DELVING INTO THE PATCHINESS OF THE WORLD: MYCELIAL ORIENTATIONS TOWARDS PRACTICES OF SENSING, SHARING, AND CARING

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ABSTRACT

In an era of increasing precarity and ecological disruption, Anna Tsing's *The Mushroom at the End of the World* (2015) offers a compelling perspective on navigating life amid capitalist ruins. Challenging dominant narratives that relegate nature to a passive backdrop for human agency, Tsing follows fungal pathways to explore relational models of egalitarian, multispecies coexistence. Building on Tsing's transdisciplinary approach, this paper advocates for a shift beyond entrenched categorizations and extrapolations grounded in well-established conceptual frameworks of flora and fauna, proposing instead that fungi—with their intricate subterranean networks, subtle perceptual capacities, and remarkable symbiotic strategies—can serve as generative figures for imagining and co-creating alternative futures. Departing from the hierarchical logic of family trees and individualist competition—tied to an endless trajectory of progress, differentiation, and fragmentation—fungi offer a transformative paradigm for cultivating situated practices of sensing, sharing, and caring.

KEYWORDS

Fungal turn, Mycelial Entanglements, Relational Knowledge, Sensing, Sharing, Caring

Rooted in Enlightenment philosophy, Western cultures have long embraced an objectified central perspective—one that envisions knowledge as a linear progression toward ever-greater differentiation, perfection, and success. This perspective assumes a singular path of knowledge that unfolds from darkness to light, from intuition to reason, and from open-ended curiosity to rigid disciplinary categorizations. It fosters the illusion that humanity stands as the pinnacle of creation, detached from the cyclical processes of growth and decay that bind us not only to other living beings but also to the inanimate world. Within this framework, mastery—over nature, science, the arts, other beings, and even our own lives—becomes the ultimate goal. Yet, in our relentless pursuit of control, we often lose sight of the interconnectedness that sustains us. With such a narrow lens, it is little wonder that at times we fail to see the forest for the trees.

In the face of the Anthropocene's crises, the promises of Enlightenment seem increasingly hollow. Where is mastery when climate change threatens the very foundations of our existence? When we constantly find ourselves on the brink of exhaustion? When the political and social climate is driven by egoism and exploitation, with no remedy in sight? Faced with this reality, we must recognize that the imperfections and blind spots we observe in the world also concern our own lives. After all, the relentless pressure for self-optimization is difficult to reconcile with ethical ideals of tolerance, sustainability, and care. Yet, though perhaps unsettling, this recognition holds a liberating potential. Facing our own imperfections, we may also realize that we are always in the process of becoming—and it is in this very state of flux that our greatest potential lies.

If perfection exists at all, it does not lie in self-exaltation but in embracing uncertainty and the unexpected. Love begins with self-love and the willingness to share what we might perceive as flaws while recognizing the need for transformation. In the midst of complex relations and ever-shifting tides, loving ultimately means nothing other than "staying with the trouble," as Donna Haraway writes:

> We—all of us on Terra—live in disturbing times, mixed-up times, troubling and turbid times. The task is to become capable, with each other in all of our bumptious kinds, of response. Mixed-up times are overflowing with both pain and joy—with vastly unjust

> patterns of pain and joy, with unnecessary killing of ongoingness but also with necessary resurgence. The task is to make kin in lines of inventive connection as a practice of learning to live and die well with each other in a thick present.[1]

Given the challenges of climate change, social inequality, and other alarming consequences of capitalist politics, US anthropologist Anna Tsing's book *The Mushroom at the End of the World* (2015) offers a vital counterpoint to dominant narratives. Rather than presenting a bleak vision of collapse, Tsing explores the ways in which life persists amid capitalist ruins.[2] Rejecting the grand narratives that reduce nature to a purely passive and mechanical "backdrop and resource" for human intentions,[3] she follows the trail of the Matsutake mushroom to dissolve the rigid boundary between humans and non-humans, advocating for an egalitarian coexistence among the different species. While Western thought has long relegated the vibrant activities between human and non-human beings to the realm of myth, Tsing calls for "alternative narratives," for stories that "might be simultaneously true and fabulous" as they capture the actual "patchiness of the world." "It was left to fabulists, including non-Western and non-civilizational storytellers, to remind us of the lively activities of all beings, human and not human," Tsing argues. "The time has come for new ways of telling true stories beyond civilizational first principles."[4]

Moving beyond traditional conceptions of insight, Tsing envisions knowledge production not as a rigid system of classifications but as an emergent, collaborative, and artistic process—one that thrives in deviation, uncertainty, and entanglement. Rather than striving for mastery over nature, which in fact has only led to its exploitation and destruction, the ruins of capitalism could be seen not as an endpoint, but as a fertile ground for new ways of living, ones that focus on what is possible despite capitalism. Instead of adhering to rigid identities and distinctions—concepts closely tied to our intellectual need for an obvious "order of things"[5]—the realities of change and transience may in fact offer grounds for hope. "We are contaminated by our encounters; they change who we are as we make way for others," Tsing emphasizes. "Everyone carries a history of contamination; purity is not an option. One value of keeping precarity in mind is that it makes us remember that changing with circumstances is the stuff of survival."[6]

How, then, should we engage with this inherent impurity and transience? The answer may lie beyond purely intellectual constructs—in the realm of embodied experience, sensory attunement, and a radical openness to the unexpected. In this regard, fungi emerge as powerful catalysts, offering a paradigm for new orientations toward sensing, sharing, and caring.

CURTAIN UP: EMERGING ON THE SCENE

The Enlightenment's opposition to darkness, invisibility, and the uncontrollable has introduced a spectrum of blind spots into modern cultures. Its teleological narratives of progress mirror the well-established models of fauna and flora, which are structured around hierarchical classifications, branching family trees, and competitive individuals striving for ever-greater perfection. Within this framework, the long-overlooked funga—the world of fungi[7]—offers an encouraging countermodel for development and coexistence. With their astonishing diversity of forms and colors, vast mycelial networks, highly sophisticated sensory capacities, and intricate strategies of cooperation and symbiosis, fungi defy conventional biological categorization. Their countless sexes and mating types, horizontal gene transfer, and other extraordinary traits challenge the plant-animal binary that dominates our understanding of life.

