

Imagining the Spore-Apocalypse

Re-Thinking Autonomy, Agency, and Actor-Networks Through the Fungal Zombie

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Abstract *The chapter explores how fungal zombies challenge anthropocentric notions of agency and offer a framework for rethinking agency in posthuman terms. Using HBO's television series *The Last of Us* (2023) and Mike Carey's *Hungries* novels as case studies, it suggests that by merging zombies and fungi, these narratives reveal the interconnectedness of all life forms and suggest that human survival is precarious in the face of anthropogenic changes to environmental networks.*

Introduction: Human, Vegetal, and Fungal Agencies

Fungal zombies destabilise traditional anthropocentric conceptions of agency and can help us re-think agency in posthuman terms. Taking the HBO's television series *The Last of Us* (2023) and Mike Carey's *Hungries* novels as examples, this chapter probes fungal zombies' potential usefulness as a trope in the environmental discourse. I will show that fungi and zombies are a potent pairing. The will-less, decaying, disintegrating zombie has always served as a reminder that to be human is to be a material, mortal body rather than a divine soul or rational agent (Lauro and Embry 2008, 90). Thus, zombies challenge dominant Western conceptions of the human that serve to legitimise the anthropocentric, unequal, and exploiting relationships humans have been entertaining towards the nonhuman world. Fungi are random (Crane 2021, 239), uncontrollable, resilient (Lowenhaupt Tsing 2015, 3), and ambiguous. They defy boundaries and categorisation (Sheldrake 2020, 15), and they are agential (Rich 2023,

2). In such ways, fungi “challenge us to reassess the metaphors and models we use to navigate the world” (DeVries 2018, n. p.). Fungi can teach us about the vitality of matter, kinship, and collaboration (DeVries 2018, n. p.), and they reveal that human existence in a world marked by anthropogenic alterations of actor-networks is precarious. By fusing the zombie and fungi into one figure, Carey’s novels and *The Last of Us* remind their readers and viewers that all life on earth becomes possible through networks of intricately entangled animal, plant, fungi, bacterial, material, and other agents, which shape each other’s actions, agencies, and futures. They further suggest that the anthropogenic alterations of the environment that change the conditions in which current actor-networks have evolved and are functioning may render the future of humankind precarious.

When I think about fungi, I usually think about the tasty porcini that my father and I used to forage in the local forest; I think about the yeast that I use when baking; I think about the hallucinogenic magic mushrooms that my former flatmate used to consume; I think about the comic super-mushrooms in my son’s *Super Mario* videogames. In short, when I think about mushrooms, I usually think about them as objects for human consumption (whether they are consumed as food, drugs, or popcultural items), but rarely do I think of them as dynamic, vibrant, and lively actors that bring about historical, environmental, or material changes and that make vegetal, animal and human life possible. Yet, that is exactly what fungi are and what they do. As biologist Lynn Margulis points out, terrestrial life only became possible because fungi and plants formed a symbiotic relationship that allowed plants to become landlocked (1998, 107). Millions of years later, fungi kick-started the growth of forests after a big meteor impact and, in so doing, facilitated the expansion of mammals and humans, which thrive in forest environment (Rich 2023, 50). Examining the deep history of life on earth, we start to see that without fungi, life would be impossible. Fungi continue to facilitate the growth and well-being of forests. Mycorrhiza, underground networks of plant roots and fungi, facilitate the exchange of nutrients and water among a forest’s plants and fungi. Around 90% of all known plant species depend on their symbiotic relationships with fungi (Sheldrake 2020, 4). Fungi are also a vital part of the human gut microbiome and regulate their hosts metabolism and immune responses, among other things. As mycologist Merlin Sheldrake aptly summarises, “fungi are everywhere but they are easy to miss. They are inside you and around you. They sustain you and all that you depend on. As you read these words, fungi are changing the way that life happens” (2020, 3).

Yet, even though fungi are vital, life-bringing agents, we often conceive of them as “lowly nutritive souls, feeding and reproducing but fully incapable of either sensation or reason” (Rich 2023, 12). And we think of them as resources that we can use to “solve a range of [humans’] pressing problems” (Sheldrake 2020, 8). Hence, fungi have been used as medicine to heal infection, as kindle to light a fire, to bake bread, to make drinks fizzy, and to make alcohol. More recently they have been used to clean bodies of water from spilt oil (mycoremediation), or to create radiation-resistant biomaterials, among other uses (Sheldrake 2020, 8–10). The ways in which we see and use fungi is, in fact, not dissimilar to how we understand the vegetal world. Like fungi, Giovanni Aloï points out, plants are usually perceived as fixed, passive, resilient, and silent (2014a, xxiii). In the same vein, John Charles Ryan contests that the master narrative about the vegetal world understands “botanical life as sessile (unmoving), silent (lacking address), passive (acted upon by mobile life-forms), and, of course, pleasing (agreeable to the senses)” (2018, 1). Aloï writes, that “these reductionisms have been used to assess plants’ ontological inferiority towards animals and even more so, humans” (2014a, xxiii). Based on the notion that plants are inert resources at humans’ ready disposal, humans have planted, grown, cultivated, yanked out, used, consumed, destroyed, and disposed of earth’s vegetation at their will (Haas 2022, 70).

