

THE MYCOLOGICALLY STRANGE: FUNGI AND MYXOMYCETES IN SURREALISM, FANTASY, AND SCIENCE FICTION (PART 2)

Attack of the Xenomorphs

One of the most notorious occasions in which a fungus changed the course of human history occurred in Ireland in the late 1840s. *Phytophthora infestans*, the fungus responsible, parasitized and killed potato plants, causing widespread ruin of the entire Irish potato crop in 1846–47. Over a million people starved to death and another million or more were displaced, while the destructive mechanism of the phytophthora organism (now classified in the oomycota) remained unknown until the 1860s. The British mycologist E. C. Large, who observed in *The Advance of the Fungi* that fungi had long symbolized “pre-existent mortification . . . and miscellaneous principles of evil,” described the action of phytophthora (botrytis) on the potato plant in an unsettling comparison that vividly individualizes the meaning of anatomical invasion of one organism by another:

If a man could imagine his own plight, with growths of some weird and colourless seaweed issuing from his mouth and nostrils, from roots which were destroying

and choking both his digestive system and his lungs, he would then have a very crude and fabulous, but perhaps an instructive, idea of the condition of the potato plant when its leaves were mouldy with *Botrytis infestans* Mont.¹

The metaphor of alien invasion is a classic science fiction (SF) premise, taken up in countless books and movies, from *Invasion of the Body Snatchers* (1956) to *Alien* (1979), and we find that mushrooms and slime molds have long been a lasting source of anxiety and perplexity in the representation of this crucial theme in both image and text. Mushrooms have figured into other classic SF themes—metamorphosis and mutation, nature out of control, space travel and the fantastic voyage, the plurality of worlds—but the displacement of the fungal organism into the menace of invasion from outer space and/or into the human body is a hallmark of our deepest fears and everlasting uncertainties.

Science fiction is a philosophical literature characterized by the interactions between cognition (the rational explanation of imagined worlds) and estrangement (making the familiar strange).² While this generalization is not to deny that there are many types, variations, and qualities in the genre, there is no doubt that SF has

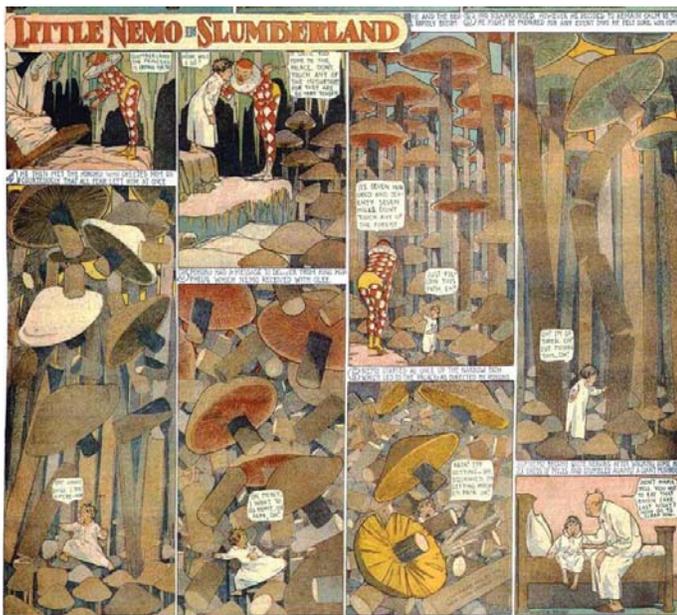
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attempted to interpret scientific knowledge and to question the place of humankind in the universe as the genre has expanded in popularity in the last two centuries. As fungi enter the picture, we will find that SF attempts to answer the question “What are mushrooms?” by exploring the ontological status of the fungi amongst other life forms, to interpolate mushrooms into alien worlds and improbable circumstances, and to defamiliarize them by exaggerating and problematizing their essential characteristics: their subvisible existence, rapid growth and metamorphosis, spore dispersal, absorptive capacities, mycelial expansion, and plasmodial movement (slime molds), as well as their edible, toxic, and hallucinogenic properties. The keys to SF are in making the familiar strange (and vice versa) and in finding the unusual in the usual, just as science itself does, just as Robert Hooke did when he focused his primitive microscope on a bit of mold and first described the alien morphology of mucor in his *Micrographia* in 1665. Whether we train our eyes microscopically toward the subvisible or telescopically toward the heavens, we will find fungi, and even in the folklore of Great Britain shooting stars from outer space turn up as blobs of fetid jelly resembling a species of tremella or a plasmodial slime mold. In fact, we can claim this folklore as a precursor to the science fiction vision and to twenty-first century speculations about astrobiology. In Wales, *pwdre ser* (“starrot” or “star-slime”), has been a name applied for centuries to various fungi, slime molds, and the alga nostoc, perceived by locals as the gelatinous residuum of meteorites fallen to earth. The poets Abraham Crowley, John Donne, Robert Heath, Richard Lovelace, and Sir John Suckling all versified on the connection between falling stars and sordid jellies, and even the modern poet Robert Penn Warren wrote a poem entitled “Have You Ever Eaten Stars (A Note on Mycology).” In Veracruz, Mexico the myxomycete *Fuligo septica* has been called *caca de luna*, showing again that the analogy between the celestial and fungal realms is widespread and pervasive because their natural representatives (comets, mushrooms) are otherworldly, awe-inspiring, fear-provoking, and harbingers of the strange.³

The science fiction adventure tales of the 19th century had their roots in the popularity of Victorian natural history. Jules Verne (1828–1905) fully exploited the enthusiasm for nature study in Victorian science in several stories of “extraordinary voyages” which have lost little of their exuberant appreciation of natural history to this day. In particular, *Journey to the Center of the Earth* (1864) and *20,000 Leagues under the Sea* (1870) are rife with the mania for the classification of genera, species, and types. In the latter story, as Captain Nemo pilots the *Nautilus* through the underwater mysteries of the world’s oceans, the marine flora and fauna are presented as if under a spectacular and magical lens: trunkfish, bioluminescent noctilucae, capacious squid, mushroom-like madrepores, sponges, and polyps all vie for our attention as the *Nautilus* surveys the life aquatic. The fungal world occupies a

vibrant niche in this dream-like environment: “I saw mushroom-shaped fungi, slated-colored sea anemones . . . organ-pipe corals shaped like flutes . . . shells . . . which were spiral-shaped at the base and which lay in hollows in the madreporic formations . . .”⁴ The undersea mushrooms observed from the *Nautilus* are, of course, only coralline analogies to the kingdom fungi. Madrepores are reef-building corals of tropical seas that include the “mushroom corals,” and it is worth noting the many morphological and nomenclatural analogies to terrestrial mushrooms in the submarine phylum cnidaria (anemones, corals, and jellyfish). The two basic structural forms of cnidaria, the polyp and the medusa, are visibly isomorphic with ascomycetous cup fungi and basidiomycetous gilled mushrooms respectively, and common names like “deadman’s fingers” have been applied both to a soft coral and to *Xylaria polymorpha*. The correspondence between madreporic and mushroom operates in Verne and elsewhere through an imaginative conflation of parallel forms from divergent environments, just as Welsh folklore unites the coincidental appearance of meteorite and jelly fungus. One origin of this trans-amalgamation of polypous and fungal life-forms is William Blake’s *Milton*, where the *polypus* is depicted as a colonial organism signifying generation: a vast, primordial body beneath the deep that ultimately covers the whole earth with fibrous vegetation. Is this not like a fungus? Or a reef of madrepores? Or life itself?