Apparently, "fungi just don't behave as organisms are supposed to behave," British anthropologist Tim Ingold points out:

> I mean, in mainstream biological theory an organism is a bounded, closed-up object. It's an identifiable object, a thing, and it interacts with an environment that's outside it or all around it. But fungi are not like that. They're not bounded. They extend in a fibrous mesh, all over the place. They leak. Stuff keeps moving backwards and forwards across their boundaries.[8]

Citing British biologist and educator Alan Rayner, Ingold even suggests that "if biology had taken the fungus as a prototype of what a biological organism could be, the whole of biology would be fundamentally different."[9] Indeed, as Mexican based curator and environmental researcher Yasmine Ostendorf-Rodríguez underlines, fungi tend to resist fixed classifications:

> The more you learn about fungi, the more puzzling they become. Fungi throw up questions, never answers. And that's exactly what makes them so tantalizing appealing. […] The fact that there are

always exceptions to every rule—divergent mycelial variations or rebel mushrooms that mess up the whole categorization—makes them hard to pigeonhole.[10]

Yet perhaps the most remarkable feature of fungi is their sheer ubiquity. They permeate every aspect of our environment—dispersed in the air as myriads of invisible spores, weaving through soil as microscopic hyphae, and emerging in an astonishing variety of fruiting bodies. They inhabit the most unexpected places, colonizing skin and nails, infiltrating wood and plaster, and thriving on bread, jam, and cheese. They enrich our diets through yeast, mushrooms, fermented foods, and alcoholic beverages. They can heal or harm, induce spiritual experiences or drive us mad. Most crucially, fungi play an essential role in sustaining ecosystems. "Wood wide webs" of mycorrhizal networks serve as transportation routes, facilitating an exchange of nutrients and information between plants.[11] As mediators between life and decay, fungi break down organic and inorganic compounds, recycle materials, and sequester carbon. They regulate nitrogen cycles in the ocean and offer sustainable alternatives to meat, leather, synthetic dyes, packaging, insulation, and construction materials. Their adaptability in the face of challenges and extreme conditions is unparalleled. Fungi have been observed zombifying ants, mapping complex traffic patterns, simulating cosmic gas filaments, and even surviving in outer space.

Despite their omnipresence and major ecological significance, fungi have long been marginalized in scientific inquiry. Compared to botany and zoology, the study of fungi remains in its infancy. This neglect is partly due to fungi's resistance to the 'light of reason.' While indigenous and spiritual traditions have long recognized their fundamental role in the cycles of life and death, Enlightenment thought seems to have a symptomatic blind spot regarding a realm that inherently touches on *invisible structures* and *dark spaces*. This is also what French philosopher and sociologist Roger Caillois observes in his compelling analysis of schizophrenia—a clinical condition marked by its stark contrast to rational, enlightened thinking. Caillois conceives of schizophrenia as a process of "depersonalization through assimilation into space," or to be more precise, "dark space into which things cannot be put"—which is due to its opaque structure that literally seems to be inhabited by invisible agents: "Whereas bright space disappears, giving way to the material concreteness of objects, darkness is 'thick'; it directly touches a person, enfolds, penetrates, and even passes through him. Thus the 'self is

permeable to the dark but not to light'; the feeling of mystery we experience at night probably stems from this."[12]

Caillois's keen analysis—reminiscent of Haraway's notion of "inventive connection" as a practice of learning in a "thick present"[13]—sheds light on possible reasons why fungi have remained largely absent from the grand narratives of scientific progress.[14] And even when they did gain attention—such as during the psychedelic movement of the 1960s or in early studies on psilocybin's therapeutic potential for anxiety and depression, which not incidentally threatened to undermine rationalist tendencies—efforts were swiftly made to suppress their significance.[15] It was not until the late 20th century, with advances in genetics, microbiology, and molecular biology, that mycology began to emerge as a field of immense scientific potential. Ultimately, if one thing is certain today, it is that we still know astonishingly little about fungi.[16]

After centuries of neglect and stigma, the past two decades have witnessed a dramatic resurgence of interest in fungi, driven by pioneering researchers and environmental activists such as Suzanne Simard, Paul Stamets, Peter McCoy, Giuliana Furci, and Merlin Sheldrake.[17] This recent "fungal turn" has sparked an explosion of research in both fundamental and applied mycology. Beyond developing new biotechnologies to address climate change, this shift signals a profound transformation in ethical and aesthetic perspectives—one that, as Allison Mackey and Elif Sendur emphasize, demands "an urgent and imminent investment in fungi and mycelium via their ontological and political potential."[18] Drawing inspiration from mycelial networks that thrive through interconnectedness and mutual support, such an investment could transcend traditional logics of exclusion, power, and control. At the same time, it could foster new forms of activism rooted strategies of sensing, sharing, and caring—practices essential for addressing the socio-ecological crises of our time. To speak with Murray Bookchin, an investment in fungi might align with the "eco-anarchist project" of a "social ecology" which is based on the belief that "the mere existence of *differences*—including differences of greater or lesser complexity—does not presuppose or imply hierarchy, least of all in relationships between human beings and other life-forms."[19]

ACT ONE: SENSING AND BECOMING INTENSE

Haraway's *thick present*—the space in which we must immerse ourselves in order to make kin—is far from being an abstract concept.

Beyond the comfort of intellectual or emotional detachment, it invites us into a greater, entangled world of heterogeneous beings, perceptions, preoccupations, interests, needs, and states of consciousness. Within this dense weave of lived time, rigid distinctions between past, present, and future dissolve. As Gilles Deleuze and Félix Guattari describe in their seminal study on capitalism and schizophrenia, *A Thousand Plateaus*, lived time manifests not as a linear progression but as a "rhizome"—an intricate network where space and time collapse into a field of "asignificant particles or pure intensities."[20] This model of the rhizome, a biological structure that is closely related to mycelial networks,[21] shifts focus away from discrete objects or subjects and toward dynamic entanglements—what Deleuze and Guattari call "assemblages" (*agencements*) of different forms of becoming where individual identities merge into a network of relations. In these assemblages, "it is no longer of any importance whether one says I," as we all "have been aided, inspired, multiplied," Deleuze and Guattari emphasize:

> All we talk about are multiplicities, lines, strata and segmentarities, lines of flight and intensities, machinic assemblages and their various types, bodies without organs and their construction and selection, the plane of consistency, and in each case the units of measure.[22]

Unlike hierarchical "models of arborescent descent," in which evolution moves from the least to the most differentiated, the rhizome appears as an "anti-genealogy"—"operating immediately in the heterogeneous and jumping from one already differentiated line to another."[23] By undermining master narratives and embracing complexity, it functions not as a fixed structure but instead as a dynamic map—one that does not merely represent reality but actively generates transformation:

> The map is open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification. It can be torn, reversed, adapted to any kind of mounting, reworked by an individual, group, or social formation. It can be drawn on a wall, conceived of as a work of art, constructed as a political action or as a meditation.[24]

In its deep connection to the thick present, the rhizome does not offer escape but rather a method for navigating crisis—an opportunity to engage with capitalist ruins and imagine new futures.

