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"A Fourfold Vision: Nature Religion and the Wages of Scientism in Ursula K. Le Guin's 'Newton's Sleep'"

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Abstract: Ursula K. Le Guin's 1991 short story 'Newton's Sleep' begins in a utopic society that escaped the environmental and social calamity of a near-future Earth and created an enlightened culture on a space station. The group, led by a scientific elite, pride themselves on eradicating the irrational prejudices and unempirical mentality that hamstringed Earth; but chaos blossoms as the society struggles with the reappearance of religious intolerance, and becomes confused by an outbreak of mass hallucinations of the Earth they left behind. This narrative trope of the necessity of nature for the survival of humanity—physically, mentally, and spiritually—represents a new and relatively common allegory in contemporary science fiction in an era distinguished by separation from the natural world.

Keywords: nature religion; scientism; Enlightenment; Romantic movement; sublime; biophilia; Gaia hypothesis; technological nature

1. Introduction

Ursula K. Le Guin's 1991 short story, 'Newton's Sleep,' begins in what seems to be a utopic society on a space station, Spes (Special Earth Satellite). Spes's population is made up of refugees from planet Earth in a near-future where the planet has been ravaged by wars, environmental ruin, and economic catastrophe. This group escaped ecological and social calamity by building and then retreating to their self-created space station, where they intended to build an egalitarian and enlightened culture in their enclosed metallic ecosystem. The leaders of this new society, and the people who orchestrated the exodus from Earth, are a scientific elite whose careful planning extricated them from a dying planet. Over the course of a decade, like Moses leading the Israelites from Egypt toward the Promised Land, these engineers and scientists took a specially chosen few up from the washed-out Earth to their hermetically sealed space station, presumably never to return to the political and biological wasteland they left behind. But events take a turn for the dystopic when the station's residents begin to "see" elements of the Earth they sealed themselves away from in their literal bubble of science and rationality. These hallucinations begin with the station's children encountering ghostlike refugees, lurking the hallways and disappearing around corners when questioned, and culminate with an intrusion of flora and fauna on a massive scale—whales in the reservoir, buffalo stampeding through common spaces—in which the community rejoices, even as the situation spirals out of control.

The story is dystopic science fiction at its best; it is dark, unsettling, and just plausible enough to reach into the uncanny. Dystopic science fiction is, of course, in a sense a genre unto itself. It has always been the dark side of the unbounded enthusiasm of pre- and post-World War II sci-fi through the space age; while many science fiction visions of the future were optimistic. There has always been a strain of anti-utopianism within science fiction, with examples including Jules Verne's *Paris in the Twentieth Century*, published in 1863 but set in a technological and intellectual wasteland in the 1960s. But, in much of the science fiction published previous to the last quarter of the twentieth century, the genre often tended generally toward the utopian: technology was a relatively benign

force, social change was often a net good, and—while not without its political problems—religion was portrayed as either an artefact of an earlier civilization or, in its defeat, a symbol of the triumph of reason over emotion. But over the last several decades, and building on over a century of dark themes within the genre, decidedly un-utopic fiction—labeled "speculative fiction" by some—has increased in popularity, matching real life disturbance and disruption with visions of these current events taken to a logical end of cataclysm and disaster (Gregory 2015; Atwood 2011). While dystopic science fiction has existed more or less in tandem with other varieties of fiction, since the turn of the last century environmental distress (atmospheric pollution, deforestation, species extinction); economic disparity; advancements in genetic engineering technology (gene drives, gene therapies); sexual politics; and a rise of varieties of extremism (religious fundamentalism, violent political ideologies) have offered productive storylines for science fiction writers. Almost all of these fictions feature a "time after time," directly in contrast with religious or sacred "time before time"—a through line from modern day to a profane time-out-of-time (Eliade 1985). With rare exceptions, this "time after" is a portrait of destruction—a fractured society, an untenable political situation, a destroyed Earth, an apocalypse delivered not by an angry god but by a short-sighted human race. And it was these themes as genre that became part of the oeuvre of Ursula K. Le Guin.