Journey to the Center of the Earth is more explicit in its placement of the fungi in center stage, if only for a brief moment, though in this work the governing paradigm is geological. In the story, Otto Lidenbrock, a German natural historian happily obsessed with geological field work in its deepest sense, and his nephew Axel journey to Reykjavik, Iceland, to enter the crater of a volcano and descend into the bowels of the earth. Through many rousing adventures, Professor Lidenbrock leads his party to a central sea bordered by a forest of gigantic mushrooms near the earth’s core. Axel describes the mushrooms as follows: “It may be imagined how big these plants which love heat and moisture had grown. I knew that *Lycopodon* [sic] *giganteum*, according to Bulliard, attains a circumference of eight or nine feet, but here there were white mushrooms thirty or forty feet high, with heads of an equal diameter. There were thousands of them.”⁵ The trappings of Victorian science are apparent in the casual reference to mycologist Pierre Bulliard, but the motif of giant mushrooms has additional significance. For Verne and the Victorians, science preferred to focus on noble objects higher up on the great chain of being, and ambiguous organisms like mushrooms were commonly deemed unworthy of study. Verne captures the emergent appreciation of mushrooms by conferring on them the stature and the nobility of trees. Such gigantism compensates for mushrooms normally being overlooked: one cannot fail to notice and comment on these monsters if they are as tall as oaks. Forests of giant mushrooms turn up in speculative literature and popular culture later on, and



Little Nemo in Slumberland; October 22, 1905.

we find them again in J. M. Barrie's *Peter Pan* (1907), in the cartoon *Little Nemo in Slumberland*, and in John Uri Lloyd's fantastic novel *Etidorhpa* (1895), another "hollow earth" story. In *Etidorhpa* ("Aphrodite" spelled backwards) the ingestion of a "narcotic fungus" is superadded to the intertwining motifs of giant mushrooms and towering basaltic formations in the earth's interior. Terence McKenna speculated that a likely stimulus to Lloyd's bizarre tale might have been *Stropharia cubensis*; after all, John Uri Lloyd was brother to the mycologist Curtis Gates Lloyd and both were heirs to the Lloyd pharmacological fortune in Cincinnati, Ohio.⁶ As for *Little Nemo in Slumberland*, a popular newspaper cartoon by Winsor McCay, the edition of October 22, 1905 features a tale in which our hero, Little Nemo, is drawn into a vast underground chamber by a harlequin attendant of King Morpheus who directs Nemo onto a precarious path through a forest of giant mushrooms. As the boy touches a mushroom, the stipe cracks into columnar segments, toppling the adjacent mushrooms like dominoes, and the whole forest of mushroom pillars comes down crashing like the columns of a Greek temple in an earthquake. Little Nemo awakes—for it was only a Slumberland dream—and one imagines Jules Verne smiling approvingly at this surreal cartoon with its crazy geo-mycological motif from *Journey to the Center of the Earth* and whose eponymous protagonist reminds us of Captain Nemo from *20,000 Leagues under the Sea*.⁷

More than any other writer, Herbert George Wells (1866–1946) was responsible for launching the science fiction of the twentieth century. H. G. Wells, as he is commonly known, wrote the classic tale of alien invasion, *The War of the Worlds* (1898), which was mimicked by Orson Welles in the infamous New York radio broadcast of 1938 that caused a widespread panic and has been most re-

cently rendered into a violent, bombastic movie by Steven Spielberg in 2005. Aliens from outer space, particularly those from the planet Mars, never fail to excite our interest by pandering to human fears that we are not alone in this universe after all. Amateur mycologists periodically rediscover Wells's short story "The Purple Pileus" (1896), which is his most overtly mycological tale and always ripe for re-casting as a fable foretelling the jubilee of psychoactive mushrooms. Coombes, the protagonist, seems a completely ordinary if unfulfilled and henpecked shopkeeper, until, in a suicide attempt, he gorges on the purple mushrooms he finds in a pine woods. Instead of the intended effect, the mushrooms induce euphoria, and then a *petit mal* episode of berserkerism, and Coombes evicts his wife's objectionable friends from his shop in the process of attempting to force-feed them fistfuls of fly agaric. In the end, Coombes is vindicated of his erratic behavior with a renewed self-confidence, a tractable wife, and a successful business. To the life-altering purple pileus Wells ascribes the ability to change human destiny, and *this* constitutes the radical message of the story: that a seemingly inconsequential clump of lowly fungi harbors the power to re-order the future and to change life, if only, in this case, that of an absurd, pathetic fellow as Coombes. "The Purple Pileus" demands to be understood in the context of Wells's many visionary stories and novels and not merely awarded bland appreciation as a single, aberrant curiosity about mushrooms. Wells wrote stories about insects and lichens ("The Moth"), phosphorescence ("Aepyornis Island"), bioterrorism ("The Stolen Bacillus"), squid ("The Sea Raiders"), and poisonous flowers ("The Treasure in the Forest"), among many similar subjects. His sympathy toward nature and prescience about technological change collided head on with his alarm about the human proclivity toward warfare, and he crafted these themes in pioneering novels that deeply influenced the SF visions soon to follow. Wells's novel *The First Men in the Moon* (1901) exceeds by far the honest appreciation of the world of fungi set forth in "The Purple Pileus," and it provided a model for the first cinematic science fiction fantasy, *Le Voyage dans la lune* (*A Journey to the Moon*) by George Méliès, released one year later in 1902.⁸

In *The First Men in the Moon*, the scientist Cavor invents a substance that circumvents the power of gravity, and using this he and his companion Bedford launch themselves moonward in a spherical ship. The world the two explorers find is not the barren, crater-pocked satellite that we now know so well, but a moon-scape alive with vegetation and fungi, though devoid of animals. Bedford describes sheets of livid lichen covering small hillocks; fungoid structures bursting with spores; bulging and distended bladder fungi; and the coralline, striate, and radiate forms of moon-plants that grow faster than puffballs on earth. When they lose their food supply, they try the mushrooms, which like those in "The Purple Pileus" have intoxicating properties. They meet the

Selenites, the intelligent, insect-like inhabitants of the moon's interior, who conduct them into vast underground chambers à la Jules Verne. In sum, Wells delivers us a planet that is a sustained metaphor for fungus: the moon is a place where fungus is an environment, a foodstuff, an intoxicant, a soporific, an integral and symbiotic aspect of the fantastic lunar flora, and a source of phosphorescent light. The insectile Selenites prove to be flimsy as fungus, and they, too, become bioluminescent. The planet itself is sponge-like as if it were a spherical bolete orbiting the earth. All that is unusual and mysterious about mushrooms coalesces in *The First Men in the Moon* into a fantasy selenography that is mycologically rich and extraordinarily strange. Bedford exclaims, "Strange! The very forms and textures of the stones were strange. It was all strange." If in *The War of the Worlds* the invading Martians are alien in part thanks to "something fungoid in the oily brown skin," here on the moon is an utter phantasmagoria of fungus, yet green cheese is nowhere to be found.⁹

George Méliès's cinematic adaptation of the Wells novel in *Le Voyage dans la lune* diminishes the role of mushrooms to a few simple motifs, mainly because films of the time were far shorter and technologically primitive by today's standards and, of course, they were silent. In the Méliès version, a cadre of manic scientist-wizards of the Institute for Incoherent Astronomy plot a moon voyage and fire a projectile manned by several of their wildly gesticulating company from a giant cannon. Once on the moon, they too meet moon-dwellers called Selenites, and one short vignette of this SF classic is captioned, "Inside the moon, the cave of the giant mushrooms." An umbrella appears and transforms surrealistically into a mushroom (a pictorial device derived from Grandville), and a jellyfish is brought into focus to complete the fungal analogy in a familiar cluster of images. In *A Journey to the Moon*, Méliès reduces elements of Wells but recombines them with elements of Verne, thereby setting a path-breaking precedent in the cinema of science fiction fantasy.¹⁰

After Wells, the deluge: SF proliferated (like mushrooms) as it clawed its way (like crabs) toward respectability. Science fiction fantasies like David Lindsay's *A Voyage to Arcturus* (1920) probed the metaphysical incongruities of ambi-sexuality and plant-animals (one character was "Nightspore") on a planet far beyond our galaxy. The British philosopher Olaf Stapledon in *Last and First Men* (1931) and *Starmaker* (1937) superimposed science fiction onto a Darwinian framework in detailed future histories of trans-human and trans-species evolution. In the former, Stapledon depicted Martians with both animal and vegetable aspects, and in *Starmaker* a similar fusion of function was attributed to plant-men, calling to mind the earthly model of myxomycetes. The Czech dramatist Karel Čapek produced the dystopian satire, *War with the Newts* (1936), to show "that cultural development could be shaped through the mediation of another animal species."¹¹ Čapek gave a

thoroughly modern spin to natural history by portraying the achievement of the newts (*Andrias scheuchzeri*) in terms of their *quantity*, by subverting the lessons of taxonomy, and by suggesting that hideous monsters have sexual allure, an idea that Hollywood would soon repeatedly prove. Mycologists, too, had inklings of the imaginative potential of their chosen science: Louis C. C. Krieger's "The Millenium of Systematic Mycology: A Phantasy" (1924) was a slight but telling parody of authority-names in taxonomy: a mycologist dies and goes to heaven to find all the mushrooms labeled, but without authority-names. It turns out that God, the final authority, has labeled them all.¹²

However, it is Hugo Gernsback (1884–1967) who must be credited with a most influential development in 1926: the inauguration of *Amazing Stories*, the first pulp science fiction magazine that spawned many imitators and whose hallmark was lurid stories of action, machismo, and adventure. One of these, from the pulp magazine *Astounding Stories*, was "Parasite Planet" (1935) by Stanley G. Weinbaum, a Louisville chemist known for convincing depictions of the thought and emotions of alien beings. In "Parasite Planet," a search for a Venusian plant *xixtchil*, whose spore pods are sought for human rejuvenation, leads to encounters with "fierce Venusian molds," bulbous fungi called "walking balls," and the "doughpot," a nauseating creature consisting of a "mass of white, dough-like protoplasm, ranging in size from a single cell to perhaps twenty tons of mushy filth . . . in effect, a disembodied, crawling, hungry cancer."¹³ The inchoate formlessness and ineluctably voracious appetite of this protoplasmic juggernaut became the archetype of the science fiction slime mold, but Weinbaum also introduces the metaphor of cancer: amplifying the monstrosity of the thing, giving cancer itself a mycological dimension, and planting the seeds of sheer horror. Not surprisingly, one of Weinbaum's literary compatriots in the pulp SF field was none other than the inimitable Howard Phillips Lovecraft of Providence, Rhode Island.