Growing up, I found ruins to be some of the most captivating spaces of life and imagination.[25] These remnants of the adult world—abandoned places stripped of their former utility, untouched by efficiency or perfection—opened up entire universes for me, more beautiful than anything I could have envisioned. Crumbling walls were enough to make me the proud mistress of house and yard; splendid chambers, a kitchen, side rooms were inhabited by exuberant plants; the sky above me was wide and bright; had I been granted a wish back then, I would certainly have asked for the thorny brambles to overrun all spaces and times and never release this magical retreat for anyone's arbitrary purposes. These secret refuges suspended the boundaries of time and space, immersing me into a state of presence that gave rise to vibrant parallel worlds. In their imperfection and ephemerality—qualities I would only later come to recognize—they blurred the lines between nature and culture, functioning as portals between worlds and triggering an aesthetic experience that made a spectrum of fantastic futures tangible. Looking back, I see those ruins as sites of self-empowerment—places where nature reclaimed what culture had seized, only to release it again in an act of unexpected generosity. In these liminal spaces, norms dissolved, creativity flourished, and I felt profoundly connected.

In their transience and unexpected emergence, mushrooms are somewhat akin to ruins. Searching for them engages the senses in the present moment, offering a thrill of discovery that can verge on obsession. One lucky find often leads to another, drawing the forager deeper into the landscape. The gaze sweeps across the forest floor, guiding the body along unpredictable paths shaped by subtle visual, olfactory, and tactile cues. Leaves are brushed aside, fingers press into moss, a shift in balance is instinctively corrected as a knee touches the ground. A newly discovered specimen is examined not just visually but through touch, smell, and taste—for its texture, moisture, and the transformations it undergoes in the process. Each sensory detail offers clues for identification. All senses become engaged, fostering a stillness and presence that are rare in modern life. Anyone who has spent time foraging for mushrooms, or has delved into the study of mycology, may relate to what Tsing describes: "Mushrooms pull me back into my senses, not just—like flowers—through their riotous colors and smells but because they pop up unexpectedly, reminding me of the good fortune of just happening to be there."[26]

John Cage, whose fascination with mushrooms deeply inspired his artistic practice, reported a similar experience. For him, foraging was not just an exercise in mindfulness but an embrace of serendipity—the fascinating fact that unexpected discoveries could illuminate entirely unrelated problems in an unforeseen way. This openness to observation and chance not only shaped his compositions, such as his famous piece *4'33"*, but also his teaching methods at the New York New School for Social Research.[27] Yet beyond their sudden appearances, mushrooms also evoke a deeper awareness of transience and solidarity, as Cage observed:

> What permits us to love one another and the earth we inhabit is that we and it are impermanent. We obsolesce. Life's everlasting. Individuals aren't. A mushroom lasts for only a very short time. Often I go in the woods thinking after all these years I ought finally to be bored with fungi. But coming upon just any mushroom in good condition, I lose my mind all over again. Supreme good fortune: we're both alive![28]

By sharpening our awareness of life's vibrancy, mushrooms hold great transformative potential. One might say that they enable a "pure becoming of minorities"[29]—a form of becoming that is "perfectly real" and "produces nothing other than itself" as it transcends all expectations and boundaries, generating what Deleuze and Guattari describe as an "involution" that is at its very heart "creative," "communicative," and "contagious." "Becoming is always of a different order than 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."[30] Fungi, in this sense, reveal the limitations of human-centered perspectives and invite us to embrace new forms of relationality—ones grounded in shared vulnerability, creative exchange, and the transformative potential of unexpected encounters.

ACT TWO: SHARING AND MAKING KIN

Alongside the growing interest in fungi, the past two decades have also seen a broader shift toward sharing cultures: "Solidarity, cooperation, generosity, hospitality—in short, sharing is re-emerging."[31] In the digital age, where the internet mirrors the wood wide webs, this "sharing turn" is unsurprising, given the potential of commons and open-source initiatives. Flagship projects such as Free Software and Wikipedia "have shown that sharing and collaboration can lead to results that are comparable, if not superior, to traditionally

produced products and that new types of organizations which embody these principles are sustainable, adaptive to changing environments and resilient in the face of dynamic economic developments."[32] However, social media has led to a perversion of cultures of sharing, transforming them into self-perpetuating loops of validation. The relentless pursuit of likes has taken on a life of its own, leaving the real-world relationships that sharing as a social act is actually aimed at falling by the wayside. Given this reality, it is crucial to critically assess digital cultures and cultivate alternative, tangible forms of sharing that counter the control mechanisms of the internet and social media. Engaging with fungi provides one such alternative, fostering encounters where worlds, values, and desires are not only shared but collaboratively shaped and reimagined.