The real dystopia inherent in Le Guin's "Newton's Sleep," however, is less the dangers of a post-apocalyptic Earth, and more the themes of scientism—the reductionist belief that only science can explicate reality—religious intolerance, and technology enabling a disconnection from nature. The break from nature in "Newton's Sleep" is profound; it is difficult to imagine a greater separation from the Earth-bound natural world than the technological wizardry of an orbiting space station. But the deeper lesson of the separation seems to be that the wages of a worldview focused exclusively on viewing nature solely as the sum of rational laws is chaos. Even though the story is a quarter century old, the important commentary for our twenty-first century brains is not just the breakdown of the Enlightenment view of nature and religion, but that separation from the Earth is something we are physiologically and spiritually incapable of sustaining. As we will see, the naturalness of nature on Spes appears to go both ways, and the attempt to seal nature out of the human experience has dire psychological, physiological, and spiritual consequences.

The story is part of Le Guin's short story collection, *A Fisherman of an Inland Sea*, and encapsulates many of her work's major themes: environmental consciousness, a spiritual connection to and religious reverence for the natural world, and technological imperialism (Le Guin 1994). The story's title is a reference to the poet and artist William Blake, who distinguishes Newton's Sleep—a scientific, rational, irreligious, empirical mindset embodied in the story's scientist caste—from a spiritual perspective that embraces what Catherine Albanese calls "nature religion." Albanese defines "nature religion" as "a symbolic center and the cluster of beliefs, behaviors, and values that encircles it"; specifically, nature religion is a form of "societal harmony" that allows individuals to forget "the violence of storm and tornado in the spectacle of nature's grand cooperation" (Albanese 1990). Nature religion encompasses a multitude of meanings, but most relevant for the interpretation of the situation that transpires on Spes is that it seems to "encourage the pursuit of harmony, as individuals [seek] proper attunement of human society to nature and thus mastery over sources of pain and trouble in themselves and others." Just as the scientific mindset so carefully cultivated on Spes begins to devolve, the resurgence of nature religion among the residents brings about a cooperation that defies explanation and transcends categories of rationality. Furthermore, nature has historically been "the embodiment of Spirt and the garment of God"—it often is "sacramental, an emblem of divine things that in some way actually *contained* the divinity to which it pointed." In nature religion, nature physically and spiritually represents the Divine; accordingly, on Spes, nature's presence redeems a spiritually bankrupt society through this collective encounter with the sublime.

The story's particular premise, however, is the sublimation of nature and religion in favor of science and technology, followed by the inevitable question: what happens to a society when it pushes away all forms of religious and natural life? What happens when individuals eschew or deny an

emotional and spiritual connection to the planet itself, and insist with fundamentalist fervor on the inherent rightness of empiricism to quantify and overrule nature? What are the consequences of taking the Enlightenment project to its logical end, and creating a technological nature that abides by an Aristotelian definition of *techne*—machine-like and imitative in quality—without its own teleos? If nature is sublimated—defied, imitated, turned into a carbon pastiche—will it remain excised, or—as Le Guin seems to assert—is Albanese correct that nature's grand vision of holistic and spiritual unity will reappear, with or without the consent of the reasoned masses? More specifically, for our purposes, "Newton's Sleep" is a story about humanity's physical, mental, and spiritual dependence on nature. Spes becomes the Romantic Movement as science fiction horror story, where the power of nature overcomes and completely envelops the technological, reclaiming the human with it.

The story touches on three themes that lend themselves to thinking about the relationship between religion and nature as it is treated in science fiction: nature religion and the experience of the sublime in nature; biophilia, or the inherent love of life by other living things; and the psychic cost of scientism/Enlightenment rationalism. Through the lens of Le Guin's story we can examine the premise that humans are physically connected to nature through the intertwined theories of the Gaia and biophilia hypotheses, and look in turn at the psychological effects of environmental depredation—a theory put forth by the residents of Spes themselves to explain their hallucinated adventures. Finally—and most significantly—we can explore the hypothesis that Le Guin's story is, in the end, a tale of nature religion roiling from out of the depths of mind, of reaching out from the void of scientism to experience the sublime, and builds on humanity's physical and mental need for the natural world to create a coherent and spiritual whole.