The oeuvre of horror fiction created almost single-handedly by H. P. Lovecraft (1890–1937) capitalizes strictly on the phenomenology of terror, and fungi are absolutely integral to the horrific visions of his fictional universe. His stories glimmer with spectral fungus-light and supernatural beings whose fungoid character is essential to the feelings of loathing, fear, and convulsive disgust to which they give rise. The world of Lovecraft is cloaked in existential darkness, and his work is single-minded in its primal message: there is an ever-present world of horror just around the corner, populated with maleficent beings ready to haunt, horrify, and destroy. Turn to any Lovecraft story and the operant adjectives are *abnormal*, *decaying*, *eldritch*, *fungous*, *gangrenous*, *hellish*, *leprous*, *mephitic*, *necromantic*, *octopoid*, *pallid*, *rheumy*, *slithering*, *tenebrous*, *wormy* . . . you get the picture. There is no happiness here, and no relief from the monotonous pedantry of preternatural horror.

Lovecraft was a talented writer given over to exacting description, and his “Cthulhu Mythos” obsession spawned a subculture of horror that now finds expression in cinematic gore-fests and the false consciousness that a fascination with rivers of blood and spiritual terrorism inevitably bring. Why are *mushrooms* crucial to this malign vision? In Lovecraft, we find the apotheosis of mycophobia: mushrooms are transposed into supernatural forces representing a total “violation of the order of nature.” If Verne and Wells found a fairly benign place for mushrooms in their otherworldly fantasies, Lovecraft and his acolytes have countered this appreciation with one that claims to represent, via their perverse transcriptions of the hieroglyphs of horror, an absolutely non-human world. What works best to characterize the horrifically (and morphologically) non-human than any organism to which evil and ambiguity already tenaciously cling: fungi, crabs, spiders, octopi, and hybrid creatures?

One foretaste of the role of fungi lurking in the Lovecraftian nightmare may be found in the stories of the Viennese writer Gustav Meyrink (1868–1932), author of *Der Golem* (1915) and literary successor to Hoffmann and the Gothic novel. In Meyrink’s story of mushroom poisoning, “Bal Macabre,” a brotherhood of zombies, the Amanita Club, officiates over the dead, or quasi-dead. In “Doctor Cindarella’s Plants” we are witness to an interspecies agglutination of plants, animals, and mushrooms: plants whose tendrils are swollen with warm blood, the eyeballs of dead horses staring into the void, and fungi that palpitate like human flesh. “I saw bowls of ashen, greasy morsels where mushrooms grew covered in a glossy sheen. These mushrooms, made from bloody flesh, palpitated at the slightest touch.”¹⁴ Anyone who has appreciated the blood-like exudations from, for example, *Hydnellum peckii* knows it requires but slight imagination to make the fantasy-leap to animated flesh. We also find in Lovecraft’s story “The Shunned House” an association of fungi and phosphorescence with the supernatural liquefaction of flesh. Based on his Aunt Lillian Clark’s residence in Providence, the house in question was remarkable for the several inhabitants who had died there: too many deaths to count as pure coincidence. The dilapidated house, animated with evil and subject to unearthly visitations, is symbolized by a malodorous cellar with its abundant fungal growths that are suspected of sapping the vitality from the house’s inhabitants:

It was the dank, humid cellar which somehow exerted the strongest repulsion on us . . . the bad odour of the house was strongest there, and . . . we did not like the white fungous growths which occasionally sprang up in rainy summer weather from the hard earth floor. Those fungi, grotesquely like the vegetation in the yard outside, were truly horrible in their outlines; detestable parodies of toadstools and Indian pipes, whose like we

have never seen in any other situation. They rotted quickly, and at one stage became slightly phosphorescent; so that nocturnal passers-by sometimes spoke of witch-fires glowing behind the broken panes of the foe-tor-spreading windows.¹⁵

Crypt-like cellars and phosphorescent fungi signify death-in-life and life-in-death: novelistic signposts on the road to horror. But for all of his precision with the disgusting details of this classic haunted house, Lovecraft eschews the naturalist’s specificity about the fungi that serve as its ghoulish window-dressing, save for Indian pipe. Lovecraft is no mycologist: it matters little whether the mushrooms are of one species or another, for they serve but a single effect: to heighten the reader’s experience of dread. Fungi lack any positive functionality in the mycophobic charnel-house of Lovecraft’s fiction, and in “The Whisperer in Darkness” he boosts their malign purpose further yet. In this story, the “fungi of Yuggoth” are hideous emissaries of “trans-cosmic horror” from beyond the planet Neptune: bulbous, tentacular, half-fungous, half-crustacean, telepathic creatures that exude a “foetid green ichor” and who transport disembodied human brains in metal cylinders across the solar system, for what purpose it’s only ours to imagine. These trans-fungal myconstrosities are the “Outer Beings,” members of a cosmos-wide race

of which all other life-forms are merely degenerate variants. They are more vegetable than animal . . . and have a somewhat fungoid structure; though the presence of a chlorophyll-like substance and a very singular nutritive system differentiate them altogether from true cormophytic fungi.¹⁶

Here Lovecraft trips up and founders into a slight inconsistency, for there is no such thing as a “cormophytic” fungus (fungi are members of the *Thallophyta*, not *Cormophyta*, in Stephan Endlicher’s 1840 system of the plant kingdom). Though we may be willing to suspend our disbelief over the Yuggoth malarkey, SF does require consistent application of scientific logic within its imagined world. The culminating fiction in H. P. Lovecraft’s eldritch pantheon of mycopathic space polyps is *Fungi from Yuggoth*, a sonnet cycle that spews a nebula of tendentious verse around the abominable Yuggothic mushroom-beings, successfully (one might add, thankfully) obscuring them from view. Perhaps it’s helpful to learn, as a final point of deconstruction, that in his Antarctic tale “At the Mountains of Madness” the fungi-crustaceans are called “Mi-Go” (read “Myco”). Horror enthusiasts will rejoice to find mushrooms aplenty in the stories of Lovecraft’s colleague Clark Ashton Smith (see “The Door to Saturn”) and in Thomas Tryon’s *Harvest Home* (1973) and Brian Lumley’s *Fruiting Bodies and Other Stories* (1993). Quite unlike the magazine *Fungi* you now hold in your hands, the contemporary journal *Fungi: A Magazine of Fantasy and Weird Fic-*

tion, published by Fungoid Press of Lowell, Massachusetts gives a weird, conspiratorial wink to the fungal theme, keeping the Lovecraftian spores swirling about in mephitic clouds to this day.¹⁷

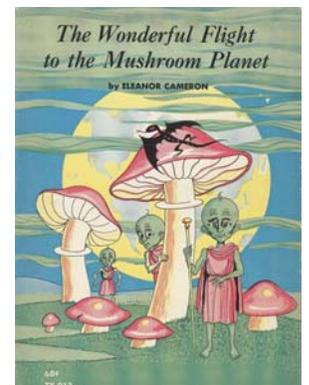
Walt Disney provides fitting escapism from the hellish worldview of Lovecraft, but in *Fantasia* he brings on his own problematic representation of mushrooms. *Fantasia*, released in 1940, is a classic of film animation, and illustrator Arthur Babbitt's creation of anthropomorphic mushrooms in the Nutcracker Suite section of the film has delighted audiences repeatedly. Hop Low, the tiny Chinese mushroom that dances out of step with the rest, was designed to add an element of warmth and humor, but one cannot avoid observing that slant-eyed toadstools, as innocent as they were intended for the cartoon, bear a heavy burden of racism (in yet another transposition of mycophobia), especially when the U.S. was just on the verge of all-out war with Japan.¹⁸