Creating new narratives requires a fundamental reevaluation of existing disciplines, categories of knowledge, methodologies, institutions, and infrastructures. In this context, Roger Caillois argued that increasing specialization and fragmentation within the sciences obscure holistic perspectives and hinder joint initiatives. Since the 1930s, he championed cross-disciplinary and artistic research as pathways to making science more responsive to contemporary challenges. His concept of "diagonal sciences" advocated for dialogue between diverse fields, countering the isolation of different domains and cultures of knowledge. By fostering creative inquiry, such an approach could prioritize unifying forces over divisive tendencies, urging the expansion of networks and transversal paths of communication. "Slicing obliquely through our common world" and involving "the workings of a bold imagination," the diagonal sciences might help "decipher latent complicities and reveal neglected correlations," Caillois points out–using a metaphor that again shows striking parallels to the mycelial realm: "Such a network of shortcuts seems ever more indispensable today among the many, isolated outposts spread out along the periphery, without internal lines of communication–which is the site of fruitful research."[33]

Tim Ingold takes a similar perspective. In his transdisciplinary history of lines, a history of cross-connections between the most diverse forms of human activity, he explores how countless threads, traces, pathways, and strands of action intertwine, just as if they were part of a vast mycelial web.[34] While he acknowledges that he cannot categorize the theoretical framework of his study, Ingold underlines that in the process of its unfolding, he ultimately had to relinquish his role as a detached observer, embedding himself within

the network of actors shaping his narrative through their diverse activities:

> I have joined the ranks of draughtsmen, calligraphers, handwriters, storytellers, walkers, thinkers, observers—indeed of practically everyone who has ever lived. For people inhabit a world that consists, in the first place, not of things but of lines. After all, what is a thing, or indeed a person, if not a tying together of the lines—the paths of growth and movement—of all the many constituents gathered there? Originally, 'thing' meant a gathering of people, and a place where they would meet to resolve their affairs. As the derivation of the word suggests, every thing is a parliament of lines.[35]

Ingold's insights resonate with broader ecological and philosophical perspectives. Beyond the human realm, he finds that other animals, plants, fungi, and even landscapes or cloud formations do not form a collection of isolated entities but an immense "*meshwork* of entangled lines of life, growth, and movement," a boundless "web of life."[36] Following Deleuze and Guattari, Ingold speaks of "bundles of lines" that resist rigid hierarchies, instead forming centers of dynamic, co-evolving activity.[37] Recognizing this interconnectedness challenges conventional knowledge production and calls for fluid, adaptable modes of inquiry along those very "movements of deterritorialization" that Deleuze and Guattari incite with the notion of assemblage, emphasizing that "a social field is defined less by its conflicts and contradictions than by the lines of flight running through it." As Deleuze and Guattari argue, an assemblage "has neither base nor superstructure, neither deep structure nor superficial structure; it flattens all of its dimensions onto a single plane of consistency upon which reciprocal presuppositions and mutual insertions play themselves out."[38] In this relational perspective, activism that seeks egalitarian coexistence among social groups or species must embrace subtle, indeterminate movements of growth and transformation—modes of becoming that transcend static classifications by fostering creative solutions and collaborative innovation.

As Ingold points out, fungi offer an exemplary model when it comes to „establishing a mode of conviviality, of being able to get along together."[39] Their biological characteristics, manifold occurrences and applications, and rich sensory qualities have a great potential to inspire collaborative, transdisciplinary, and interspecies

engagements. Whether in a forest, where mycelial threads sustain complex ecological networks; a factory, where mycelium-based materials reshape industries; a lab, where fungal cultures yield groundbreaking discoveries; or an exhibition, where experimental formats merge with science communication. Fungi exemplify an assemblage of the most diverse forms of becoming, where everything revolves around allying with one another in a process of mutual transformation. If shared joy is indeed multiplied joy, then encounters with fungi are not only a joy in themselves, but can also catalyze an ethos of equality and reciprocity. By bringing together individuals from various backgrounds, fungi-inspired collaborations not only enable new approaches toward urgent challenges such as climate change but also enhance social and interspecies cohesion.

This is not merely a hypothetical claim but grounded in real-world cooperative experiences. The following two projects illustrate how fungi-related practices facilitate meaningful sharing.
On a crisp autumn morning, a diverse group of individuals—scientists, artists, educators, mycologists, ecologists, and philosophers—meet in Switzerland's Entlebuch Biosphere to share their practices.[40] With no rigid agenda, after a short warm-up they embark on a mushroom hunt, exchanging individual approaches, knowledge, and perspectives along the way. Everyone involved has a chance to learn from the other participant's experiences and explore new aspects and possible approaches to the world of fungi. The open-ended structure benefits the process in every respect. The exchange unfolds organically, not least allowing for moments of serendipity. While the participants enjoy the chance for in-depth conversations during their roaming through the forest, the discussion naturally shifts back to the whole group as soon as a spectacular find has attracted everyone's attention. At the end of the day, it is clear that further encounters and future collaborations will develop from this first one, which has brought to light a multitude of inspiring ideas, connections, correspondences, and differences.

In a more structured workshop setting, participants—many with no prior knowledge of fungi—gather in a shared space.[41] Large sheets of round paper, cushions, and colorful drawing materials set the stage for an interactive exchange. After a brief introduction to fungal ecology, the participants gather in small groups to share their experiences, knowledge, and imaginations around fungi in a free-flowing and non-hierarchical process while sketching and mutually

interweaving their lines of thought on the sheets of paper. Initially hesitant, they soon begin to share anecdotes ranging from culinary and psychedelic experiences to reflections on fungi in science fiction, the building sector, and medicine. Each story triggers new associations, which in turn generate new stories. A vivid dialogue unfolds, resembling fungal spore dispersal—ideas branching out, intertwining, and generating inspiration for future conversations. Individual knowledge transforms into a communal resource, reinforcing the power of shared exploration.

ACT THREE: CARING AND CURATING

Alongside the growing interest in fungi and sharing cultures, the past decades have not least seen a shift towards an "ethics of care" that provides, according to Virginia Held "a promising alternative to the dominant moral approaches" as it "offers hope for rethinking in more fruitful ways how we ought to guide our lives."[42] Unlike "idealized images of family peace" or "dubious claims about universal norms," such an ethics of care can only be grounded in lived experience, that is, in a reflection on existing values and practices, including the unique characteristics, strengths, and limitations of those involved in caregiving.[43] In contrast to moral theories that are based on the idea of equal, independent, and self-interested individuals, such an ethics of care views people as fundamentally "relational and interdependent" beings, both "morally and epistemologically."[44] It is shaped not only by political structures, public infrastructures, and social hierarchies but also by personal habits, perceptions, and emotions. As Held emphasizes, from this perspective the idea that morality could be constructed "*as if* we were Robinson Crusoes, or, to use Hobbes's image, mushrooms sprung from nowhere, is misleading."[45]

Although Held does not critically engage with Hobbes's metaphor, her reference opens an intriguing avenue for reconsidering ethics through the lens of fungi. In the early 17th century, the prevailing scientific belief was that mushrooms spontaneously emerged from nothing—an idea that led Hobbes to imagine humans as similarly independent beings with the moral right to act "as if they had suddenly sprung up from the earth like mushrooms (*fungorum more*) and grown up without any obligation to one another."[46] However, contemporary science and ethics both contradict this view. As Federico Zappino and Brunella Casalini argue, "what Hobbes calls the 'individual' is only the most visible part of a web of interdependence":

