation that renders plants as deeply interconnected with psyche, a task I have only schematically begun here. That history, though, begs the question: Why has plant intelligence become such an “admittedly controversial” topic given the undeniable ecological success of plants and the long history of phytopsyche? Perhaps, as with Trewavas’ example of plant signal transduction with which we began, this controversy emerges out of the challenge of focusing (primate) researcher attention on the differential temporality and scale of plant intelligence, perceptual factors that turn discussions of plant intelligence into recipes for incredulity or “controversy”. Early 20th century wireless pioneer J.C. Bose wrote extensively concerning plant feeling, prompting one commentator to complain of a rhetorical barrier separating Bose from the “non-scientific reader”:

If Professor Bose's opinions are well-founded we shall have to modify entirely our views on plant life, and indeed of the whole problem of life as well. It is a fascinating subject, but before Professor Bose's theories can be understood by the non-scientific reader they will require to be put into simpler language.

In a review in *Nature*, this rhetorical barrier rendered incredulity:

In fact, the whole book abounds in interesting matter skilfully woven together, and would be recommended as of great value if it did not continually arouse our incredulity. (Lockyer 1908: iv)

This “incredulity”, though, would seem to indicate less about Bose's material – recognizably in the tradition of Haeckel, Fechner and Erasmus Darwin, and written by an already well established scientist – than about readers of Bose's texts. In other words, incredulity is potentiated by forces outside the text, much as plant signaling is now recognizably intertwined with forces “outside” the plant.

Given this rhetorical history of widespread recognition of plant agency paired with powerful incredulity, perhaps we ought to read the poetic sample or graft with which Trewavas closes with some attention, chosen as it was to end an

article arguing for the importance of carefully chosen vocabulary in the creation of scientific models, what I will call "attention attractors" for future research, a category to which the present essay would declare membership. What does Trewavas' troping of Robert Frost's "The Road Not Taken" suggest about his inquiry into the "aspects of plant intelligence"?

Two roads diverged in a yellow wood,
And sorry I could not travel both
And be one traveler, long I stood
And looked down one as far as I could
To where it bent in the undergrowth;

Then took the other, as just as fair,
And having perhaps the better claim,
Because it was grassy and wanted wear;
Though as for that the passing there
Had worn them really about the same,

And both that morning equally lay
In leaves no step had trodden black.
Oh, I kept the first for another day!
Yet knowing how way leads on to way,
I doubted if I should ever come back.

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I
I took the one less traveled by,
And that has made all the difference. [1] (Frost 1916)

Note that even in its invocation of a title, Trewavas' sample drifts from the "Road not taken" (or a "road less traveled by") to a "less traveled road." Perhaps this is less an "error" in Trewavas' reproduction of Frost's text, than testimony to the circulation of Frost's poem as a commonplace, its characteristic as a "meme" that disseminates less as specific content, "the one less travelled by", than as an index, a vaguer but more plastic way of pointing to "that road in that poem by Frost." This "pointing," as has been noticed by commentators from Peirce to Austin to Guattari, is itself an action which does not require a meaning. It is testimony to the poem's ability to circulate and even differentiate itself in contact with human

consciousness whose attention it compels that it ceases to be a static text and instead becomes a matrix of texts capable of differential replication across diverse domains. In this sense, Trewavas' rhetoric itself exhibits something like a plant intelligence. Maeterlinck writes that precisely the limitations of plants - "the law that condemns it to immobility" - enables remarkable, even technical manifestations of intelligence in diverse and sundry mechanisms:

...therefore the majority of them have recourse to combinations, to a machinery, to traps which, in regard to such matters as mechanism, ballistics, aerial navigation and the observation of insects, have often anticipated the inventions and acquirements of man. (8-9)

Maeterlinck - the 1911 Nobel Prize winner for Literature - is perhaps at his most eloquent in describing these mechanisms of drift:

It exerts itself wholly with one object: to escape above from the fatality below, to evade, to transgress the heavy and sombre law, to set itself free, to shatter the narrow sphere, to invent or invoke wings, to escape as far as it can, to conquer the space in which destiny encloses it, to approach another kingdom, to penetrate into a moving and active world. (Maeterlinck 1907: 12)

Trewavas' transformation of "Road not taken" to "less traveled road", then, exhibits precisely this ability to "invent or invoke wings;" it is less accidental noise distorting an original than the veritable dissemination of meaning enabling the existence of any poem whatsoever. Only by being "transplanted" can Frost's poem circulate at all, and it is this ability to survive even a transformed transplantation that characterizes a wide range of invocations, all of which indexically, non semantically point our attention to "that poem by Frost." Here the flowers of rhetoric, the diverse and sundry devices for managing the attention, are themselves on display in Maeterlinck's brief but glorious catalog of plant technologies:

Every seed that falls at the foot of the tree or plant is either lost or doomed to sprout in wretchedness. Hence the immense effort to throw off the yoke and conquer space. Hence the marvelous systems of dissemination, of propulsion, of navigation of the air which we find on every side in the forest and the plain: among

others, to mention, in passing, but a few of the most curious, the aerial screw or samara of the Maple; the bract of the Lime-tree; the flying-machine of the Thistle, the Dandelion and the Salsafy; the detonating springs of the Spurge; the extraordinary squirt of the Momordica; the hooks of the eriophilous plants; and a thousand other unexpected and astounding pieces of mechanism; for there is not, so to speak, a single seed but has invented for its sole use a complete method of escaping from the maternal shade. [2] (Maeterlinck 1907: 14-15)

Escaping the “maternal shade” of static meaning, it is as a mechanism for capturing and moving attention that Trewavas samples Frost, and here too he learns from the plants, whose flowers, Maeterlinck notes, function as a “spectacle” capturing insect attention: “And the energy of its fixed idea, mounting from the darkness of the roots to become organized and full blown in the light of the flower, is an incomparable spectacle” (Maeterlinck 1907: 14-15).

Yet can “intelligence,” as a “road not taken,” capture researcher attention in way that will bring the extraordinary capacities of plant signaling into spectacular focus? Trewavas suggests that “plant intelligence” is like a visualization technology, a “viewer” that enables researchers to perceive different aspects of a complex system such as plant signaling.

Viewing plants as expressing intelligent behaviour should lead to better understanding of their ecological success and indicate experiments to test the basic concept (Trewavas 2004: 353).

Certainly, experiments with different rhetorical softwares (Doyle 1997) or “metaprograms” (Lilly 1964) such as “plant intelligence” are likely to prove useful for differentially organizing the complexity presented by plants and other living systems for the attention of primate researchers. Metaphors and other rhetorical strategies appear to be useful devices for such primate knowledge prospecting precisely to the extent that participants treat them as tools and heuristics rather than ontologies. “Plant intelligence” itself may not be up to the task of shifting researcher attention and perception, constrained as it is by the very history that reduced multiple intelligences (Gardner 2006) in primates to those which most closely matched the premises of a subculture of primate

researchers. For example: The coincidentally named Firn responded to Trewavas in the pages of the *Annals of Botany*, questioning the propriety of the language of “intelligence” for “organisms that lack individuality.” While individuation (as distinct from individuality) is a remarkable attribute of homo sapiens as well as snowflakes, Firn's phrasing seems to transform a difference into a lack. Would a non-primate in a less individuating and individualist ecosystem map a field of redwoods or a single sequoia as lacking individuality? Does the Great Barrier Reef or the Great Red Spot of Jupiter lack individuality? Thermodynamically speaking, all are dissipative structures seeking to maximize entropy far from equilibrium, sometimes through individuation but often through mutualist, symbiotic evolution. Individuality is a trait, and one (rightly) highly valued by many, but it is hardly “missing” from a field of aspen any more than collectivity is wanting in a crowded urban street.

Yet Firn's “Alternative Point of View” also declares that Trewavas's investigation of plant intelligence made him “very aware that human language guides and greatly limits our thoughts...”