Such conceptions of plants and fungi go hand in hand with an understanding of agency that conceptualises it as exclusive to humans. Ancient philosophy, humanism, and the modern sciences have typically conceived of the human as a “self-willed, individual agent” (Nayar 2014, 4); a subject defined by its cognitive and emotive capacities of “rationality, authority, autonomy, and agency” (5). These capacities were usually seen as exclusive to humans, whereas nonhuman entities—including nonhuman animals, plants, fungi, bacteria, viruses, and others—were defined on the basis of their supposed lack of liveliness, intention, and agency (Braidotti 2013, 15). These conceptions have “situated the human *above* other life forms, and in control of them” (Nayar 2014, 3) and they have justified the oppression, exploitation, and destruction of those entities that were regarded as ‘other’ and were “reduced to less than human status of disposable bodies” (Braidotti 2013, 15). Especially plants and fungi have traditionally been regarded as lifeless, inert, and disposable matter (Aloï 2014a, xxiii; Haas 2022, 70; Rich 2023, 12) and their vitality and agency, through which they have made life on earth possible (Margulis 1998, 107; Rich 2023, 50), has largely been disregarded.

In the Anthropocene, in which humans have profoundly altered the environmental and material conditions in which life on earth as it is right now could develop and thrive, and in which the diversity of plant species is rapidly declining, reductionist and anthropocentric conceptions of human and non-human agency must be scrutinised and re-evaluated. The idea that plants and fungi are passive, disposable, and non-agential resources fails to acknowledge that they constitute “integral, coexisting *actants* that play defining roles in the functioning of ecosystems on this planet” (Aloi 2014a, xx; Sheldrake 2020, 3; Rich 2023, 2), which is why the well-being and existence of countless other life forms, including human life, depend on the well-being of both the vegetal and the fungal world. Accordingly, to come to terms with the changes in the human-plant relationships that were brought about in the Anthropocene and in order to form new understandings of plant and fungi agency it is necessary to upturn our common conceptions of them (Aloi 2014a xxiii), and to find “new modes of attention and crafting new modalities of perceptions” (Aloi 2014a xx). The fungal zombie has the potential to do so.

Posthuman criticism has scrutinised anthropocentric conceptions of human agency and argued for a re-thinking of the concept. As Vanessa-Nadine Sternath, Silvie Lang, and Christine Riess outline in their introduction to this volume, Bruno Latour’s deliberations on actor-networks constitute a particularly influential and productive theory to dismantle the notions of agency that conflate it with intention, autonomy, and rationality, and hence with human subjecthood. Latour proposes that possibilities to act and frameworks for actions are engendered and shaped by networks of different human, nonhuman and material entities over which humans have no control (2022, 88). In reference to Latour, Gabriele Dürbeck, Caroline Schaumann and Heather Sullivan write that “human choices are determined by specific cultural and material circumstances” (2015, 119). Actor Network Theory (ANT) suggests that agency does not come from within an individual, it is not intentional, or straightforward but emerges out of intricate interspecies and material entanglements, and thus, is incidental, situational, entangled and reciprocal. This understanding of agency further destabilises the notion that agency is an exclusively human capacity. ANT understands agency as distributed among humans, nonhuman live forms, including plants and, as I would stress, fungi. Dürbeck, Schaumann and Sullivan propose that we “broaden our understanding of agency to include the activities of all living things as well as matter’s vibrant energies” (2015, 121) and to think of agency as “a distributed, emergent force that can create order or disorder with or without intentionality” (2015, 122).

