

“You can do this with mushrooms?!”: Wonder and DIY mycology

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Hosted by the Indiana University Consortium for the Study of Religion, Ethics, and Society (CSRES).

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[TITLE SLIDE] In November 2014, I began field work with a group of amateur DIY (or do-it-yourself) mycologists in the East Bay of the San Francisco Bay Area. In this presentation, I’ll be looking at the amazement and excitement they expressed when they talked about fungi. Inspired by Katherine Park and Lorraine Daston’s historical work on wonder, I’ll be situating these affective experiences in our contemporary moment and in the landscape of a radical ecological countercultures. I’ll conclude with some thoughts on the significance of these expressions in relation to modern science and the secular.

[SLIDE 2] For those who are already lost, mycology is the study of fungi, the taxonomic kingdom that includes mushrooms but also molds, yeasts, and other organisms.

The group that I joined as part of my field work was formed in 2011 inspired by the book *Mycelium Running* by the popular mycologist Paul Stamets. *Mycelium Running* (published in 2005) describes several innovative applications for fungi that Stamets calls “myco-restoration” — environmental restoration through the strategic application of fungi. These applications are meant to be accessible to anyone willing to learn the science and techniques.

[SLIDE 3] The group decided to call itself East Bay Radical Mycology (or EBRM — EE BARM) taking after a group in Olympia, Washington that one of its members co-founded a few years earlier. The goal of EBRM was (and continues to be) to learn and experiment with myco-restoration methods, especially mycoremediation — the bioremediation of industrial pollutants and other toxins by fungi. The mission of the group is be able to offer mycorestoration services to their community as a grassroots organization and to teach others about the wonderful

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Hosted by the Indiana University Consortium for the Study of Religion, Ethics, and Society (CSRES). capacities of the fungal kingdom. When I joined in 2014, the group had a listserv of 150+ and about twelve to fifteen regular members.

Despite their generational differences, EBRM members all participate, in varying degrees, in a distinct West Coast ecological counterculture that has deep roots in the Bay Area. As Richard Walker noted in his book on the history of regional parks in the Bay Area, the region is not only characterized by a “green” culture thanks to its long history of environmentalism but a “red” one, in its history of political activism and radicalism, especially since the 1960s. EBRM members reflect this regional culture in their shared values of egalitarianism, dispersed political structures, feminism, and biocentrism, and a complicated ambivalence towards capitalism. EBRM includes an arborist, two herbalists, an artisan cheese maker, an organic farmworker-slash-performance artist, two ex-Earth First!ers, and several permaculturists, as well as a retired chemical engineer, a retired hacker, and a retired carpenter. Members share interests in organic agriculture, natural medicine, revivalist foodways, and accessible DIY technologies. At their monthly potluck meetings, they swap stories, techniques, and recipes as well as tinctures, home brews, fermented foods, and of course foraged and cultivated mushrooms.

[SLIDE 4] Although large-scale button mushroom cultivation has been practiced in Europe since the 18th century, home cultivation only became popularized in the 1970s thanks to a growing demand for psychedelic mushrooms. Brief instructional manuals circulated at that time, products of an emergent West Coast publishing industry that marketed to the ecologically inspired counterculture. **[SLIDE 5]** With some sterile lab technique and home-made equipment like still-air boxes, cultivators were able to improve their success rate, expand their production,

and experiment with new methods and species. Some began to look for ways to put this obscure technical knowledge to use outside the black market.

[SLIDE 6] Paul Stamets’s career charts these developments. His first book (published in 1975) was a guide for foraging psychedelic mushrooms. His next (published in 1983) was the first comprehensive instructional manual for this otherwise ill-defined esoteric practice. His third book (published in 1993) looks specifically at growing gourmet and medicinal mushrooms and gives a cursory introduction to applications like mycoremediation and myco-filtration (methods that he would later group together as mycorestroation). And then there’s *Mycelium Running*, subtitled *How Mushrooms Can Help Save the World*, which is an unusual amalgamation of all these genres — part natural history book, part science textbook, part philosophical manifesto, part instructional manual, and part field guide. [SLIDE 7] Besides waxing poetic about fungi’s liminal ecological position at the cusp of life and death and their role as “nature’s great recyclers,” in *Mycelium Running*, Stamets, goes further to argue that fungi are sentient beings that have an ecosystem’s best interests in mind. He refers to them as allies, friends, collaborators, even shamans. In his words, they are “wise,” and we would be wise to listen to them.

[SLIDE 8] => Here, I should stop to explain that what is known as a “mushroom” is actually the fruit of a fungus that exists primarily hidden from view, often in decaying wood or soil, in the form of mycelium, a rhizomorphic web of thread-like filaments.