Finally, the author, during the preparation of this article, has become very aware that human language guides and greatly limits our thoughts when trying to appreciate the functioning of plants. It might ultimately be unproductive to debate whether a plant has memory, whether a plant can learn or whether a plant can possess a spatial map, because the key terms come from an organism that is highly individual, an organism that finds it hard to appreciate the faculties of organisms that lack individuality and all that that implies. Our language lacks appropriate words. However, if new words are needed to describe how plants function, maybe we should invent new ones rather than trying to redefine existing ones (Firn 2004, 34).

Firn's point of view is that of a “neologista,” suggesting that we require new terminology for new models of plant behavior. And “intelligence” is hardly an unproblematic vocabulary even among humans, often captured as it is by the structural anthropocentrism and cultural monocultures that transform the vast array of human cognitive diversity to “intelligence” rather than “intelligences” (Gardner). Most instructive here, though, is Firn's awareness: thinking through

plant intelligence, Firm discovers his ontology as a “symbolic species” (Deacon 1998), a primate who both wields language and is crafted by it.

This remembrance of being scripted is the hard won goal of diverse pedagogies in philosophy, science and religion; it is apparently quite difficult for humans to use language while remaining aware of its limitations. Alan Watts suggested that with our gift of the logos, humans often mistake “the menu for the meal,” and Alfred Korzybski sought to teach that “the map is not the territory.” Hence to paraphrase Robert Anton Wilson, “plant intelligence is... some words”. [3] That is, by experimenting with alternate scripts (Schank and Ableson) for “plant” “behavior”, we disrupt our rhetorical habit structure and become slightly more aware of the limitations of any given script. From this perspective, Trewavas intervention is valuable precisely for the incredulity it may inspire, incredulity that should attend any rhetorical articulation that seeks to hang static labels on the dynamic complexity of living systems.

And like Frost's “Less Traveled Road”, Trewavas's text is itself less static than disseminatory, his tropes a “marvelous system of dissemination” resonating with forces outside botany, including the shamanic tradition of plant teachers or “doctores” that inform a renewed cultural encounter with plants. Researcher Eduardo Luna writes of his fieldwork in the Upper Amazon:

In the city of Iquitos and its vicinity there is even today a rich tradition of folk medicine. Practitioners, some of whom qualify as shamans, make an important contribution to the psychosomatic health of the inhabitants of this area. Among them there are those called *vegetalistas* or plant specialists and who use a series of plants called *doctores* or plant teachers. It is their belief that if they fulfill certain conditions of isolation and follow a prescribed diet, these plants are able to “teach” them how to diagnose and cure illnesses, how to perform other shamanic tasks, usually through magic melodies or *icaros*, and how to use medicinal plants. (Luna 1984)

“Intelligence” has no doubt re-emerged as a question in the discipline of botany under the extraordinary influence of the rhetoric of “information”. From the mechanical monism of Fechner unfolded a reductionist vision influenced by cybernetics (which itself was often holistic and systemic in outlook) toward a

networked “postvital” paradigm of biology understood as reductionist systems of information controlled by genes (Doyle 1997, 2003). Perhaps predictably, though, this informatic reductionist paradigm is on the decline, with more distributed and interactive models (such as plant signaling) on the ascent. Because rhetorics of “plant intelligence” and its “networks” of signaling are in many ways the artifacts of this historical paradigm of information, we risk once again mistaking the map for the territory. Most crucially, despite the ample evidence for the entangled nature of plant intelligence and the human psyche, the rhetoric of “plant intelligence” risks separating such plant intelligence from the human capacity to observe it, an epistemological error that has troubled objectivist science since at least the early 20th Century (cf. Barad 2007). It may be that we must further stoke our “incredulity” by taking seriously the observations of researchers who suggest “plant teacher” in intra-action with human observers (Barad) is a better map for organizing researcher attention in the densely interactive chatter of plant signaling science. In an unusually courageous inclusion of subjective experience in a scientific context that is often hostile to “subjectivity,” Ethnobotanist Dennis McKenna, whose scientific efforts were instrumental in discovering the chemical action of ayahuasca, writes:

Ayahuasca has been for me both a scientific and professional continuing carrot, and a plant teacher and guide of incomparable wisdom, compassion, and intelligence. My earliest encounters with ayahuasca were experiential; only later did it become an object of scientific curiosity, sparked in part by a desire to understand the mechanism, the machineries, that might underlie the profound experiences that it elicited. (McKenna 2008)

Working with the more anonymous archive of the internet, we find enormous numbers of first person reports of the “plant teacher” experience under the influence of diverse plants, including ayahuasca, psilocybin mushrooms, cannabis and salvia divinorum or “diviner's sage. [4] One of the most remarkable reports wisely writes that:

Encounters with entities who teach or guide are a characteristic feature of hallucinogenic ayahuasca trances. For discussion purposes, we have granted ontological status to these entities

without regard for the epistemological or metaphysical implications of that status. (Gracie and Zarkov 1986)

This capacity to “bracket” the incredible ontological and epistemological implications is an achievement that requires us to recognize and then dissolve our incredulity as a condition of inquiry, and it is vital to any consideration of plant intelligence, an enterprise in which open and even “empty” mind is called for. Using the widely accepted definitions of Gardner (1999) and Tupper's (2002) findings suggest that experience with a plant teacher can foster what Gardner called “existential intelligence.”

Existential intelligence . . . involves having a heightened capacity to appreciate and attend to the cosmological enigmas that define the human condition, an exceptional awareness of the metaphysical, ontological, and epistemological mysteries that have been a perennial concern for people of all cultures." (Tupper 2002, 503)

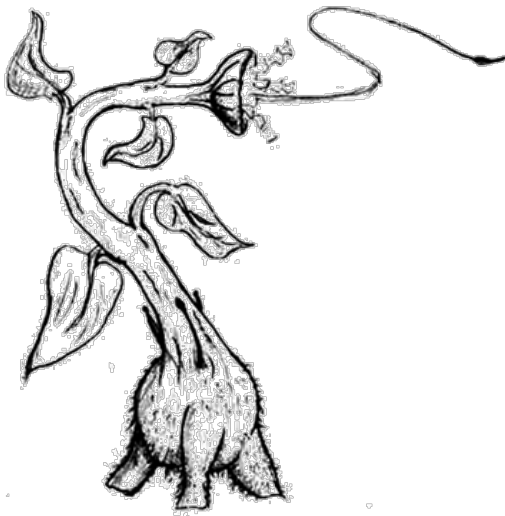


Fig. 2 "Triffidwynd" by John Wyndham

Persephone's Return? Plant Teachings & Eleusis

“Sacrament”, c.1175, from O.Fr. sacrament (12c.), from L. sacramentum "a consecrating," from sacrare "to consecrate" (see

sacred); a Church Latin loan-translation of Gk. *mysterion*
"mystery." *Oxford English Dictionary*

Tupper emphasizes the role of plant teachers in practices seeking to amplify existential intelligence, and his formulation of the latter in relation to "mysteries" is instructive: an unacknowledged and little recognized aspect of European discourse on plant intelligence can be found in the Eleusian Mysteries of Ancient Greece. While the "doctores" of the Upper Amazon and global psychonauts may be dismissed as somehow "other" or even "alien" to the mostly Eurocentric and objectivist traditions of contemporary technoscience, the role of plants as attention attractors for the human mind in a foundational Euro-Asian myth may inspire slightly less incredulity towards my arguments for the salience of "plant teachers" as a useful map for future research in plant signaling. Jack Finegan, in *The Archeology of the Old Testament*, provides a concise summary of the mythological narrative informing the Eleusian Mysteries as well as a "symbolic" interpretation of them:

Demeter came [to Eleusius] seeking her daughter Persephone who had been carried by Hades (Pluto). The King gave Demeter hospitality, and in gratitude she presented his son Triptolemus with the first grain of corn and taught him how to till the soil. The grief of Demeter over the abduction of her daughter symbolizes the mourning of nature over the death of the plants in winter, and the return of Persephone symbolizes the springing up of growing things after the months of death. (Finegan 1992, 143)

The rites of the Mysteries enacting and commemorating this departure and return of Persephone (and the plants) were the most important in ancient Greek culture. Well into the Roman Empire, Cicero provides a *locus classicus* for articulating the magnitude and importance of Eleusis:

Much that is excellent and divine does Athens seem to me to have produced and added to our life, but nothing better than those Mysteries by which we are formed and moulded from a rude and savage state of humanity; and, indeed, in the Mysteries we perceive the real principles of life, and learn not only to live happily, but to die with a fairer hope." (Thackara 1978)

Scholar Dudley Wright summarizes the general opinion of Eleusis from Ancient Athens until its closure by Theodosius I in 392 AD:

Every manner of writer – religious poet, worldly poet, sceptical philosopher, orator – all are of one mind about this, that the Mysteries were far and away the greatest of all the religious festivals of Greece. (Wright 2003, 26)

The persistent role of plants in the Mysteries have been recognized by many scholars in diverse disciplines. As Muller wrote, “it was thus that the ancient Greeks described the disappearance and return of vegetable life in the alteration of the seasons” (Muller, cited in Dudley Wright 2003: 31). And by all accounts, the myth concerns Demeter's plant gift to humans – corn – as well as the knowledge of how to till the soil in focused attention and human/plant interaction. More recently, scholars and scientists have focused on the likely plant composition of the kykeon, a beverage described in the seventh century B.C. Hymn to Demeter, the only textual source for the Mysteries.

The ingredients of the kykeon were revealed in the seventh century B.C. in the so called Homeric Hymn to Demeter (it was written by an anonymous poet and not by Homer) as follows; water, barley and blechon or glechon a fragrant Mediterranean mint, probably *Mentha pulegium* or *Mentha aquatica*. (Valencic 1994)

Because initiates at Eleusis undertook a vow of silence whose violation carried the penalty of death, the Hymn to Demeter is our only material guide to the nature of these rites besides scattered hearsay. The hymn's phrasing even in translation is illuminating for an investigation into plant intelligence. According to the classic translation of the hymn by Hugh G. Evelyn-White, Persephone, daughter of Demeter:

Was playing with the deep-bosomed daughters of Oceanus and gathering flowers over a soft meadow, roses and crocuses and beautiful violets, irises also and hyacinths and the narcissus which Earth made to grow at the will of Zeus and to please the Host of Many, to be a snare for the bloom-like girl -- a marvelous, radiant flower. It was a thing of awe whether for deathless gods or mortal men to see: from its root grew a hundred blooms and it smelled most sweetly, so that all wide heaven above and the whole earth

and the sea's salt swell laughed for joy. And the girl was amazed and reached out with both hands to take the lovely toy; but the wide-pathed earth yawned there in the plain of Nysa, and the lord, Host of Many, with his immortal horses sprang out upon her -- the Son of Cronos, He who has many names. (Evelyn-White 1914)

Note that in this, the opening stanza of the hymn, all the action centers on a human/plant interaction, with Persephone herself compared to a flower as she gathers flowers: "the bloom-like girl." Already, plant and human are intertwined. And the flowers themselves act as a "snare", a "thing of awe" that "amazed" Persephone, so capturing her attention that she sought to pick the "lovely toy" such that, perhaps, she might focus further on it. Indeed, on this account all of the Greek cosmos had their attention captured by the sweet smelling hundred blossoms: "all wide heaven above and the whole earth and the sea's salt swell laughed for joy." Laughter is a response that is notoriously difficult to control; the cosmos itself could not but rejoice in the beauty and fragrance of the flowers. It is hence these blooms' capacity to attract and "amaze" the attention of not only insects, but the gods and the cosmos itself, which is narrated here. What might this emphasis on the attention focusing capacities of flowers indicate for the rites and nature of Eleusis?