Such posthuman conceptions of agency destabilise hierarchical subject-object relationships, which construct humans as actors and nonhumans as acted upon. What is more, by suggesting that human life is “an instantiation of a network of connections, exchanges, linkages and crossing with all forms of life” (Nayar 2014, 5), they draw attention to the fact that the anthropogenic alterations that characterise the Anthropocene undo and redo the material conditions in which current interspecies networks have developed and stabilised; they help us understand that these alterations have created new opportunities for several nonhuman actors, including plants and fungi (Sheldrake 2020, 8). In the following sections, I will explore how the fungal zombies and the imagined spore-apocalypse in Carey’s novels and in *The Last of Us* undo traditional anthropocentric conceptions of agency, especially those that conflate agency with individuality, autonomy, and intentionality. And I will consider how these texts can prompt an understanding of agency as distributed among nonhuman entities, dependent on material conditions, and, thus, as relational, reciprocal, and situational.

Fungal Minds: Agency without Autonomy

In 1859, British naturalist Alfred Russel Wallace discovered the *Ophiocordyceps unilateralis*, which today is more commonly known as the Brazilian zombie-ant fungus. *Ophiocordyceps* has the ability to infect ants, hijack their central nervous systems, and manipulate their behaviour to help the fungus reproduce. The fungus causes the ant to climb up plants and secure itself to a leaf, where the ant dies. Upon its death, the fungus grows hyphae into the ant’s tissue until a mushroom erupts from the insect’s head and releases *Ophiocordyceps* spores. *Ophiocordyceps* is not the only fungus known to manipulate the minds and behaviours of other beings – though, because it appears to assume complete control over its host and usually ends with the host’s death, it is probably the one that most easily horrifies. Several other types of fungi – for instance, *Psilocybe cubensis*, which is vernacularly referred to as the ‘magic mushroom’, ergot mushrooms, and toadstools – all contain biochemicals, like psilocybin, that affect the human mind and can cause states of ecstasy and hallucinations. Sheldrake suggests that when humans are under the influence of psilocybin, their consciousness and behaviour becomes, at least partly, fungal; their altered states become an extended phenotype of the fungus (2020, 122) – so that, temporarily, their state of mind is not entirely dissimilar to that of ants in-

fected with *Ophiocordyceps*. In the zombie ant and the bemushroomed human brain the boundaries between human and fungi agency are blurred, calling into question long-cherished ontological and anthropocentric conceptions of agency, especially those that conflate agency with individuality and autonomy. The concepts of autonomy and agency are interconnected, but they describe different facets of agency. A subject's ability to make choices free from external influences and to be self-governed is usually described as autonomy – an ability that ants infected with *Ophiocordyceps* appear to lose. Whereas humanist, anthropocentric notions often conflate agency with autonomy, a posthuman understanding of agency would conceive of it in more general terms as ability to act and bring about change and influence the actions and behaviours of others.

Both *The Last of Us* and Carey's *Hungries*-duology – comprising *The Girl with All the Gifts* (2014) and *The Boy on the Bridge* (2017)¹ – have taken inspiration from these mind-altering fungi. In Carey's novels and in *The Last of Us*, the zombie apocalypse is brought about by the *Ophiocordyceps*-fungus, which is imagined to have developed the ability to grow not only into ant's but also into human's brain and nervous system and, in so doing, take control over its host's mental facilities and behaviours. Driven by unsatiable hunger for human flesh – hence the so-called Hungries in Carey's novels – *Ophiocordyceps*' human host behaves and acts in the service of the fungus, which is nourished through its host's consumption of human flesh and which spreads its spores onto other humans through its host's saliva and blood. *Ophiocordyceps*' methods turn out to be very successful so that in *The Last of Us*, *The Girl* and *The Boy* every human is always on the verge of losing their individual subjecthood to become one with the fungus and to have their consciousness, autonomy, and free will dissolved.

In the *Hungries*-duology and in *The Last of Us*, fungal zombies usually appear as large inanimate hordes, they are described as "sleepwalkers" waiting to be woken up (*The Boy* 25). They do not move until they are triggered by external rather than internal stimuli. Only upon registering rapid movements, smell, noise or body temperature, are they pushed from a passive to an active state (*The Boy* 27) – hence they appear to lack any form of autonomy over their actions. What is more, because they are usually part of a horde, fungal zombies cease to have any form of individuality. This impression is strengthened by the fact that, in *The Last of Us*, all zombies are connected through networks of hyphae, which grow over- and underground and can assemble zombies into

1 I will henceforth abbreviate the novels as *The Girl* and *The Boy*.

hordes or trigger the horde to change their location. Hence, in the spore-apocalypse becoming zombie equates with losing the autonomy and individuality that we traditionally perceive as making us humans, as making us agents. Yet, losing their autonomy does not equate with them losing their ability to bring about change, and, hence be agential. Most importantly, fungal zombies have the ability to infect humans with *Ophiocordyceps* and, in so doing, make humans one of them. Moreover, they are an omnipresent feature of the post-apocalyptic space and determine how humans perceive, navigate and move through that space attempting to avoid or escape zombies – I will return to this later.