These themes of scientism, the sublime, and a physical, mental, and spiritual need for nature are embodied in the story's two main protagonists: scientist Isaac Rose and his daughter Esther. Isaac prides himself on having eradicated the irrational prejudices and unempirical mindset that hamstringed Earth by creating this new scientific society on Spes; his governing principle is empiricism: only that which can be measured matters. In contrast, Esther—who, like her Biblical namesake, is a spiritual savoir—longs for what they left on Earth with an intensity that tests her already difficult relationship with her father. In Le Guin's narrative, Isaac is an exemplar of the scientific mindset; he is a physical embodiment of the Enlightenment project, in which anything that cannot be quantified and proved by science—things proved by sight, and not by faith—are not real. The price that Isaac Rose pays for his rigid belief in the efficacy of science is spiritual bankruptcy and a loss of the observable world, one in which the ability to only see scientifically is the ultimate blindness.

2. Special Earth Satellite

In the story's opening scene, Rose brings his whole family to view the wasted Earth, recorded and preserved in videos available to the colonists in the station's AI. The AI is an encyclopedic computer system containing all relevant information and history pertaining to the now defunct Earth, as well as "vids" of the catastrophic environmental situation still unfolding on the planet's surface. As Earth succumbed to a global war brought on by environmental calamity and rampant economic disparity, families like the Roses fled disease, famine, ecocide, and war in a "hairbreadth escape," as Rose's pre-teen son Noah observes when the Colony's history is recounted to him and his fifteen-year-old sister, Esther. Isaac Rose's intention in showing his children the charred remnants of a nearly-dead terrestrial habitat is to head off the kind of sentimentality to which some of the Colony's members have been inclined in the years after their flight. He sneers at their "homesickness" for a broken planet and sees this focus on the past as a weakness. Rose feels no such sentimentality—no connection to the physical Earth or even to reminders of nature itself. In fact, Isaac views the AI as an "umbilicus" tethering the colony to a dark and dangerous history (he admits only to his wife Susan "I don't like it . . . I don't like to look down").

In keeping with his faith in science, when Esther asks why more people didn't do what they did and flee the Earth's surface for the safety of Spes, Rose answers,

> "Because most people aren't willing to trust reason . . . For a hundred years anybody willing to look at the world rationally has been able to see what's happening: resource exhaustion, population explosion, the breakdown of government. But to act on a rational understanding, you have to trust reason. Most people would rather trust luck or God or one of the easy fixes. Reason's tough . . . Reason's the compass that brought us through."

From the beginning, Rose's fixation is on the inherent rightness of a scientific, rational worldview as he literally looks down on what he sees as the result of unconstrained religion, emotion, and faith. He even contrasts their situation to a failed religious movement that preceded their satellite experiment by more than a decade; the Foys (or "fishsticks" as they derisively became known) followed a charismatic reverend who instructed his clergy to climb into rockets and be shot off toward an unspecified star a thousand light-years away. Presumably, the entire congregation died a slow, cold death in payment for their belief. "That was not people trusting reason," Isaac tells Noah. "That was people abandoning it in despair."

This introductory interlude—in which we learn the names of Isaac's immediate family are all Biblical (mother Sarah, daughter Esther, son Noah)—concludes with Rose confessing to his wife Susan that he looks forward to curtailing the psychological moorings to Earth. He wants to get rid of the vids when the group builds "the Big Ship and cut[s] free of the solar system," reasoning "what relevance is anything about earth going to have to those people?" The future colonists, Rose intones, will be free of the burden of a past on Earth and an emotional connection to their planet, because "the truth shall make you free," as he unironically informs his wife. For Isaac Rose, the truth is not the facts of history or the revelation of a prophet; for Isaac, "the truth" and material science are one and the same, an idea that, in his own way, brings him joy. Rose revels in his happiness, "a rational happiness" that eluded countless generations on Earth, but is now available to the residents of Spes. And, by Isaac Rose's calculation, he and the rest of the Colony were spared a terrible fate when they traded religious identity, individuality, gender equality, and cultural diversity for the security of orbiting the Moon. But, what Le Guin has in mind for the colony is a much darker portrait of scientism valued over spirituality.