[HERE: we can see primordial — or “baby mushrooms” — coming up from the mycelium in the soil.] The first part of *Mycelium Running* is entitled of “Part I: Mycelial Minds.” In the

first chapter, “Mycelium as Nature’s Internet,” Stamets explains that this networked form of consciousness is present throughout the universe, at all scales, from neurons in the brain to dark

matter in space, making it (truly) universal.¹ He calls this network model “the mycelial

archetype.” [SLIDE 9] The text includes an array of mesmerizing images of these other

networked phenomenon that are briefly noted in the text but whose full significance is left to the reader to figure out.

Hanging out with and interviewing members of EBRM, one of the first things that impressed me was their infectious excitement about the fungal kingdom. It especially came out in one-on-one interviews. These narratives were told with a smile, both earnest and light-hearted, some times acted out with exclamatory force. For most, discovering the science and ideas in *Mycelium Running* was a turning point in their narratives. [SLIDE 10] For example, here, Erin was telling me about learning about mushrooms while she was working at a permaculture farm in Hawaii. “[At first], it was just a very basic, ‘Oh, mushrooms are cool!’ I didn’t realize mushrooms could save the world {laughs} until a couple years ago. I picked up *Mycelium Running*, and... [pauses to remember] I was studying Fukuoka’s natural farming technique, and in the process of cultivating indigenous microorganisms to boost up your compost pile and create this amazing, nutrient-rich topsoil for your garden, I was reading more about the role of fungus and the mycorrhizal relationship between plants and fungi and all of that. And I was just like, ‘Whoa!’”

[SLIDE 11] In this next quote, Renee was telling me about how her and her friends got interested in mushrooms in college. “We were fascinated by their role within their ecosystems and really excited about it, and we’re like, “Whoa!” — as an ecology student in college — “Wow!” — when I learned about mycorrhizal fungi my freshman year of college. It blew

¹ p. 9

my mind and I was so excited about it. Just seeing how everything is connected ... it just fit in — all these things I was learning about fungi just fit in — how they can clean up oil spills, and they’re part of this healing process, inner and outer, and creating sustainable communities— it just fit in so well with all these other things that I was thinking about.”

We see that both Erin and Renee are talking about applied mycology. They’re looking to understand how fungi behave in the world as part of a wider understanding of ecological systems — especially micro-ecologies. They’re interested in what fungi *do* — and *can* do — in these ecosystems.

What I discovered in my field work was that this “Whoa!” was an almost ubiquitous, generic expression of enthusiasm for kingdom fungi. It’s marks being at a loss for words, stunned by their strangeness and capacities. I refer to this affective state as “amazement” or “excitement,” following the language of the speakers. I want to focus on two themes of this amazement — connectivity and potentiality — and make some suggestions as to what it is about them that’s amazing.

As we see in Renee’s and Erin’s words, the initial cause of amazement is mycorrhizal fungi. [SLIDE 12] Briefly: these are a type of fungi that form symbiotic relationships with plants, especially trees, weaving itself around — and sometimes inside — their roots, extending the plants ability to derive nutrients from the soil while living off the sugars provided by the tree’s root system. Ecologically, they play important roles in keeping trees, and forests, healthy.

Mycorrhizal fungi exemplify mutually beneficial ecological connectivity in their form and function, but more than that, they also embody a kind of relationality and connectivity in a way that is wonderful to these speakers and extends beyond this specific chemical, material

interaction with their associated plant hosts. For Renee, the beneficent mutualism attributed to mycorrhizal fungi is conceptually extended to the mycelial structure writ large and from there, to the mycelial archetype as a social and psychological metaphor.

[SLIDE 13] Evan, another member of EBRM, expressed similar amazement at fungal connectivity when he recalled to me what it was like reading *Mycelium Running* for the first time, practically yelling. “*Whoa!!! Nature's Internet!! This is crazy!*” {Laughing} ... He continued, saying, **And the level at which mushrooms are responsible for healthy ecosystems, all of the different connections, really kind of blew my mind.**”

Looking at the images in *Mycelium Running*, we can relate to his enthusiasm. There’s something awesome and poetic in these concepts, but they are also grounded in the scientific discourse of mycology — facts, citations, and empirical observations. As a result, the amazement the speakers feel is both cognitive *and* affective. It’s not the awe of beholding a wondrous object, as premodern wonder was often experienced, but rather, the awe of *learning* about fungi, acquiring new information and understanding. The experience is both mental and more than “just” mental. “It blew my mind” is a phrase that three of the speakers use. For Evan, these facts and ideas are “crazy.” The scientific reality of fungi seems to transcend or transgress common knowledge and perception.