However, it is important to point out that whereas the fungal zombie is portrayed as lacking autonomy, *Ophiocordyceps* itself is frequently described as having an agenda and the capacity to act on it, so as autonomous. For instance, in *The Girl*, Dr Cardwell describes the fungus as “know[ing] what it wants”; as “the captain of this sinking ship” (42) – by which she means its human host’s consciousness. Later in the novel it is described as having “an agenda” (*The Girl* 431), which is to take control over its human host and to increase its proliferation. As Sheldrake points out, fungi are capable of sophisticated behaviours, they can solve problems, communicate, and make decisions (2020, 16), thus, they are agential, maybe even autonomous. Once more, the Brazilian zombie-ant virus that the fungal zombie is inspired by serves as an illustrating example. Infected ants do not simply climb onto any leaf to die, but scientists located the dead infected ants “25.20 ± 2.46 SE cm above the ground, where the humidity and temperature were optimal for fungal growth, and on the north-northwest side of the plant biting onto a vein of the leaf” (Anderson and Hughes 2012, 163) – a fact that suggests that *Ophiocordyceps* controls the ant’s behaviours and movements in “highly specific” and sophisticated ways (163). Yet, the fungus’ capability to act in sophisticated and agential ways tends to be overlooked because it does not comply to traditional anthropocentric definitions of intelligence and agency (Sheldrake 2020, 16). Or, if fungal agency is acknowledged, it is often configured as malevolent precisely because it threatens to “decentre, destroy or supplant the human” (Gruss 2022, 87), as Susanne Gruss has argued in reference to British eco-gothic texts (cf. also Crane 2021, 250). This fear of fungal agency, which decouples the concept from its anthropocentric conflation with autonomy and individuality, is also reflected in Carey’s novels and *The Last of Us*.

The fear of becoming one with both *Ophiocordyceps* and the zombie horde, of losing one’s autonomy and individuality is what appears to haunt most of the novels and series’ human protagonists. Upon being bitten by a zombie,

Sam asks Ellie, “If you turn into a monster is it still you inside?” (“Endure and Survive” 0:51:56-58) – a question that leaves it up to interpretation whether the young boy is more afraid of losing his sense of self or of retaining some level of consciousness while his behaviours and actions are being controlled by *Ophiocordyceps*. Either way, most of the protagonists perceive turning into a fungal zombie a fate even worse than death. Hence, upon being infected with *Ophiocordyceps*, Sergeant Parks asks Melanie to shoot him before he turns into a zombie (*The Girl* 454), Tess blows herself and a horde of zombies up (“Infected” 0:49:36-0:50:45), and Sam’s story resolves in a bittersweet way when his older brother shoots Sam and then himself (“Endure and Survive” 0:54:40-0:55:48). All these characters prefer death over succumbing their autonomy to the fungus.

Andy Lee makes a similar observation in his article about the videogame that *The Last of Us* is based on. Lee points out that losing one’s subjecthood to the fungus is depicted as even worse than dying (2013, 48). He emphasises that the videogame mostly revolves around the micro-decisions that its characters can make and presents their sense of ownership over themselves and their actions as the only thing that human characters can hold on to in the fungal apocalypse (49). The series re-iterates a similar narrative structure that is determined by its main characters’ actions, decisions, and their consequences. This is also true for Carey’s novels, whose plot is compelled forward by its main characters’ – often inconsiderate, selfish, and outright stupid – decisions and actions. Particularly, the end of *The Last of Us* illustrates that, even though humans tend to make bad decisions that often have disastrous consequences, their ability to do so autonomously and independently is still regarded as one of their most important abilities. At the end of the series, Joel and Ellie arrive at The Fireflies² research facility. After Joel hands Ellie over to The Fireflies’ team of scientists, he learns that they plan to kill Ellie and dissect her brain to create a vaccine against *Ophiocordyceps* (“Look for the Light” 0:25:40-0:26:31). Upon learning so, he storms into the surgery, removes Ellie from the surgeons’ table, shoots the team of surgeons and everyone else who threatens to stop him, and flees with Ellie (“Look for the Light” 0:30:14-0:35:05). As Ellie is the only person known

2 The Fireflies are a militia group that revolt against FEDRA’s (a governmental military group) rule in most quarantine zones. The Fireflies have a team of scientists that is searching for a vaccine against infection with *Ophiocordyceps*. The series’ plot follows Joel taking Ellie to the Fireflies’ research facility in the hope that with Ellie’s help – who is immune to the infection – the Fireflies can create a vaccine.