> Paradoxically, we can confirm Hobbes's intuition about coming to the world fungorum more. This is only possible, however, because individual human existence, just like that of the carpophore, depends on the intra- and interspecies infrastructure that supports it, destabilizing or even unraveling the hierarchies between nature and society, and subsequently between public and private, center and periphery, but also between human and non-human and between living and non-living.[47]

Just as fungi thrive through intricate interactions rather than in isolation, ethical action should not be grounded in abstract moral concepts but in situated knowledge and real encounters. Seen in this light, engaging with fungi offers important insights that might be fruitful for an ethics of care that seeks inspiration in real-world experiences. It not only sharpens our senses, increasing awareness of the present moment and the specific needs of a given situation; it also provides a model for cultures of sharing that enable collaborative and symbiotic relationships which can extend beyond individual interests or disciplinary boundaries; finally, it challenges outdated notions of independence and self-sufficiency, paradigms that are closely aligned with neoliberal ideology, where personal well-being and success is the ultimate goal.

Western philosophy has long debated whether humans are naturally cooperative (as Rousseau believed) or inherently selfish, requiring social intervention to foster collaboration (as Hobbes argued). US anthropologist Michael Tomasello's research suggests that, compared to great apes, human infants demonstrate an innate willingness to help and cooperate.[48] Yet, in the Anthropocene, it seems that humanity must relearn the importance of cooperation and care—not merely as a social necessity but as a foundational principle for sustainable and equitable ways of living. Addressing today's socio-ecological crises requires moving beyond capitalist paradigms and recognizing that a better future depends on collective action.

Given the urgency of alternative narratives, fungi provide a compelling model for resilience and adaptation that gives new meaning to the idea of a "crisis as chance," as Yasmine Ostendorf-Rodríguez claims: "Crises equal opportunities for fungi, as they present a situation in which to expand on their collaborations and, therefore, increase symbiosis. In times of crisis, fungi demonstrate how dominant, centralized, highly technological or exploitative power

dynamics and patterns could, and should, be challenged."[49] Considering that crises throughout history have often benefited those already in power, not to mention that climate change is obviously threatening fungi alongside plants and animals, this view may be overly optimistic. However, there is little doubt that human destruction ultimately poses a greater risk to humanity itself than to the fungal world, which will most likely find ways for its survival.

Fungal strategies of sharing and caring, emphasizing reciprocity, stand in stark contrast to colonial and patriarchal models of aid, which reinforce a supposed hierarchy between benefactors and beneficiaries.[50] According to Ostendorf-Rodríguez, fungi can help us see that "authentic help means that all who are involved help each other mutually, growing together in the common effort to understand the reality which they seek to transform."[51] Similarly, Colombian multimedia artist Carolina Caycedo defines her practice as a "reciprocal gesture" that integrates art-making with a deep empathy for individuals, communities, and non-human entities. "Rather than organizing, I'm navigating these mycelia, these networks of affection and care," Caycedo describes:

> It starts with the care for the body of water that is being affected, for the territory or the land where you are from and that community recognizes itself across the continent. […] I weave myself into existing networks rather than providing the structure for them to become. Perhaps what my work can do is to make them stronger, temporarily at least. I see my role as an ally. As someone that might bring resources in.[52]

Collaboration enables multiple perspectives and expands possibilities for action. Peruvian artist Lucia Monge, a member of the collective FIBRA, describes working with fungi as profoundly transformative due to the constant care work mushroom cultivation requires—given that fungi are much more susceptible to spoilage than most plants. As Monge underlines, "taking care is a powerful way of learning—it is not a school, not a theory; you can only learn if you are there, if you show up for this other living being."[53] Of course, Monge's argument is a delicate one, as the mentioned fungi apparently never have asked for artistic care. However, dealing with living organisms such as fungi—provided that one considers ethical standards[54]—can increase awareness of the needs of social and natural environments in general. Furthermore, collective work—mirroring fungal networks—fosters healthier collaboration, easing

individual burdens and allowing for shared responsibilities, rest, and parallel commitments. Shifting focus from mastery and competition to mutual learning and support therefore enables an emancipatory aesthetics and activism that drive meaningful change.[55]

Across local communities and international grassroots movements, there is a growing recognition that fungi can contribute to more sustainable lifestyles.[56] Their eco-sociological potential spans new technologies based on a circular economy as well as an understanding that joy and knowledge generally multiply through practices of sharing.[57] In this context, given the necessity of driving change, curating emerges as a practice of care in the most literal sense.[58] It involves not only overseeing the content and strategy of a given project but also ensuring fair resource distribution and meaningful participation—both professionally and personally. It also requires effective and sustainable mediation between people, ideas, and environments.

Considering these aspects while reflecting on my own experiences as a curator, an exhibition on fungi that I co-curated with Jutta Strohmaier in 2023 immediately comes to my mind as one of the most enriching experiences.[59] Not only was the collaboration with the participating artists particularly rewarding, as their diverse experiences with fungi and fungal communities seemed to foster a deep sense of cooperation and mutual respect. Compared to other projects, the mediation work also was highly enriching. The show *Try, Feel, Fail. Learn. Think. Play. Observe* was a great success. Unlike many independent exhibitions, visitor engagement remained strong throughout its duration. Attendees came from diverse backgrounds—some deeply invested in fungi, others drawn by chance or curiosity. Some had studied, cultivated, or consumed mushrooms, others had never even heard that something like a funga exists. Some were familiar with art but new to fungi, for others, it was the other way around. Many stayed longer than expected, opening their senses, engaging in discussions, and exploring the works with mindful curiosity. More than just an exhibition, the show became a space for cross- and transdisciplinary dialogue and a sense of kin—a testament to the power of fungi-inspired collaboration and care.