One of the best-known fantasies of the 20th century took shape during the war years by an Oxford professor of Anglo-Saxon: J. R. R. Tolkien's *The Lord of the Rings* (1954–55), in which we find peace-loving hobbits to be particularly fond of dining on mushrooms. Tolkien's colleague C. S. Lewis also found a place for mushrooms in *The Chronicles of Narnia* (1950–56) in the form of "dufflepuds," one-legged dwarves who recall Gordon Wasson's theory of soma and the shade-foot in *Persephone's Quest*.¹⁹ World War II led to the Cold War, and alien invasion depicted in SF films of the 1950s became an increasingly convenient metaphor for expressing collective anxiety about the atomic bomb and war with the Soviets, as many have observed. Mushrooms occupied an underground niche in this anxiety, and even in a novel like Joseph Heller's *Catch-22* (1961), which is *not* science fiction, we find the protagonist Yossarian in a reverie that captures the prevailing mood of American mycophobia at mid-century in the age of Alexander Smith:

Along the ground suddenly, on both sides of the path, he saw dozens of new mushrooms the rain had spawned poking their nodular fingers up through the clammy earth like lifeless stalks of flesh, sprouting in such necrotic profusion everywhere he looked that they seemed to be proliferating right before his eyes. There were thousands of them swarming as far back into the underbrush as he could see, and they appeared to swell in size and multiply in number as he spied them. He hurried away from them with a shiver of eerie alarm and did not slacken his pace until the soil crumbled to dry sand beneath his feet and they had been left behind. He glanced back apprehensively, half expecting to find the limp white things crawling after him in sightless pursuit or snaking up through the treetops in a writhing and ungovernable mutative mass.²⁰

Mushrooms, myxomycetes, and vascular plants have swarmed through countless movies and stories as menacing invaders from beyond the Earth. Biomorphic variants of dinosaurs, insects, and robots reigned supreme as avatars of the strange, especially in film, but fungi and slime molds were never far behind. The film *It Came from Outer Space* (1953) introduced the idea of the "xenomorph" (*xeno* = alien; *morph* = form) to explain intelligent, cyclopic, protoplasmic creatures that crash to earth in a space ship. In the classic SF films of the Cold War era, fungi are quintessentially xenomorphic entities that conveniently fulfill the role of alien invader, in part due to their mysterious genesis and multifarious forms, and in part thanks to political paranoia and media hysteria about UFOs. In fact, one crackpot theory about flying saucers suggested that owls flying at night carrying luminescent rhizomorphs of *Armillaria mellea* were responsible for some UFO sightings. Ray Bradbury, one of SF's enduring authors, wrote the screenplay for *It Came from Outer Space*, and his story "boys! raise giant mushrooms in your cellar!" neatly deployed the alien invader theme via an advertising come-on from some crafty aliens disguised as *Marasmius oreades*.²¹ *It Came from Outer Space* was followed by *Invasion of the Body Snatchers* (invasion by alien pods), *The Day of the Triffids* (perambulating, carnivorous plants with stinging flails), and *The Blob* (a slime mold runs amok); and the British magazine *Authentic Science Fiction* showcased Lee Stanton's *Mushroom Men from Mars* (1951) in its first issue. Eleanor Cameron's "Mushroom Planet" books explored the themes of interplanetary travel and mushrooms in a series of five children's stories: *The Wonderful Flight to the Mushroom Planet* (1954), *Stowaway to the Mushroom Planet* (1956), *Mr. Bass's Planetoid* (1958), *A Mystery for Mr. Bass* (1960), and *Time and Mr. Bass* (1968). In Cameron's books, two boys be-

friend one Mr. Tyco M. Bass of 5 Thallo Street, Pacific Grove, California, who proves to be an avuncular refugee from Basidium, an inferior moon in orbit 36,000 miles from Earth. Basidium is home to the "Mushroom People," a.k.a. Mycetians, and it can only be viewed through Mr. Bass's special telescope, the one with the marvelous stroboscopic polarizing filter. The Mushroom Planet stories had great potential of reaching a young audience with worthy lessons about basidiomycetes and mycology in general, but they fell far short of anything more sophisticated than "golly, gee!" space adventures with simplistic references to mushrooms, spores, phosphorescence, and rocketry.²²



Cover of the first Mushroom Planet book, 1954.

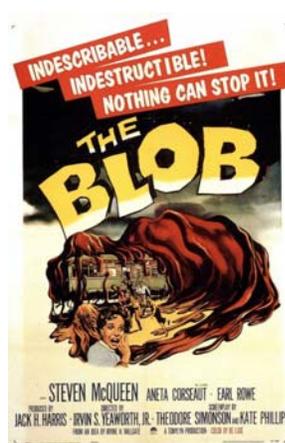
Just as the new wave of British SF, the television series *Star Trek*, and Stanley Kubrick's epic *2001: A Space Odyssey* colluded to pro-

pel SF into a new era, the sexual revolution of the 1960s engendered several novels that situated women in scientific research roles. In John Wyndham's *Trouble with Lichen* (1960), Diana Brackley is a biochemist that develops an anti-aging drug, antigerone, from a rare lichen. *Omnivore* (1968) by Piers Anthony explored the relationships among vegetarians, carnivores, and omnivores among three scientists sent to investigate the planet Nacre, whose environment is dominated by mushrooms and spore-bearing, cyclopic animals called mantas. From reflections that saprobic fungi literally produce life from death, *Omnivore* waxes into a philosophical paean to "the third kingdom" and the role of the fungi as recyclers in nature. Even though mushrooms, the female scientist, and omnivorism are curiously equated, the author discards the alien invader model entirely and attempts an holistic appreciation of fungi and myxomycetes in their evolutionary and ecological roles. Brian Aldiss gives the ecological dimension an apocalyptic turn in *Hothouse* (1962), a fantasy of the far future. The "hothouse" is planet Earth itself, where, in a lush, green jungle environment under a dying sun a brain-like morel with telepathic intelligence guides a human odyssey to discover the truth of evolutionary destiny in a riot of naïve, organic imagery. As in *Hothouse*, propagation and germination are the primary metaphors in John Boyd's *Pollinators of Eden* (1969). The culmination of Boyd's novel is sexual contact between sentient orchids and a female scientist diagnosed with "nyphomaniac omniphilia" dispatched to the planet Flora to research plant communication.²³ The interspecies sexual dialectic reaches its mycological climax in *The Fungus* (1989) by Harry Adam Knight, wherein a venereal mold becomes a predatory colonizer of the female body in an explicit lesbian scenario. *The Fungus* is based on the premise that a synthetic virus has accelerated the mutative growth and destructiveness of all fungi. London has been colonized by giant, invasive mushrooms, and millions of people have been obliterated like ants consumed by cordyceps. In a vain effort to characterize this havoc with a modicum of mycological savvy, the author spotlights many types of fungi; dry rot, agarics, yeasts, stinkhorns, tinea, cyathus, sphaerobolus, and *Arthrobotrys oligospora* are but a few that run amok. The result is a cheesy mashup of Salvador Dali with textbook mycology where renegade molds ooze like frothy cascades of borscht and puffballs are the size of radar domes. This puerile, misogynistic, nauseating broth of a novel is a paragon of execrable writing: all the women have firm breasts, all the men want to blow things up, and all the mushrooms are parasitic murderers. The mycology is inexcusably bad, e.g.: "The hymenium is the substance [sic] from which the basidium [sic] grow—the basidium being the micro-organisms [sic] that form the mushroom spores." *The Fungus* is tasteless hackwork, strictly for laughs and groans, e.g.: "The fungus is literally a part of me now. If I broke these fruiting bodies off I suspect I would die."²⁴ Keep in mind that none of the fore-mentioned fantasies were written by women; it wanted Ursula LeGuin, Joanna Russ, and

James Tiptree, Jr., to reclaim women and the female body from male-dominated SF and its fixation on strange ways of getting pregnant, but mushrooms were not on the feminist agenda.