to be immune to *Ophiocordyceps*, by saving Ellie, Joel ultimately condemns the rest of humanity. Joel's decision and subsequent action might be ethically reprehensible, but, in a world in which fungal agents threaten to dissolve human individuality, autonomy, and agency, Joel's ability to make an autonomous decision and act upon it, offers a sense of comfort to himself and maybe also to readers that have internalised the notion that to be a human agent is to possess autonomy. As Lee concludes in reference to the videogame, in *The Last of Us* the fungal zombie symbolises a "threat to the individuated subject and liberal-humanist notions of possessive individualism" (2013, 47), a threat that is retorted by the series' seemingly centralising of the human individual, which manages to obtain its ability to make autonomous – if questionable – decisions.

Yet, an argument could also be made that Joel's sense of autonomy is illusory and that his decisions and actions are guided and shaped by the material conditions of the post-apocalyptic world he inhabits and by his relationships with other people. In the spore-apocalypse, the environment has become inhospitable for humans: zombies lurk behind every corner threatening to attack, so are renegade, violent groups of survivors, cities are overgrown with mushrooms and plants, and large parts of the city are flooded. As Joel and his travel companions move around this post-apocalyptic world, they have to navigate its lurking dangers and misanthropic environments, and are often forced to take detours on their way to avoid dangers, to sacrifice people dear to them, to fight and kill enemies, and so forth. That is, their decisions and actions are shaped by the post-apocalyptic actor-networks of which they have unwillingly become a part. And even though they make decisions and take actions, their effects and results are beyond their control. For instance, when Joel, Tess, and Ellie travel through the ruinous remains of Boston, they encounter a large horde of fungal zombies, which forces them to take a detour from the planned travel route and go through the Bostonian Museum ("Infected" 0:27:18–0:28:45). Though the museum appeared to be them as the safest travel route, it holds more unexpected dangers. In the museum, the trio is attacked by a zombie, Tess gets bitten and infected and later kills herself ("Infected" 0:35:00–0:39:10).

Within a framework more attuned to relational agency, we can also recognise Joel's decision to save Ellie as not entirely autonomous. Rather, it arises out of the relationship he has grown with Ellie throughout their journey through the spore-apocalypse – a journey that brought them closer because they had to repeatedly save each other's lives and were forced to be vulnerable in front of each other. Hence, agency in *The Last of Us* never appears to be based on humans'

autonomous decisions and actions, but emerges out of reciprocal relationships between human and nonhuman entities, including other characters, zombies, fungi, plants, and the material conditions of the post-apocalyptic space.

The *Hungries*-duology takes this destabilising of anthropocentric conceptions of agency even further through its depiction of human-fungus symbionts, in which distinctions between human and nonhuman agency almost completely dissolve. The plot of both novels revolves around human survivors' encounters with several children that, despite being infected with *Ophiocordyceps*, seem to have retained some sense of self, and the ability to act rationally and morally. At the same time, these children also have some fungal instincts, which they seem to be unable to control. Particularly the smell of humans triggers an uncontrollable hunger in these children, which prompts them to attack and bite uninfected humans. In *The Girl*, the child-age Hungries are being imprisoned in a military camp to be studied, examined, and dissected by a team of scientists. And in *The Boy* a team of scientists scouting the spore-apocalyptic Britain encounters groups of child Hungries on various occasions. As readers find out in *The Boy*, the children's seeming immunity to *Ophiocordyceps* is not really an immunity – if by immunity we mean that their bodies and brains resist infection. These children do not turn fully into zombies because their brains and bodies have formed a symbiotic relationship with *Ophiocordyceps*; their brains and *Ophiocordyceps* have literally fused and become one (*The Girl* 432, *The Boy* 233). In *The Boy*, the young scientist Stephen asks upon studying the brain of a child Hungry: “So who is in charge here? The human or the fungus?” (*The Boy* 234) – a question that remains (deliberately) unanswered and that invites a reading of the child-age Hungries' agency as emerging out of the reciprocal relationship between the children and *Ophiocordyceps*.