But besides just *learning* about fungal connectively, the experience of understanding is also an *experience* of connectivity — of fitting together pieces of a complex puzzle and seeing correspondence between seemingly unrelated things. It’s a connectivity between “levels,” as Evan puts it. A dizzying aspect of this is the way that it resonates with a kind of infinite regress, similar to the fractal-like repetition of the mycelial archetype. We see this in the way Renee

moved seamlessly from ecological connections to the beneficial psychological effect of psychoactive mushrooms, to the remediative functions of fungi, to the metaphor for mutualistic communal relationships. In connecting the tangible white threads of mycelium to the immaterial patterns of her own life world, she weaves a meta-web of meaning, a move that multiplies the cognitive pleasure of understanding.

Potentiality is also a source of amazement and excitement. Going back to Evan, he told me: **“I was reading about the remediative potentials, and it just got my mind going thinking about all these applications. And I'm like, ‘Why the hell isn't this happening?! Right now? Why isn't this happening?’”**

[SLIDE 14] Sam’s response when he first read *Mycelium Running* was similar. He told me: **“I don't remember when or how I read *Mycelium Running* or how I came across it but -- the remediation thing blew my mind -- that was the thing that I was like, ‘what the fuck — you can do this with mushrooms?!’**

Again, it blows the mind, but it also gets the mind going, as Evan puts it. In understanding the particularities of fungal life — such as the way fungi break down hydrocarbon molecules — the possibilities for its application become clear, resulting in a feeling of effervescence as ideas and excitement bubble up mixed with feelings of immediacy and urgency. There’s a sense of redemptive hope that’s tacitly linked to our own will and determination — or more specifically, the speaker’s personal ambition — to engage with and realize this potential.

But what *is* this feeling of amazement? One aspect of it seems to be a kind of vastness perceived in the infinite iterations of the network model, which itself, by definition, spreads out. Vastness is a feeling that has historically been associated with wonder in the Euro-American

Christian cultures, but in the past, it was often fearsome, like the stark awesome wilderness of early American naturalists. Mycelium, on the other hand, is hidden, even modest, buried underfoot; moreover, it is imbued with beneficence — it has our best interests in mind; it wants to collaborate. This kind of vastness reflects a departure from historically intimidating sense vastness might be seen as a reflection of mystical ecological visions today that tend to see nature as a cradling web that supports humans (and which we’ve stupidly victimized, in the process victimized ourselves).

Another aspect of this amazement is a sense of greatness — as powerfulness — the **potency** implied by **potentiality**. Anthropologists have noted that assertions of potential are also claims about what the future can and should be, and in this way, such assertions are always moral and political in nature, however implicit. Evan and Sam’s animated enthusiasm and sense of urgency seem to tap into and channel this potency — they both become energized, emphatic, their speech almost aggressive. The possibilities of myco-remediation are colored with ethical imperatives about building the future. In this way, fungal potentiality is a vehicle in particular constructions (and experiences) of hope, empowerment, and futurity.

[SLIDE 15] These expressions of amazement are an amplification of the affective dimension of scientific understanding — an amplification that signifies a specific cultural orientation and ethical-political stance. To these DIY mycologists, the meaning of mycology is not simply the expansion of human knowledge of the fungal kingdom — as normative understandings of science would have it — but rather, for them, mycology — both its study and its application — is a means to meaningful connect with the fungal world and a path into the wider complex web of ecological relationships.

I see these affective responses as reflections of biocentric values that decenter humans as primary actors in the world and instead favor a complex unity of myriad parts, attempting to move away from the subject-object orientation of instrumental manipulation and towards an interpersonal model for relationships with nonhuman life. I think it’s this interpersonal model that entails forms of affectivity that we think of as “personal” — such as affection, gratitude, and religious emotions like wonder.

In that they arise from the revelation of hidden patterns and the workings of an unseen world, these feelings of amazement and excitement have a mystical, revelatory quality. They’re the antithesis of Weber’s theory of disenchantment — here, scientific knowledge and learning is a *direct and primary source* of feelings of enchantment.

In the ecological counterculture of the Bay Area, connectivity is often a positive value that are seen as antidotes to modern alienation and ecological destruction. The evocative interpretation of mycology that Stamets presents in *Mycelium Running* elaborates this value to an ambitious degree, not only de-centering the human but humanizing nonhuman life. The worlds that are made, inhabited, and sustained by these alien, soil-dwelling life forms become as complex, promissory, and redemptive as the most sublime human technologies. In the process, the modern-secular teleology — the classic narrative of human progress through reason and science — is partially subverted and transformed. The result is a vision of ecological sublimity that we find reflected in these feelings of amazement and excitement. This syncretic blend of normative science and countercultural ecology is another way of doing science, one that’s not quite secular, but not really religious either. The immanent frame here is blurry with porous boundaries and is crowded with other kinds of life.