In 1958, a slime mold crept into the American consciousness by way of a movie called *The Blob*. A camp SF classic of its kind, *The Blob* starred Steve McQueen and featured a snappy title song by Burt Bacharach that gained some airplay on AM radio. In *The Blob* a meteor crashes to Earth and releases a luminous spheroid of quivering protoplasm that attaches itself to human flesh, absorbing and liquefying it. The jelly-like blob grows to monstrous proportions, threatening to engulf an entire town; along the way, it induces mass hysteria until a cohort of screaming teenagers discovers the simple trick that stops it—water. Some have noted that the pulsating blob resembles a myxomycete, but is this a plausible depiction of a slime mold, given the fantastic parameters of the movie? SF has squeezed a lot of juice out of myxomycetes, and it will be useful to consider the common sources of fascination with these protean organisms: first, the plasmodium; second, plasmodial streaming; third, absorptive nutrition; fourth, metamorphosis from an animal-like to a fungal state; fifth, the duality of its animal-vegetable nature. In *The Blob* we are presented with little more than a plasmodium that absorbs and destroys; there are no suggestions of metamorphosis (other than growth) or duality of form. Neither is there a particular attempt to depict plasmodial streaming, which in some myxomycetes manifests back-and-forth wave-like movements; in *The Blob* there is simply the relentless forward motion of a blobular entity that is voraciously aggressive. The subconscious model may be plasmodium (myxomycete) or protoplasm (basic living matter)—we cannot tell. In fact, the original concept of the film was based on the Sherwin-Williams Paint Company slogan "cover the earth," and the original titles were "The Molten Meteor" and "The Glob That Girdled the Globe." The actual "blob" used in filming the movie was a silicone-covered balloon. Whether the producers were cognizant of slime molds is not certain, but they tapped into a primal fear about being absorbed by viscous, living matter that merits further analysis as a science fiction theme.²⁵

One cinematic precursor to *The Blob* was *It Came from Outer Space*, mentioned above, in which human victims are enveloped by nebulous, blob-like aliens from beyond, "xenomorphs" that combine the characteristics of myxomycete, jellyfish, and Cyclops. *The Thing*



Movie poster for *The Blob*, 1958.

from *AnotherWorld* (1951) explored the idea of duality of form but omitted slime molds in favor of a hyper-aggressive humanoid that behaved much like Frankenstein on steroids. The British film *The Quatermass Xperiment* (1956), a.k.a. *The Creeping Unknown*, brought forth the blob's first cousin: a protoplasmic slime that arrives on Earth from an aborted space mission, assimilating human flesh on contact, leaving a slime trail like the cellular slime mold *Dictyostelium discoideum*, and ultimately morphing into an octopoid monster. This noirish film effectively combines more characteristics of slime molds than did *The Blob*.²⁶ The animal/vegetable duality of form theme has thrived in SF from H. G. Wells's *War of the Worlds* to Stanislaw Lem's hybrid world of breathing lung-trees and plant-spiders in *Eden* (1989). More complex yet is the "ecologarium" of Samuel R. Delany's short story "The Star Pit" (1967). The ecologarium is an environmental laboratory of living creatures like an ant farm writ large, yet behaving as a single creature suspended in a protoplasm. In *Memoirs of a Space Traveler* (1971) Lem concocted a similar model environment, a composite fungoid as a liquid medium with cybernetic feedback functions, distinctly like a slime mold, a vision of fluidity of form in a unified matrix. Lem's plucky space traveler, Ijon Tichy, described the manufactured fungoid as follows:

Behind the thick round glass spread a viscous structure consisting of thick stalks and gossamer bridges and festoons. The whole mass, completely motionless, remained mysteriously suspended: to judge from the consistency of that pulp or ooze, it should have sunk to the bottom of the tank. . . . Suddenly I noticed a slight movement. One gray-brown tentacle covered with pustular swellings rose and glided, through the loops of others, in my direction. With peristaltic spasms, as of slimy, repulsive intestines, it came up to the glass, pressed against it opposite my face, and made several feeble crawling motions before becoming still. I had the eerie feeling that this jelly was looking at me. . . . With growing bewilderment I stared at the fungous ooze, absolutely certain that what faced me was not just a living substance but a real being. Why, I cannot say.²⁷

In essence, SF counterparts to myxomycetes are projected anxieties about viscous matter. Fantasy slime molds tend to develop accretions of tentacular entities (crabs, octopi, cancer) and to recapitulate the uncanny parallelism of celestial and fungal realms. The repulsion to the viscous seems always to give way to other fears, as in William S. Burroughs *Naked Lunch* (1959) where "undifferentiated tissue" always metastasizes into cancer or worse: "his flesh turns to viscid, transparent jelly that drifts away in green mist, unveiling a monstrous black centipede."²⁸ SF turns away from myxomycete biology, fine structure, and behavior (except for absorptive nutrition) to focus on slime *at the level of ap-*

pearance. Jean-Paul Sartre, in his existentialist classic *Being and Nothingness* (1943), tells us why: the slimy (*visqueux*) provokes disgust because it is solid matter imitating liquidity; its fluidity is contradictory because it moves in slow motion; and we find intolerable the ambiguity of a living substance in between two states.²⁹ Plasmodial slime molds are liquids metamorphosing into tactile nightmares, seeming to externalize and mimic body fluids, vomit, and viscera. SF slime molds have proliferated in pop culture: in schoolgirl romances like Judith Enderle's *Adrienne and the Blob* (1986); in film, *The Stuff* (1985) and a remake of *The Blob* (1988); and there was a celebrated incident in 1973 in which the Texas national guard was put on alert to battle a blob of *Physarum cinereum* in response to a citizen's needless alarm.³⁰ One of the most charismatic slime molds in SF appears in Philip K. Dick's novel *Clans of the Alphane Moon* (1964), in which a Ganymedeian slime mold aptly named Lord Running Clam is a telepathic mentor in a lunar society of psychopaths. Yet even here the biology of myxomycetes is bypassed in favor of special effects; Dick might have designated his Lord Running Clam a chytrid, an orchid, or a squirrel and accomplished much the same results.³¹

Philip K. Dick (1928–1982) has risen to a pivotal position in SF, and the integral role of psychedelic mushrooms in science fiction fantasy finds its most bizarre expression in his work. The postmodern darling of SF, Dick has recently been canonized by his inclusion in the Library of America, and there are at least eight major film adaptations of his stories, including Richard Linklater's rotoscope version of *A Scanner Darkly* (2006), one of the purest and most effective SF films ever made. Surely Dick had been exposed to amateur mycology during his lifetime in California: in *The Man in the High Castle* (1962) he describes a woman who wore such *meshuggah* clothing that she looked "like a woman who played tennis or (even worse) collected mushrooms in the woods."³² In *Dr. Bloodmoney* (1965) the West Marin school board questions an incoming teacher on his knowledge of edible and poisonous mushrooms, and some are impressed that he is equally authoritative about amanitas and psychoanalysis. Amidst repeated focus on psychopathology, drugs, virtual reality, precognition, and political megalomania, Dick's novels and stories are peppered with fungi and lichens. In particular, *The Three Stigmata of Palmer Eldritch* (1964) and *The Transmigration of Timothy Archer* (1982) take us careening through interior worlds revealed by hallucinogenic fungi. In the former, the drug tycoon Palmer Eldritch promises to deliver eternal life to the users of Chew-Z, a lichen-derived hallucinogen that rivals Can-D, the staple drug of the solar system. Chew-Z tastes like "decayed mushroom" and transforms its user into a phantasm transcending time, space, and metabolism. Eldritch boasts, "With Chew-Z one can pass from life to life, be a bug, a physics teacher, a hawk, a protozoon, a slime mould, a street-walker in Paris in 1904," and he diabolically promotes a merchan-

dizing war between Chew-Z and Can-D factions that can scarcely be differentiated from the rival versions of the alternate realities induced by the respective drugs.³³ *The Transmigration of Timothy Archer* seems less like SF and more a pseudo-scholarly rehash of Gnostic studies. Here, a skeptical reading of Christianity's origins in light of the Dead Sea scrolls leads inevitably to a fascination with the ancient Zadokite rite of consuming psychoactive mushrooms, posited as precursor to the Christian sacrament of the Eucharist. The Zadokite mushroom under discussion is (no surprise, really) *Amanita muscaria*, called *anokhi*. In the story, Dick reverently invokes John M. Allegro, author of *The Sacred Mushroom and the Cross* (and once called "the Liberace of Biblical studies"), and the upshot of the book's shopworn speculation is that the identity of Christ, kept secret for two millennia, is actually *anokhi*, grown in caves, baked into bread, brewed in broth: the hallucinogenic root source of the Christian doctrine of the trans-substantiation of bread and wine.³⁴