Some chapters with narrative focalisation through Melanie, one of the child-age Hungries, give further insight into how the novels blur the boundary between human and fungal agency. At first sight, Melanie comes across as a normal human girl – she is somewhat naïve, has a strong affection for her teacher, she is curious and clever, she is empathetic, and she can articulate herself very well – but, throughout the novel, it becomes increasingly evident that the ways in which she perceives the world, some of the decisions that she makes, and actions that she takes often seem more fungal than human. It is often unclear whether Melanie's decisions serve her own (human) interests or that of the fungus; whether her actions are based on her human intentions or the intentions of the fungus, to the extent that these are seen as contradictory. When she kills and eats one of the Junkers, who attacks the military base and

threatens her much-loved teacher Miss Justineau, it is not clear whether she does so on behalf of Cordyceps' urge to proliferate or to protect her teacher (*The Girl* 128–129). Similarly, when she decides to release the airborne spores that, as she knows, will turn all remaining human survivors into fungal zombies, it is not clear whether she is fulfilling the fungus' plan to spread infection or her human moral reasoning (though her decision is similar to Joel's, it is represented as being informed by her ethical weighing and considerations rather than the lack thereof, as Melanie's conversation with the dying Sargent Park suggests). Melanie's decisions and actions often blur the boundaries between human and fungal agency suggesting that the ways in which she acts and behaves are the result of the intricate entanglements of human and fungi intentions and interests that emerge out of her symbiotic relationship with *Ophiocordyceps*. Gruss reads Melanie as a "posthuman who exceeds (and therefore endangers) her human forebears" (2022, 92). However, I would suggest that Melanie's symbiosis with *Ophiocordyceps* can be read as a metaphor illustrating that the human subject already is an assemblage of myriad organisms, including fungi, bacteria, viruses, and so on. That is: human agency always emerges out of the reciprocal entanglements between these different species that make the human and the countless other species, materials and conditions that co-inhabit the world with us. In so doing, *The Girl* balances its representations of nonhuman agency by portraying both its potential to decentre and threaten the human subject through the fungal zombie and, through the depiction of Melanie, by showing that our symbiotic relationships are also beneficial and generative.

Actor-Networks in the Anthropocene: Breaking and Making Worlds

The first scenes of *The Last of Us* show a fictional interview with an epidemiologist, recorded in the late 1960s. In the interview, Dr Neuman claims that if the global climate were to get slightly warmer, mind-controlling fungi like *Ophiocordyceps* would likely adapt to these warmer temperatures and, thus, be able to infect and survive in the 37°C warm human body. This, he predicts, may bring about the end of humankind ("When You're Lost in the Darkness" 0:01:01-0:03:11). The series proceeds by leaping about 40 years into the future, in which, indeed, global warming, coupled with the global infrastructures of turbo-capitalism, has caused *Ophiocordyceps* to mutate and to wipe out a substantial part of the human population. By depicting the spore-apocalypse as a result of cli-

mate change, *The Last of Us* gestures at one of the paradoxes that mark the idea of the Anthropocene and its underlying notion that humans have become the most powerful geological agents on earth.

As Dürbeck, Schaumann and Sullivan posit, the notion that humans can alter geological, chemical, atmospheric, and other processes assumes “straight-forward human agency and a new hubris” (2015, 120). However, this notion overlooks the fact that humans could only evolve to become geological agents in the particular environmental and material conditions of the Holocene. As environmental historian Dipesh Chakrabarty points out, the stable climate and the cyclical seasons of the Holocene have made it possible for humans to practice agriculture, settle down (2009, 217–218), and, eventually evolve in ways that provided them with opportunities to alter the global climate, the atmosphere, and so forth. Hence, in destabilising these environmental conditions, humans also alter the conditions in which they have thrived and survived. As Margulis highlights, humans are symbionts whose lives depend on their relationships with their nonhuman “planetmates” (1998, 111). To frame this in the terminology of ANT, humans “are a species living in conjuncture with [their] co-species and interacting with – not just impacting or controlling – the weather, the water flows, the landscapes [...] All of these things are active forces that impact our choices just as our choices impact their flows” (Dürbeck, Schaumann, and Sullivan 2015, 120). If these relationships change and the material conditions in which they have evolved change too, then the future of humankind becomes precarious, as we see in the fictional scenarios played out in *The Last of Us* and Carey’s *Hungries*-duology.

Yet, the end of humankind does not equate with the end of the world “in toto” (Hall 2016, 252). In fact, while the anthropogenic alterations of the environment may bring about the end of humankind, it may simultaneously provide new species, such as fungi, with new opportunities to evolve. Indeed, Sheldrake points out, some of the ways in which humans currently use the world have created opportunities for fungi to evolve, some of which may be harmful to humans (2020, 8). Especially, the depiction of the post-apocalyptic realm in *The Last of Us* and the *Hungries*-duology suggests, the unmaking of the human world through the fungus enables the resurgence of the fungal and the vegetal world. A recurring trope of the novels and the series depicts the proliferation of not only fungi but also the vegetal world. *The Last of Us* features several idyllic images that show urban spaces overgrown by lush vegetation (for instance E9 0:15:59–0:17:46), upon which Ellie remarks, “You can’t deny that view” (“Look for the Light” 0:17:57–59). Likewise, the protagonists in *The Girl*

and *The Boy* note the proliferation of the vegetal world in multiple instances (*The Girl* 37, *The Boy* 4). The description of Melanie's perception of the post-apocalyptic world provides an illustrative example:

Wild flowers surround her. [...] She registers the tiny buzzing things that fly between them and guesses that they're bees, because of what they're doing – visiting one flower after another [...]. Something much bigger flies across the field in front of her. A black bird that might be a crow or a jackdaw, its song a hoarse, thrilling war cry. Sweeter and softer songs weave around it [...]. The air is heavy with scents. Melanie knows that some of them are the scents of flowers, but even the air seems to have a smell – earthly and rich and complicated, made out of things living and things dying and things long dead. The smell of a world where nothing stops moving, nothing stays the same. (*The Girl* 140–41)

Notably, Melanie describes the world around her not only as idyllic but also as comprised of multiple vibrant, dynamic and interconnected nonhuman agents: the presence of flowers and the smells they emit attracts bees, which both feed on the flowers and enable their procreation; the bees, in turn, attract larger animals like birds, which feed on the insects. Melanie describes a world of reciprocal relationships, in which the lives and deaths of all beings mutually define each other.

The proliferation of the vegetal world in the absence of humans, which is often described in positive terms, constitutes a recurring trope in post-apocalyptic fiction, which, as Eva Horn suggests, represents a secret longing for a world that is lifted of the detrimental and destructive presence of humans and finds peace in the absence of humans (2018, 2). The trope suggests, as Matthew Hall puts it in reference to the plant horror novel *The Day of the Triffids* (1951), the end of the world that is imagined in *The Last of Us* and the *Hungries* novels, “is not the end of the world *in toto* but the end of human dominance of an instrumentalized nature” (2016, 252) – an imagination that can, indeed, be perceived as positive and hopeful.

Once more, fungi provide us with ways to think about the reciprocal relationships between different organisms through which death and decay are always rendered generative; ways that can make us understand death as an act of sharing (Rich 2023, 94). As Robert Macfarlane has posited, fungi are “world-makers and world-breakers” (2019, 94). Fungi play a vital role in mammalian cadaver decomposition. As they decompose bodies, they redistribute a body's

matter and energy to be absorbed by other organisms making these organisms' life possible (Rich 2023, 94). Hence, fungi render death "productive, generative, and even creative" (Rich 2023, 95). This ability of fungi has produced different reactions. As Sarah Rich points out, in early modern science, fungi have often been hailed for their capacity to grow out of decay (2023, 17). At the same time, early modern depictions of fungi have frequently shown them growing on mutilated human bodies (Rich 2023, 23). In the same vein, Kylie Crane argues that because of fungi's seemingly contradictory association with decay and healing, they often feature in horror-adjacent genres (2022, 472).

The depiction of the fungal zombie in *The Last of Us* and in the *Hungries*-duology draws on these ambiguous perception of fungi's world-breaking and world-making qualities. In *The Girl* the physical manifestation of this final stage of infection is described as follows:

The Hungries have fallen down in the middle of the street, or slumped at the base of walls [...]. From their split skulls and exploded heads, grey stems about six inches in diameter have sprouted like the trunk of trees. The stems grow straight upwards to incredible heights, and the threads pour out from them at all angles in endless proliferation. [...] There's nothing of humanity left in them, nothing to remind anyone that they were once alive. They're more like clothes that someone has taken off and left lying on the ground. (*The Girl* 418–19)

The fungal zombies in *The Last of Us* are depicted in similar ways: the bodies of the dead human hosts are overgrown with mycelia and spore-bodies, sprouting from within their bodies ("Infected" 0:36:03-04). The affect that such descriptions and images evoke is best understood through Julia Kristeva's concept of the abject. The abject describes an affective response to being confronted with the corporeal reality of the human body. It is a response to when we see human's precarious borders dissolve, for example when we see bodily fluids being excreted or decaying human corpses. As Kristeva suggests, the idea of the human autonomous subject is bound to a conception of the human body as an integral whole that is protected by several borders e. g., the skin (1982, 3). The fact that the human body is made up of multiple other microorganisms (Haraway 2008, 3–4), that it is porous and its borders are precarious (Kristeva 1982, 3) is deeply unsettling to us because it suggests that humans are not, or not only, autonomous subjects but also material objects (Kristeva 1982, 3–4) whose

decisions and actions are influenced by the live forms co-inhabiting the human body.