EPILOGUE: DELVING INTO MYCELIAL SPACE

Reflecting on my experiences of recent years through the lens of Donna Haraway's notion of a *thick present*—a space of deep inspiration and connection—I can say without exaggeration that I have

rediscovered this sense of belonging within the world of fungi. Like all essential discoveries, fungi entered my life without my seeking them. One day, they emerged in my mind much like one of those specimens you might suddenly stumble upon in the forest—amid trees, shrubs, deadwood, moss, and fallen leaves. On an impulse, I initiated the transdisciplinary project *Mycelial Space* with Ilka Becker and Jutta Strohmaier, embarking on a journey whose parameters were immediately self-evident.[60] Unlike many previous endeavors, it demanded collaboration, integrated scientific and artistic methods, and required engagement across diverse spaces and contexts. It invited both discursive and sensory exploration, balancing purposeful action with openness to discovery. Most importantly, it was about engaging in relationships and embracing the present moment, encouraging participants to share experiences, perceptions, intuitions, knowledge, insecurities, and responsibilities. These guiding principles have sustained the project, allowing it to evolve and continuously generate new encounters and collaborations.

There are countless ways to immerse oneself into the world of fungi. While the rhizome model still suggests a somewhat rigid assemblage of different forms of becoming—resonating with the rather static image of interwoven plateaus—mycelial networks offer a more dynamic model—one that embodies sensitivity, adaptability, and mindful agency. Within the project *Mycelial Space*, our collective engages in processes that, to come back to the image of Carolina Caycedo, are not only about co-creating sustainable living and learning environments, but also about navigating and delving into existing networks of affection, mutual respect, and care.[61] At the heart of these engagements are the core capacities of sensing, sharing, and caring. *Sensing* entails openness to the present moment and adaptability to changing circumstances, ensuring genuine participation. *Sharing* fosters a spirit of generosity—the implicit trust that giving leads to mutual enrichment rather than loss. *Caring* finally shifts the focus from individual interests to collective well-being, empowering all beings and environments involved.[62]

As is prominently known, fungi not only exemplify highly sophisticated strategies for sensing, sharing, and caring—they also embody the darker, more unsettling aspects of life. A key aspect of engaging with fungi is confronting vulnerability and mortality—experiences that are central to human existence. As decomposers and mediators between organic and inorganic matter, fungi are intimately

connected with decay and death. Some species, like the death cap, *Amanita phalloides*, are lethal in small doses. Others, such as molds and soil fungi, affect their environments through invasive growth or toxic spores. Pathogenic fungi like *Candida albicans* thrive at the expense of their hosts, while *Cordyceps* species even manipulate animal behavior, effectively turning ants into compliant zombies. In summary, it can be said that fungi are both exceptional collaborators and formidable survivors. Acknowledging their ecological complexity challenges simplistic idealizations or disrespect. Yet, given their historical marginalization—often overlooked, misunderstood, or even demonized—fungi offer profound insights into human and multispecies ecological systems. Their biological characteristics provide a lens for critiquing capitalist strategies while also inspiring new technologies that hold ecological promise.

At the dawn of the 21st century, it is time to embrace an interdisciplinary field that resists easy answers, instead demanding attentiveness, adaptability, and responsiveness. Fungi invite us to engage fully with the lived present, offering a crucial perspective for navigating the complexities of the Anthropocene—one that moves beyond rational illusions of superiority and pointless fears of loss.[63] Rather than chasing purity, limitless growth, and perfection—visions so often shattered by reality—fungi remind us that creation and decay are inseparable aspects of the very same process. Amid the remnants of capitalism's excesses, the essential practices of sensing, sharing, and caring remain ever-available pathways toward renewal.

1 Donna Haraway, *Staying with the Trouble. Making Kin in the Chthulucene* (Duke University Press, 2016), 1. As Jane Bennet points out, we can also make kin with inert matter: "I equate affect with materiality, rather than posit a separate force that can enter and animate a physical body. My aim, again, is to theorize a vitality intrinsic to materiality as such, and to detach materiality from the figures of passive, mechanistic, or divinely infused substance." Jane Bennet, *Vibrant Matter. A Political Ecology of Things* (Duke University Press, 2010), xiii.

2 Anna Lowenhaupt Tsing, *The Mushroom at the End of the World. On the Possibility of Life in Capitalist Ruins* (Princeton University Press, 2015).

3 Tsing, *The Mushroom at the End of the World*, vii.

4 Tsing, *The Mushroom at the End of the World*, vii.

5 See Michel Foucault, *The Order of Things. An Archeology of the Human Sciences*, trans. Alan Sheridan (Vintage Books, 1994).

6 Tsing, *The Mushroom at the End of the World*, 27.

7 Researchers found that land plants evolved 700 million years ago, while land fungi evolved 1.300 million years ago. See Daniel S. Heckman, David M. Geiser, Brooke R. Eidell, Rebecca L. Stauffer, Natalie L. Kardos, S. Blair Hedges, "Molecular Evidence for the Early Colonization of Land by Fungi and Plants," *Science* 293/5532 (August 10, 2001): 1129–1133. https://doi.org/10.1126/science.1061457. Given the fact that fungi colonized the Earth long before plants and animals, the notion of *funga* is surprisingly young. After it had been used in the life sciences since the 2000s, it was first officially proposed in 2018 to support the implementation of education and conservation goals. See Francisco Kuhar, Giuliana Furci, Elisandro Ricardo Drechsler-Santos, Donald H. Pfister, "Delimitation of Funga as a valid term for the diversity of fungal communities: the Fauna, Flora & Funga proposal," *IMA Fungus* 9/2 (December 1, 2018), *Springer Science & Business Media*: A71–A74. https://doi.org/10.1007/bf03449441.

8 Tim Ingold in conversation with Una Meistere, "Anthropology, art and the mycelial person" (July 15, 2020), https://spiriterritory.com/conversations/interviews/24992-anthropology_art_and_the_mycelial_person/.

9 Ingold, "Anthropology, art and the mycelial person."

10 Yasmine Ostendorf-Rodríguez, *Let's Become Fungal! Mycelium Teachings and the Arts. Based on Conversations with Indigenous Wisdom Keepers, Artists, Curators, Feminists, and Mycologists*, with illustrations by Rommy González (Valiz, 2023), 6.

11 The notion of "wood wide webs" was coined by Canadian forest ecologist Suzanne Simard in the late 1990s. See Suzanne Simard, *Finding the Mother Tree. Discovering the Wisdom of the Forest* (Knopf Doubleday Publishing, 2021).