It is not my intent to seek to "resolve" our very definition of the mysterious. Indeed, the existential intelligence discussed by Tupper would suggest that, unlike Persephone, we might experiment with allowing the enigma of Eleusis to remain as it is, beholding it but not holding fast to it in search of an oxymoronic understanding or ownership of Mystery. It may be that, pace Firn, the Mysteries teach us precisely about the limitations of human understanding and the constraints of language and perspective on it. Yet it is indeed striking and suggestive that in this myth and rite - itself arguably a precursor to Christian rites of communion - plant capacities to act on the attention of humans and the cosmos are repeatedly indexed and referenced, often in a dizzying cascade of floral prose:

Roses and crocuses and beautiful violets, irises also and hyacinths and the narcissus which Earth made to grow at the will of Zeus and to please the Host of Many, to be a snare for the bloom-like girl --a

marvelous, radiant flower. (Evelyn-White 1914)

And while much remarkable recent scholarship and science focuses on the exact identity of the plant sacrament used at Eleusis, perhaps it is time to refocus our attention on the fact of a plant sacrament and plant manipulation of human attention in one of our foundational cultural narratives. More recent practices, such as those of the UDV, a Brazilian and now legal American church devoted to a plant sacrament of the Upper Amazon, points to the persistence of this troping of and reverence for plant agency and teachings even in the post modern, scientific worldview. Recall that for Cicero “indeed, in the Mysteries we perceive the real principles of life, and *learn* not only to live happily, but to die with a fairer hope” (italics mine). This is existential intelligence indeed: may we learn from, become “moulded” and informed by, its teachers.

Notes

[1] Plant tropes are themselves a persistent strategy within Frost's poem: Beginning with what is commonly characterized as a “fork” in a road, we follow the advice of the sage Yogi Berra, who advises us that “If you see a fork in the road, take it.” Unlike the Book of Genesis, which begins with the performative declarative “In the Beginning”, “Road Not Taken” veritably “grows from the middle like crabgrass” (Deleuze and Guattari) and begins with an already existing multiplicity. Here Frost is closer to the Kabbalistic tradition of the Elohim and “tree of life” than Genesis. The poem thus begins with a morphological characteristic of plants and, turning to human consciousness for the first time, laments that it is not a plant and cannot, unlike Cannabis Sativa, be sliced and cloned, and “be one traveller”: Two roads diverged in a yellow wood, And sorry I could not travel both And be one traveler, long I stood. Note too that the very background or condition of possibility of this divergence is itself a forest, a “yellow wood”, a prior collective of plants “in” which the roads diverge. The narrator then explores the very limit of vision, and this limitation is itself framed visually, “bent” by plants: “And looked down one as far as I could To where it bent in the undergrowth.”

[2] De là l'immense effort pour secouer le joug et conquérir l'espace. De là les merveilleux systèmes de dissémination, de propulsion, d'aviation, que nous trouvons de toutes parts dans la forêt et dans la plaine; entre autres, pour ne citer en passant que quelques-uns des plus curieux : l'hélice aérienne ou samare de l'Érable, la bractée du Tilleul, la machine à planer du Chardon, du Pissenlit, du Salsifis; les ressorts détonnants de l'Euphorbe, l'extraordinaire poire à gicler de la Momordique, les crochets à laine des Ęriophiles; et mille autres mécanismes inattendus et stupéfiants, car il n'est, pour ainsi dire, aucune semence qui n'ait inventé de toutes pièces quelque procédé bien à elle pour s'évader de l'ombre maternelle.

[3] "Reality is...a word." Cosmic Trigger

[4] There were 444 such results at the Erowid.org site alone on June 198, 2009. <http://www.erowid.org/cgi-bin/search/htsearch.php?exclude=&words=plant+teacher&Search.x=0&Search.y=0>

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