Ideas about the mycological derivations of religious experience—spawned by Wasson, cultured by Allegro, and brokered wholesale by McKenna—have had literary manifestations that continue to percolate through mainstream fantasy and pop SF alike. Aldous Huxley's *Brave New World* (1932) with its ration of *soma* became, in his *Island* (1961), the mushroom *moksha*-medicine that captured the laidback, psychedelic zeitgeist of the 1960s. The sham anthropological fantasies of Carlos Castaneda warrant passing mention, for they undoubtedly influenced films like Ken Russell's lurid *Altered States* (1980). The revelation that some mushrooms provoke visionary experience was a potent stimulus to SF, and while the pharmacology and phenomenology of the experience should by now be well-understood, the experience itself is fundamentally transformative in a way that SF would claim as the xenomorphic appropriation of mind and reality. Dick's *Palmer Eldritch* is but one pathway to the literature of altered reality that has emerged as a hybrid of the classic drug narrative. It is hardly contradictory, then, to consider Terence McKenna's oeuvre of psilocybe proselytizing as a form of rhetorical posturing proximate to science fiction

rather than dismissing it as junk science or the raving of a fanatic. After all, McKenna was wont to consider virtual reality, UFOs, evolution, and shamanism as constituent tremors of a cosmic orgasm in which psilocybin and its sister chemicals are the key triggers. In his preposterous claim that "the mushroom religion is actually the generic religion of human beings and that all later adumbrations of religion stem from the cult of ritual ingestion of mushrooms to induce ecstasy" he unmasks himself as an accomplice of mystification, and his equally ridiculous claim that mushrooms are a visitation from otherworldly sources fixes his writing in the same camp as Immanuel Velikovsky's *Worlds in Collision*.³⁵ Unless, of course, we label it SF. Terence McKenna, the arch mystagogue and Svengali of mycology, is Palmer Eldritch, and his mesmeric exhortations on liberty caps serve only to inscribe SF fantasy onto his missionary utterances from the perspective of psychedelic experience, an experience equally capable of conjuring angels . . . or devils.

In contrast to McKenna's chronic distortion of fact, perhaps the finest realization of the apocalyptic mushroom in SF appears in a single cartoon by the French film animator Jean Girard, whose *nom de plume* "Moebius" reminds us of a topological conundrum: the moebius strip. In his cartoon *World Killer* (1988) Moebius rescues the divine mushroom from McKenna's hucksterism in a simple, eschatological story of breathtaking vision. The mushroom episode of the story is also known as "A Real Wonder of the Universe" ("*Ein wirkliches Wunder des Universums*"); it begins as the space traveler Fildegar explores the barren landscape of an unnamed planet light-years from Earth. A strange force pulls him through mountainous crevices until he reaches a single, giant *Amanita muscaria* mushroom towering before a distant escarpment. The *Fliegenpilz* (fly agaric) greets him: "I am Kurbalaganta and I've been waiting for you since the beginning of time." Fildegar is wonderstruck. The *Fliegenpilz* continues, "You believe you know everything, but there's something that you don't know. Do you know . . . that you are here to destroy me and the rest of the planet as well?" Fildegar protests that he would not harm a fly, but



"I am Kurbalaganta and I've been waiting for you since the beginning of time."



"I know that you hate me there on Earth . . . you will do anything to make me extinct."

the mushroom accuses him of seeking its extinction. Again, Fildegar is overcome by a strange, psychic force that tempts him to break off a piece of the giant *amanita*'s sturdy volva. He tastes and finds it delicious; the mushroom intones, "My empire stretches to the most distant galaxies; unfortunately mankind's hate has followed me throughout the universe and defeated me." At this juncture Fildegar panics and races toward his spacecraft and its "*Kristall*" power source, but a titanic rush of cosmic energy envelopes him within and without, and he

is blasted to atoms as his home planet Bar-Jona explodes in a super nova. So ends the reign of the “holy mushroom” and presumably all of humanity. Like *Alice in Wonderland* warped beyond all recognition, *World Killer* delivers a portentous message about the ultimate meaning of psychoactive mushrooms. This berserk cartoon may well be the most succinctly symbolic and cautionary SF story about mushrooms ever written.³⁶

Hallucination, invasion, revulsion, and fear—does SF offer us fungi in any other guise than as displaced angst? Can it teach us anything substantial about mycology as a science? One place these questions take us is to the planet Mars, the locus of an enduring fascination with an alien world, from Giovanni Schiaparelli’s discovery of Martian “canals” in 1877 to the recent photographic reconnaissance of the planet’s surface by NASA’s Mars Exploration Rovers in 2004. Scientific speculation about the possibility of microbial and fungal life on Mars continues to this day, fueled periodically by discoveries like the meteorite ALH 84001 in Antarctica in 1984. The romance with Mars has deep roots in SF, and recent novels have focused on the likelihood of discovering, or establishing, life on the red planet. A common thread in these novels is the expectation that lichens, a symbiotic combination of a fungus with an alga, are to be found on Mars since they are known to survive on Earth in a variety of extreme environments. Kim Stanley Robinson’s *Red Mars* (1992), *Green Mars* (1993), and *Blue Mars* (1996) form an epic trilogy about the exploration and “terraforming” of Mars in which lichens play a key role. Ben Bova’s *Mars* (1992) is a saga in which a thallophyte similar to terrestrial lichens is discovered in the Martian regolith, prompting speculation about ecological relationships that might imply the existence of other life forms. Another expedition story in the “hard SF” genre is Geoffrey A. Landis’s *Mars Crossing* (2000), which presents us with a spacecraft bound for Mars that is troubled by a rampant parasitical fungus. Its behavior, however, is unlike any known organism as it progressively parasitizes human skin and respiratory tract, clothing, air filters, and electronic circuit boards. Since most fungi are chauvinistically substrate-specific, it seems unlikely that a species of tinea would end up also ruining electronic fuel controllers, proving that even when authors take pains to inject a measure of realism in depicting how fungi and lichens behave, the dramatic appeal of catastrophe tends to deflect the science away from the fiction.³⁷ The concern for terrestrial ecology has driven the plots of many SF novels, as in J. G. Ballard’s *The Drowned World* (1962), which offers a startling depiction of colossal gymnosperms thriving in fungus-choked lagoons of inundated European cities. Bernard Werber’s *Empire of the Ants* (1991) propels us into yet another kind of world: a pine stump where a civilization of ants of the kingdom Bel-O-Kan cultivates agaric mushrooms in vast agricultural beds and whose minions are fatally susceptible to the spores of the parasitic alternaria. Here again, mycological exacti-

tude claims second place to psychological verisimilitude in imagining the mental and social world of ants. In any case, what unites these disparate novels are convincing scenarios of possible worlds via imaginative extensions of the parameters of science. Even John Updike, not usually known for SF, has written lyrically and accurately about fungal biology in his novel of the future, *Toward the End of Time* (1997). But who will write the SF story that employs, with mycological precision, a convincing depiction of conidiogenesis or that builds a fantasy around the alternation of teleomorph and anamorph?³⁸

If exobiology (a.k.a. astrobiology) has some basis, albeit speculative, in the present reality of interplanetary exploration, perhaps *exomycology* will one day prove to be a legitimate interdisciplinary subfield of mycology. Until then, SF is our single vantage of exomycological speculation. However, what we might indeed posit as exomycology is at least one century old: in 1908, the Swedish chemist Svante Arrhenius, in his book *Worlds in the Making*, proposed the theory of “panspermia,” that migratory spores have traveled through interstellar space to arrive on Earth. This is surely grist for the SF mill: D. G. Compton in *The Silent Multitude* (1965) constructed an entire novel around the theme of alien spores, and a remake of *Invasion of the Body Snatchers* in 1978 attributed its notorious pod-invaders explicitly to panspermia, that spores have drifted to earth as intergalactic dust from worlds beyond. In essence, panspermia, whose feeble claim to scientific credibility implicitly counters Darwinian evolution, returns us directly to the alien invasion metaphor that suffuses so much of SF, inevitably enlisting fungi in every conceivable xenomorphic permutation. In Richard Matheson’s story “The Creeping Terror” (1961) the city of Los Angeles is an “asphalt and citrus megafungus;” in Elizabeth Hand’s *The Glimmering* (1997), a fungus that cures AIDS, *Fusarium aperiix sporotrichellia*, or FUSAX 687, ends up colonizing the human body, and in her *Icarus Descending* (1993) mushrooms like “*Amanita cerebrimus*” are cultivated on human corpses; in William Gibson’s cyberpunk classic, *Neuromancer* (1984), mycotoxins that interrupt brain-computer interfaces prevent entry into cyberspace; and a book devoted to the technological perplexities of the computer age is entitled *The Devouring Fungus*, though the rival, viral metaphor now predominates, à la Michael Crichton’s *The Andromeda Strain*.³⁹ Popular reaction to the science news of 1992 that single mycelial growths of armillaria in Michigan and Oregon extend hundreds of hectares underground found its shabby SF analogue in the grotesque sensationalism of a *National Enquirer* headline: “Monster Fungus Eating the U.S.” An episode entitled “Field Trip” (1999) of the TV series *The X Files* conflates the armillaria discovery with alien abductors in a grisly story of invasive, hallucinogenic mushrooms that engulf their victims in myxomycetous goo, a fate that special agents Mulder and Scully narrowly escape.⁴⁰ The video game *Spore*, whose players