12 Roger Caillois, "Mimicry and legendary Psychasthenia," in *The Edge of Surrealism. A Roger Caillois Reader*, ed. Claudine Frank, trans. Camille Naish (Duke University Press, 2003), 91–103, 100. As for a historical analysis of invisible and dark spaces, see Robert MacFarlane, *Underland. A Deep Time Journey* (Penguin Books, 2019).

13 See above, note 1.

14 Some major exceptions include, only to mention two examples, yeast cultivation and the discovery of penicillin. Note that the official 1928 discovery of the antibiotic effect of penicillin by the British physician and bacteriologist Alexander Fleming was in fact a rediscovery, as the Italian physician and microbiologist Bartolomeo Gosio had already isolated mycophenolic acid from a mold of the genus Penicillium as early as 1893 and observed that it could inhibit the growth of the anthrax pathogen. Moreover, there is also evidence of the use of antibiotic substances in earlier cultures and even in the animal kingdom.

15 See Michael Pollan, *How to Change your Mind. What the New Science of Psychedelics Teaches Us About Consciousness, Dying, Addiction, Depression, and Transcendence* (Penguin Press, 2018), chapter III.

16 According to estimates, it is only around 6% of up to 3.8 million suspected species of fungi that are known to date. See Merlin Sheldrake, *Entangled Life. How Fungi Make Our Worlds, Change Our Minds and Shape Our Futures* (Random House, 2021), 11.

17 See Simard, *Finding the Mother Tree*; Paul Stamets, *Mycelium Running. How Mushrooms Can Help Save the World* (Ten Speed Press, 2005); Peter McCoy, *Radical Mycology. A Treatise on Seeing and Working with Fungi* (Chtaeus Press, 2016); Pollan, *How to Change your Mind*; Sheldrake, *Entangled Life*.

18 Allison Mackey and Elif Sendur, "What is Fungal Turn? Explorations and Interview with Sherryl Vint and Alison Sperling," *Interconnections: Journal of Posthumanism* 3/2: *Fungal Turn* (2024): 4–17, 5. https://doi.org/10.26522/posthumanismjournal.v3i2.4864.

19 Murray Bookchin, "Introduction to the 1991 edition" in *The Ecology of Freedom. The emergence and Dissolution of Hierarchy*, revised edition of the 1982 original publication (Black Rose Books, 1995), xii–lxi, xvii and xxiii. As for Bookchin's concept of "social ecology," see Bookchin, "Introduction to the 1991 edition," xiv: "In contrast to pragmatic environmentalism, I advanced a comprehensive body of ideas that I call social ecology. For social ecologists, our environmental dislocations are deeply rooted in an irrational, anti-ecological society, a society whose basic problems are irremediable by piecemeal, single-issue reforms. I tried to point out that these problems originate in a hierarchical, class, and today, competitive capitalist system that nourishes a view of the natural world as a mere agglomeration of 'resources' for human production and consumption."

20 Gilles Deleuze and Félix Guattari, *A Thousand Plateaus. Capitalism and Schizophrenia II*, trans. Brian Massumi (University of Minnesota Press, 2005), 4. As for the concept of the "rhizome," see Deleuze and Guattari, *A Thousand Plateaus*, "Introduction: Rhizome," 3–25.