Dawn Keetly observes in reference to plant horror that whereas we often think of plants and fungi as sustenance of humans, the fact that all humans become sustenance for plants and fungi upon their death is deeply frightening to us (2016, 1). This reflects very well in many Western mourning rites. Upon death, the human body is buried in a coffin, which separates it from the earth surrounding it and from its decomposing organisms, and, thus, prolongs its decay. Yet, the fact that humans do become sustenance for plants, fungi, and other organisms constitutes an inescapable truth (1). The fungal zombie serves as an affective reminder of that. The bodies of the infected are not buried in coffins, but, after having done their part in spreading the infection, are “devoured by the fungus from within” (“When You’re Lost in the Darkness” 0:01:50-53). In Carey’s novels and *The Last of Us*, *Ophiocordyceps* dissolves the human body into nutrients and makes these available to other organisms, including other fungi, plants, bacteria, and so forth; the human becomes a material part of a network of multispecies actors, (unintentionally) facilitating the networks’ sustenance and growth. This does not mean that humans lose their agency upon death, rather, it suggests that agency takes on a different form – one that is not determined by autonomy and intentionality – as traditional humanist notions of agency would conceive of agency – but by its materiality. This materiality engenders the proliferation of other, nonhuman agents and, in so doing, renders humans an integral part of multispecies actor-networks. As Crane observes considering fungi’s ability to decompose the human corpse, “[f]ungi help us attend to the idea that what might seem like a body, an individual somehow separated from its environment, is rather itself a system through which matter is passing” (2022, 463). In so doing, fungi in general and the fungal zombie in particular destabilise concepts of the human that understand it as an autonomous agent, an individual body protected by borders, but as a material body, whose ability to bring about change lies in its materiality, which connects it to actor-networks comprised of countless nonhuman agents, including other animals, bacteria, viruses, and, of course, plants and fungi.

Conclusion

In her influential book *The Mushroom at the End of the World*, Anne Lowenhaupt Tsing contests that in times in which it becomes evident that all of humans’

“taming and mastering” of the nonhuman world “has made such a mess that it is unclear whether life on earth can continue” (2015, vii), mushrooms can offer us guidance (2). This article set out to probe this idea by investigating how fungal zombies can challenge some of the anthropocentric ways in which humans have conceived of their relationship with the fungal and the vegetal world, and of the agencies that emerge out of these relationships. Fungi and plants have traditionally been perceived of as passive, non-agential matter, that can be used, manipulated, controlled, and disposed of by human agents. Agency has been seen as a human emotional and cognitive capacity rather than one that is distributed among all organisms and material entities on earth. The idea of the Anthropocene—the man-made geological epoch—can easily be misinterpreted to affirm such anthropocentric conceptions of agency.

The spore-apocalypse imagined in *The Last of Us* and Carey’s novels serves to counter these affirmative notions. The fictional post-apocalyptic worlds of the *Hungries* novels and *The Last of Us* similarly suggest that anthropogenic environmental changes might not necessarily bring about the end of the world altogether, nor do they only bring about the end of the nonhuman world (as is often suggested in environmental discourse). Instead, as humankind continues to change the environmental conditions in which life has developed, they are undoing and redoing relationships and power dynamics between different species. The result of this may very well be that humans create a world that is inhospitable to humans but provides the parameters in which other species, like fungi, will thrive. The prospect of the spore-apocalypse serves as a cautionary tale against turbo-capitalism, human excess, techno-scientific hubris, and, most importantly, the disregard of humankind’s intricate entanglements with its fungal and vegetal planetmates – entanglements that can ensure our survival, or, if we continue the path that we are currently on, can engender our demise.

This scenario is not far-fetched. Lowenhaupt Tsing points out that the first thing that re-appeared in the nuclear wasteland of Hiroshima was the matsutake mushroom (2015, 3). Indeed, she continues, fungi are particularly resilient and often proliferate in environments that are inhospitable, sometimes even uninhabitable for other organisms (Lowenhaupt Tsing 2015, 3). Fungi have been historical agents in the past (Lowenhaupt Tsing 2015, 4; Margulis 1998, 107; Sheldrake 2020, 4; Rich 2023, 50) and they will likely continue to be so. Hence, the events in the fungal zombie imagination are not entirely improbable but extrapolate current risks and tendencies.

Ultimately, the fungal zombie reveals that humankind's fate is deeply intertwined with the nonhuman world, urging us to re-think how we conceive of and interact with those life forms that we have traditionally understood to be inert and disposable. In the course of the Anthropocene, it is the human that might end up being disposed of.

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