design and shape microbial, social, and galactic evolution, begins as a panspermian comet collides with its substrate planet. The consistent message in all of these representations is singular and unmistakable in its reductive fixation: *fungi and their spores are alien invaders*. A culminating moment in this ineradicable view of fungi as invasive menace is the masterpiece of Japanese cinema, *Matango: Attack of the Mushroom People* (1963), directed by Inoshiro Honda (1911–1993) who unleashed countless *kaiju* movies like *Godzilla* and *Mothra* onto the big screen, creating a lasting mythos surrounding world-destroying monsters.

Also known as *Fungus of Terror*, *Matango* was based on a 1907 story “Voice of the Night,” by William Hope Hodgkin, and it employed then cutting-edge technology of Japan’s famous Toho Studio. The movie’s premise is simple: a pleasure-craft blown off course in a storm finds refuge on a desert island off the coast of Japan. In search of food, the yacht’s company of five men and two women discover a fog-shrouded, derelict ship whose interior is polluted with dry rot and mold. As rivalry and animosity fracture the group, their situation deteriorates, and they succumb, one by one, to eating, and being consumed in turn by, the colorful mushrooms proliferating in a far pocket of the island’s jungle environment. On the brink of seduction (or shall we say, “*mycomorphosis*”) by the sexy female crew-member, the leader of the group is mysteriously rescued, and the movie’s conclusion appears at the beginning in a Tokyo flashback where the sole survivor laments: “I don’t know who saved me. But I regret it now. If I really loved her, I should have eaten, too, and become a mushroom—and lived with her there.”⁴¹ The DVD release of *Matango* is an excellent instance in which the commentaries are as entertaining as the movie, and an interview with producer Teruyoshi Nakano provides fascinating details about the production. The *Godzilla* model maker Teizo Toshimitsu created the mushroom models for *Matango* out of rice pastry (*mochi*) purchased at Seijyo Fugetsu-do, a venerable pastry shop founded in 1918, and the intention was to show the process of people turning into mushrooms after eating them. The movie trailer blatantly advertised “radiation has created a bloodsucking evil,” and this is the real key to the film, that the mushrooms constituted evidence of radiation and mutation, the sub-text of many Japanese *kaiju* in the wake of Hiroshima and Nagasaki. Though Japan is a mycophilic culture, Nakano reminisced that many Japanese children who saw *Matango* at the time of its release could not stomach eating mushrooms for many years afterwards. The inter-transformability of



Movie poster for *Matango: Attack of the Mushroom People*, 1963.

mushrooms and humans as a secondary result of nuclear disaster is the unthinkable equation that sets *Matango* apart from the typical alien invasion story. By contrast, the recent works of Jeff VanderMeer—*City of Saints and Madmen* (2002) and *Shriek: An Afterword* (2006)—though saturated with mushrooms, are unconvincing in their self-referential, hyper-literary, and overly stylish appropriation of mycology in the service of fantasy. VanderMeer’s “grey caps” or “mushroom dwellers” are literally an underground contingent of humanoids who, in the spirit of *Matango*, are “both child and mushroom,” and are given an offstage purpose that imbues both novels with an atmosphere giddy with mystery. What is more, the linkage of mushrooms with the tentacular is revisited in the form of VanderMeer’s concurrent fascination with squid. Yet his attention to mushrooms themselves remains limited to little more sophisticated than their colors, shapes, and tastes; and with such erroneously attributed characteristics like pseudopods, cilia, and spores that break off in clumps “like dandelion tufts,” one hopes that for his novel *Finch* (forthcoming, November 2009) VanderMeer will have had the experience of an introductory lesson in mycology. *Matango*’s mushrooms, though they were made of rice cakes, tasted like the real thing.⁴²

Matango haunts us because, in spite of its superficial silliness to Westerners, it alludes to the ever-smoldering remains of Hiroshima. Easy it is to see mushrooms as mutant forms when the experience of death and radiation sickness was the horrific reality for countless Japanese in the aftermath of the atomic bombings that ended World War II. In this cinematic fantasy of the interchangeability of fungi and humans, we have reached a moment of irony where mycophilia has been perversely transposed into mycophobia. Perhaps *Matango* alludes to something in the psyche deeper still, the image of the mushroom cloud that has come to symbolize atomic destruction. Marshall McLuhan, for one, has commented on the symbolic equivalence of the mushroom cloud and the magic mushroom, and it comes as no shock to know that Thomas Pynchon favored *Amanita muscaria* above all others in *Gravity’s Rainbow*. The mushroom cloud *is a mushroom* at the level of the image; true, it is an image of obliteration, but it is also the visual archetype of a form (stipe and pileus). One evidence for this is the eye-witness account of the mushroom cloud that formed immediately after the atomic bombing of Nagasaki on August 9, 1945, written by William L. Laurence, a flight member aboard the B-29 *Bock’s Car*, and reported in the *New York Times* on September 9:

Then, just when it appeared as though the thing has settled down into a state of permanence, there came shooting out of the top a giant mushroom that increased the height of the pillar to a total of 45,000 feet. The mushroom top was even more alive than the pillar, seething and boiling in a white fury of creamy foam, sizzling

upward and then descending earthward, a thousand Old Faithful geysers rolled into one. . . . It kept struggling in an elemental fury, like a creature in the act of breaking the bonds that held it down. In a few seconds it had freed itself from its gigantic stem and floated upward with tremendous speed, its momentum carrying into the stratosphere to a height of about 60,000 feet. . . . But no sooner did this happen when another mushroom, smaller in size than the first one, began emerging out of the pillar. It was as though the decapitated monster was growing a new head. . . . As the first mushroom floated off into the blue it changed its shape into a flowerlike form, its giant petal curving downward, creamy white outside, rose-colored inside. It still retained that shape when we last gazed at it from a distance of about 200 miles.⁴³

The primordial image of the mushroom cloud haunts science fiction as it haunts all of humanity. *Matango's* English subtitle—"Attack of the Mushroom People"—thus strongly hints at fears far deeper than mycophobia. In the song "30 Seconds over Tokyo" the rock band Pere Ubu recapitulates this idea in searing lyrics of existential angst that attempt to measure the emotional distance between killer and the killed, reverberating in a stunning aerial, and mycological, image: "Toy city streets crawling through my sights / Sprouting clumps of mushrooms like a world surreal."⁴⁴

Parallel Mycology

Ralph Waldo Emerson proposed that one become an all-seeing, disembodied, transparent eyeball in order to see the whole of nature. In the present context this should not seem at all a peculiar notion, but Emerson was ridiculed for the idea by some of those he believed capable of only "superficial seeing."⁴⁵ Had he set his eyeballs on retractable stalks and positioned them on the pileus of a talking mushroom, he would have entered the world of H. G. Wells & Company. But the realization for which he was striving with this image conveys the essential idea that nature *informs* the mind, that nature is a vehicle of thought. The literary forms of science fiction and surrealism, in all their permutations, variations, inconsistencies, and even trivialities, have done just this: they have tended to portray the fungi and other life forms in terms of imaginative fantasy and wonder rather than as empirical objects of study (the worldview of science). To expand our understanding and appreciation of mushrooms, we too must embrace imaginative fantasy to seek new ways of thinking about mushrooms, new ways of seeing them, of re-envisioning them. The imagination, embodied in science fiction, poetry, and other forms of artistic endeavor, but above all else embodied in science itself, affords us the pathway. Imaginative wonder is enriched by close observation of nature and the study of history in the same proportion as it is diminished by the tyranny of the visual, the proliferation of visual images that multiply like kipple at the expense of