21 Consider mycorrhiza (from the ancient Greek mýkēs 'fungus' and rhiza 'root'), a form of symbiosis in which a fungus collaborates with the fine root system of a plant. The fact that fungi and mycelial networks are indeed only mentioned sporadically in *A Thousand Plateaus* is arguably less due to a lack of interest on the part of the authors than to the fact that fungi were still scarcely represented in interdisciplinary discourse when the book was written.
22 Deleuze and Guattari, *A Thousand Plateaus*, 3–4.
23 Deleuze and Guattari, *A Thousand Plateaus*, 10.
24 Deleuze and Guattari, *A Thousand Plateaus*, 2–3.
25 As for the special attraction of "*true* ruins," also see Roger Caillois, *Le Fleuve Alphée* (Gallimard, 1978), 31–34 (quote: 34). German edition: *Der Fluss Alpheios*, trans. Rainer G. Schmidt, eds. Anne von der Heiden and Sarah Kolb (Brinkmann & Bose, 2016), 20–22 (quote: 22).
26 Tsing, *The Mushroom at the End of the World*, 1.
27 "Nothing more than mushroom identification develops the powers of observation," John Cage stated in 1959 by citing the words of his colleague Prof. MacIvor from The New School of Social Research in New York. Cited in John Cage, *A Mycological Foray*, ed. Ananda Pellerin (Atelier Éditions, 2020), 32.
28 Cage, *A Mycological Foray*, 55. It is important to note that this form of transience does not affect the fungus as a whole, as mycelia can survive for enormous periods of time and even divide into several independent 'individuals.' In fact, this radical transience only affects the ephemeral fruiting bodies, the sexual organs of the fungus.
29 Deleuze and Guattari, *A Thousand Plateaus*, 471.
30 Deleuze and Guattari, *A Thousand Plateaus*, 238. Deleuze and Guattari speak of various "blocks of becoming" (like the one of "a tree, a fly, and a pig," which is incited by a truffle mushroom), highlighting that each of these blocks "involves terms that are entirely heterogeneous" in that it builds on "combinations [that] are neither genetic nor structural." See Deleuze and Guattari, *A Thousand Plateaus*, 242.
31 Volker Grassmuck, "The Sharing Turn: Why we are generally nice and have a good chance to cooperate our way out of the mess we have gotten ourselves into," in *Cultures and Ethics of Sharing / Kulturen und Ethiken des Teilens*, eds. Wolfgang Sützl, Felix Stalder, Ronald Meier, and Theo Hug (Innsbruck University Press, 2012), 17–34, 18.
32 Wolfgang Sützl, Felix Stalder, Ronald Meier, and Theo Hug, "Introduction," in *Cultures and Ethics of Sharing*, 7–10, 7.
33 Roger Caillois, "A New Plea for Diagonal Science," in *The Edge of Surrealism. A Roger Caillois Reader*, ed. Claudine Frank, trans. Camille Naish (Duke University Press, 2003), 343–347, 347. The original French text titled "Nouveau plaidoyer pour les sciences diagonales" was first published in Roger Caillois, *Cases d'un échiquier* (Gallimard, 1970), 53–59.
34 Tim Ingold, *Lines. A Brief History* (Routledge, 2007), 4. Given that Ingold's father was a mycologist, it is no coincidence that his history of lines is closely related to the phenomenology of fungi. See Ingold, *Lines,* 41.
35 Ingold, *Lines*, 4.
36 Tim Ingold, *Being Alive. Essays on Movement, Knowledge and Description* (Routledge 2011), 63. Note that the notion "web of life" reappears in Merlin Sheldrake's 2023 film *Fungi: Web of Life*, which was filmed in Tasmania's Tarkine rainforest and narrated by Björk.
37 Ingold, *Being Alive*, 14. See Deleuze and Guattari, *A Thousand Plateaus*, 202.
38 Deleuze and Guattari, *A Thousand Plateaus*, 90.
39 Ingold, "Anthropology, art and the mycelial person," n. pag.
40 This passage refers to one of the workshops within the project *The Lure of Mycelial Space. Sharing Knowledge with/through Mushrooms*, organized by Ilka Becker, Sarah Kolb, and Jutta Strohmaier within the artistic-scientific conference *Traversing Topologies: Imagining Worlds and Knowledge with/through Artistic Research*, Entlebuch Biosphere and Lucerne University of Applied Sciences and Arts, September 2021. Many thanks to the participants: Maia Gusberti, Marion Neumann, Alison Pouliot, Olivier Rossel, Berit Singer, and Dila Suay. More information: www.mycelial-space.net/blog/the-lure-of-mycelial-space. The workshop series laid the foundation for the ongoing transdisciplinary project and the collaborative platform www.mycelial-space.net, which went online in April 2022.
41 This passage refers to the collaborative workshop *Parliament of Lines* by Sarah Kolb and Jutta Strohmaier on occasion of the ELIA Biennial "Arts Plural," Nuova Academia di Belli Arti, Milan, November 2024. The workshop's title is inspired by Tim Ingold's *Lines.*
42 Virginia Held, *The Ethics of Care: Personal, Political, and Global* (Oxford University Press, 2006), 3.
43 Held, *The Ethics of Care*, 3–4.
44 Held, *The Ethics of Care*, 13.
45 Held, *The Ethics of Care*, 14. The image of the mushroom is drawn from Hobbes's *Elementorum philosophiae sectio tertia de cive* (1642), see Thomas Hobbes, *The Citizen: Philosophical Rudiments Concerning Government and Society* (Doubleday, 1972), 205.
46 Hobbes, *The Citizen*, 205. Hobbes's original text reads "homines tanquam si essent iamiam subito e terra fungorum more (*like mushrooms*) exorti et adulti, sine omni unius ad alterum obligatione" (my translation).
47 Federico Zappino and Brunella Casalini. "Fungorum More: The Concept of Interdependence from Hobbes to Butler," *Diacritics* 51/4 (2023), 8–34, 24–25. https://dx.doi.org/10.1353/dia.2023.a948428.
48 See Michael Tomasello, *Why We Cooperate* (Boston Review, 2009), 3–13.
49 Ostendorf-Rodríguez, *Let's Become Fungal!*, 8–9.
50 See Paolo Freire, *The Pedagogy of the Oppressed*, trans. Myra Bergman Ramos (Continuum International Publishing, 2005), 141: "It is in the interest of the oppressor to weaken the oppressed still farther, to isolate them, to create and deepen rifts among them. This is done by varied means, from the repressive methods of the government bureaucracy to the forms of cultural action with which they manipulate the people by giving them the impression that they are being helped."

51 Ostendorf-Rodríguez, *Let's Become Fungal!*, 82.
52 Carolina Caycedo as cited in Ostendorf-Rodríguez, *Let's Become Fungal!*, 82 and 85.
53 Lucia Monge as cited in Ostendorf-Rodríguez, *Let's Become Fungal!*, 30.
54 As for the fundamental ethical standards, it is important to prioritize engagement with fungal strains sourced from nature, ensuring respect for biodiversity and minimal environmental impact. At the same time, any form of research should be committed to preventing the introduction of non-native strains into natural habitats to guarantee the protection of ecological balance.
55 See Jacques Rancière, *The Ignorant Schoolmaster. Five Lessons in Intellectual Emancipation*, trans. Kristin Ross (Stanford University Press, 2007).
56 The international grassroots movement owes much to the ongoing project Radical Mycology, initiated by Peter McCoy in 2006. See McCoy, *Radical Mycology*.
57 Internationally, a large number of scientific and artistic projects investigate new sustainable technologies based on mycelium. Examples include www.spun.earth, www.openfung.org, www.eurofung.org, www.mycoworks.com, and many others.
58 The verb *to curate* is derived from Latin *curare*, which means "taking care of" or "looking after." Among other recent events and publications, see the workshop series at the University of Arts Linz *TAKE CARE! Sorge tragen im Kunstsystem*, curated by Anne von der Heiden and Anna-Viktoria Eschbach, since 2024.
59 This passage refers to the exhibition *Try, Feel, Fail. Learn. Think. Play. Observe*, curated by Sarah Kolb and Jutta Strohmaier on occasion of the Wiener Pilzfestspiele (Vienna Fungi Festival), Viktoria – Space for Artistic Research and Social Design, September 2023. Many thanks to the artists: Paula Flores, Taro Knopp, Mouldelling Design aka Theresa Hajek, Samire Gurgurovci, and Salma Shaka, Jonas Studer, and Kristin Weissenberger. More information: www.mycelial-space.net/blog/try-feel-fail-learn-think-play-observe.
60 The initial spark for the project was our proposal for the workshop series *The Lure of Mycelial Space* within the *Traversing Topologies* conference in 2021, see above, note 40. As for the ongoing activities within the project, see www.mycelial-space.net.
61 See above, note 52.
62 In his "synthesis of relational, ecological and developmental approaches," Tim Ingold similarly distinguishes between the three categories of "livelihood" (as related to sensing in terms of "comprehending how human beings relate to their environments"), "dwelling" (as related to sharing, since "awareness and activity are rooted in the engagement between persons and environment") and "skill" (as related to caring "conceived as the embodiment of capacities of awareness and response by environmentally situated agents"). Tim Ingold, *The Perception of the Environment: Essays on Livelihood, Dwelling, and Skill* (Routledge, 2002), 5.
63 See Andreas Reckwitz, *Verlust. Ein Grundproblem der Moderne* (Suhrkamp, 2024).