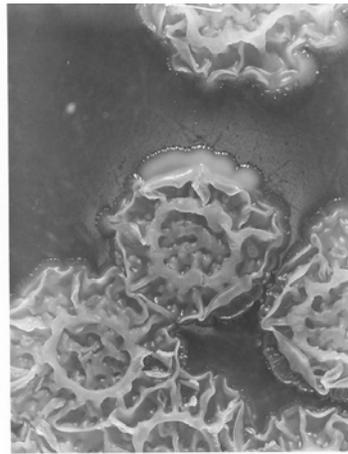
the understanding, thanks primarily to digital media that accelerate all data into the vortex of instantaneous disposability.⁴⁶

Science fiction has attempted to answer the question, *What are fungi?* This is tantamount to asking the question, *What is life?* The simple, formulaic answer of science is that fungi are eukaryotic, heterotrophic, spore-bearing organisms with chitinized cell walls. By contrast, surrealism and science fiction posit the fungi as the cosmos of the strange. From this perspective, to call a particular mushroom "strange" is essentially meaningless since it is the very genius of mushrooms (among other oddball organisms) to embody the strange. Speculative literature has tended to defamiliarize the fungi only to return them to the world depleted of empirical reality but supercharged with a freshness of appreciation. SF attempts to subvert the objectified and commonplace experience of mushrooms as herbarium specimens, groceries, and merchandize. SF has implicitly recognized the spirit of negation that for centuries has tempted so many to belittle the fungi, but has rematerialized this scorn for them by glorifying their odious characteristics and multifarious forms, and thereby legitimizing the imagination. The history of SF thus forms part of a history of mycophobic reaction coupled to an imperative to explain mushrooms from perspectives tangential to science, recognizing as it does their existence in subvisible or parallel worlds portrayed in so many instances as alternate realities. Of course, science itself has infused SF with means to this imaginative end in countless ways; an obvious example is the microscopic reconnaissance of organisms invisible to the naked eye. SF believes that science is too important to be left in the hands of scientists, lest we accept the cataclysmic and fatal mistake, as J. Robert Oppenheimer did, of valorizing the technology of mass destruction as "technically sweet." Guy Davenport observed in *The Geography of the Imagination* that "scientific writing as imaginative writing has been zoned off by literature,"⁴⁷ and C. P. Snow's problematic of "two cultures" (science vs. the humanities) rises up again like a baffled Frankenstein battering down the door of the mycology lab. Why did William Butler Yeats call science "the opium of the suburbs?" Will the physicist and biologist always sneer in smug superiority at Shelley's truth that poetry "is that which comprehends all science, and that to which all science must be referred?"⁴⁸ Science and science fiction, mycology and surrealism, are in truth the deuteromycetes of imagination whose anamorphic and teleomorphic stages are paired and comprehended only when we dare to envision "the whole fungus" in the mind's eye.

In 1977, Leo Lionni published *Parallel Botany* (*La botanica parallela*) a scientific treatise which introduced to the botanical community several families, genera, and species of plants hitherto unknown and undescribed. These included *Giraluna gigas*, *Tirillus oniricus*, and a truffle-like fungus, *Protorbis foetida*, first reported in 1974 in *The Journal of Parallel Botany*. Prior to this publication, Lionni had been known primarily as a graphic artist and

children’s author whose stories included “Theodore and the Talking Mushroom.” The single common characteristic of the plants described in *Parallel Botany* is that they are imaginary. The quality of being imaginary may provoke doubt on the scientific veracity of his report on this disquieting flora, but Lionni correctly explained that only their “matterlessness” distinguishes parallel plants from “the supposedly real plants of normal botany,” admitting that his findings were “bound to upset the illusory consistency of our previous notions of reality and unreality.” Parallel plants have “lost their real existentiality at some fairly remote point in real time,” he stated, but since “verbal discourse is one of their preexistent conditions” it is important to recognize that prior to being plants, “they are words.”⁴⁹ Other than protorbis, Lionni declined to account for the limitless numbers of parallel mushrooms (like logofungus, myxodonta, and mycoprocta) that he might have treated, but implicit in his singular revelation of the paramaterial vegetable world are indeed the spores of Parallel Mycology. Goethe’s *urpflanze* is surely the earliest precursor to the theory of Parallel Botany; a congruent ideality in the history of Parallel Mycology may well be *Agaricus periculosa*, “the dangerous mushroom,” a trans-generic fungus (toxic and/or edible) known for its wildly unpredictable manifestations. It was Linnaeus, so glorified and yet so disparaged, who adumbrated the role of Parallel Mycology in cosmogonic theory, for his *Chaos chaos* was a spore-bearing organism that, in its very name, recalled the cryptogamic essence of undifferentiated primordium from the beginning of time, so reminiscent of the Kurbalaganta of Moebius. According to recent cosmological findings from the field of astrophysics, the entire universe expands by budding, in the manner of single-celled yeasts. Parallel Mycologists, drink deeply from this strange brew: the cosmos itself behaves and reproduces like *saccharomyces*!⁵⁰

The obsessed scrutinists who endorse only realism, materialism, and empiricism will inevitably fail to make sense of Parallel Mycology and its oneiric landscape swarming with the subvisibilia of crepuscular fungal wraiths. Some mycologists, however, have peeped through its window or even ventured a step through its doorway. R. Gordon Wasson and William A. Murrill realized imperfectly that the mycological enterprise has a lyrical component, but Wasson’s writing suffered miserably from the load of his own rhetoric and Murrill’s from a poverty of literary conception. E. C. Large, former president of the British Mycological Society, authored three SF fantasies—*Asleep in the Afternoon* (1937), *Sugar in the Air* (1938), and *Dawn in Andromeda* (1956)—and while their literary merit today seems slight, they reveal a scientist with one shoe firmly planted in traditional mycology and the other skipping off in search of the unknown.⁵¹ One might be declared lunatic to suggest that Kenneth Raper, a respected mycologist with no literary pretensions and an authority on aspergillus and penicillium, might be a member of the “parallel” company, but his astonishing photography of the dictyostelids stands in relation to



Guttulinopsis sp. by Kenneth Raper

surrealism as Charles Tulasne’s illustrations of the pyrenomycetes did in the 1880s: they are marvelous and uncanny revelations of an alien world. Raper published his definitive monograph *The Dictyostelids* (1984) a mere quarter-century ago, yet in the reversion to the genomics of dictyostelium as the dominant paradigm in the study of this cellular slime mold, Raper’s seminal work is now utterly forgotten.⁵²

Parallel Mycology is not a tic of moondrunk *littérateurs*. Inclined phototropically like *pilobolus* toward the re-enchantment of the world, our eyes teem with entoptic infusoria that inhibit meaningless tears over the ineffable silence of the cladograms. Parallel Mycology never ceases to combat the scorn for the imaginary, ever encouraging transgression against science in the name of the marvelous. One day, it will discover what mushrooms are mycorrhizal with the Yggdrasil tree; establish the phylogeny of lilliputia and xenomyces; and penetrate the chronosynclastic infundibulum to advance our research on the exomycology of digital soma. In a vision, George Eliot saw man as a parasitical animal, “an epizoon . . . on the skin of the planetary organism,”⁵³ and Andrei Tarkovsky transposed this vision onto the oceanic planet Solaris, whose fungoids take part in the materialization of the products of memory out of time. It was Tarkovsky’s deepest belief that science had ruined the cosmos, and we should interpret the single close-up shot of a lichen in his film *Stalker* (1979) as the purest evidence of this. In this shot, Tarkovsky lavishes all the love and intellect that his creative genius could bring to bear on this single lichen as an unnamable inhabitant of the Zone, a parallel universe in our midst.⁵⁴ The subvisible world *is* a parallel world before our very eyes. We must steer away from the false magic of the digital pantechicon that fosters servility toward both technology and toward what is seen. Mushrooms provide, above all else, a window to the imagination, and we are only to cast our intellectual ray of light from this window (*à la* Emerson’s eyeball) to bring the fungi and all of nature crisply into focus. Guy Davenport opined: “The imagination is like the drunk man who lost his watch, and must get drunk again to find it. It is as intimate as speech and custom, and to trace its ways we need to reeducate our eyes.”⁵⁵ To optimize the optical we must pit the lyrical, the mycologically strange, against scientism and the ubiquitous prison house of technology that reinforces the tyranny of the visual. As Andre Breton asserted of the genesis of the surrealist image: “The eye exists in its savage state.”⁵⁶

Acknowledgment

Beaucoup thanks to Gary Lincoff and Sandy Sheine, whose keen appreciation of the wonderment of mycology helped me to aim a photon beam of good sense through a nebula of foggy notions to disperse them panspermatically off into the aether.

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