From the early planning stages, Rose and others hoped the spirit of the Enlightenment will live again in their colony, and that Spes will become an example of the triumph of the scientific over religion, superstition, and determinism. Like his scientific namesake, Isaac Newton, Isaac Rose admires the smooth clockworks of his orderly society, kept free from human irrationality and the messy natural world by both distance and the exterior of Spes. But despite his uncompromising material and rational view, Isaac himself couches their journey to Spes in the language of religion. When his son comments that the family was lucky to have made it off Earth, Isaac corrects him, reflexively using language appropriated from his own Jewish upbringing: "Luck has nothing to do with it. Nor are we a chosen people. We chose. And we sacrificed. We chose, we sacrificed, and we were spared." In Isaac's case, he even sacrificed attending the funeral for his mother, Sarah, to remain in his decontamination dome in Bakersfield with the rest of his team as they prepared to evacuate the Earth. But Sarah had also chosen: years before, when offered the opportunity to join her son and his family on Spes, and to leave an Earth riddled with mutating viruses and radiation sickness that had killed over two billion people, Sarah "exploded." "'Live in that awful little thing, that ball bearing going around in nothing?'" she replied to Isaac's offer. "Forget it!" She died three years later, and her son rationalized her death as one more sacrifice he was forced to make in trade for safety and happiness. Isaac Rose's rationalism is his identity and saving grace, and he holds onto his scientific reason with a faith that eventually defies even the evidence of everyone's eyes.

The slide into mayhem begins, fittingly enough, when Rose is forced to confront the fact that religious identity still exists on Spes, and is leveraged as a form of difference. As the station's educators and senior scientists debate the necessity of teaching children geology—with a mother asking of Spes's children's education, "If down the line we decide to terraform the moon, for example, instead of building the Big Ship—hadn't [the students] better know what a rock is?"—the conversation turns sour. When one teacher relays how he taught his class an important lesson in chemical reactions by cooking

a pebble he took from Mount Sinai as a souvenir, another scientist snaps that the subject up for debate is "geology, not ethnicity!" The anti-Semitic dig is lost on Rose who, in his rational understanding of the scientific qualifications of the colony's members, fails to compute the insult. The depth of the offense is made clear when Esther becomes enraged at his obtuseness and stalks away, leaving his wife to explain that Esther has been called an anti-Semitic slur by the same scientist's son. The slur particularly bothers Esther because, on more than one occasion, she makes it clear that she identifies as Jewish and values her religious heritage. But where Esther sees an insult to her religious orientation, a typically myopic Isaac sees a failure of rational thinking and an aberrance caused by the influence of the Earth viewed through the colony's vids. "We can keep out every virus, every bacterium, every spore," Isaac tells his wife, "but this—this prejudice gets in . . . I think the monitors should be closed. Everything these children see and hear from earth is a lesson in violence, bigotry, superstition." There is no religion on Spes, he believes, and as with the Israelites in the desert, after the younger generation replaces the older all of this cultural memory will fade and everyone will be equal under scientific law. Isaac at first feels betrayed by his faith in Spes's purpose, but soon demonstrates a kind of willing disbelief—what in scientific circumstances Thomas Kuhn might identify as working "within the paradigm" of normal science—when he insists that science and the scientific culture of Spes will eventually conquer prejudice and social blindness (Kuhn 1996). Everyone, he decides, will eventually settle into a paradigm of rationality and find a way to make their colony work.

The story's great irony is that while Isaac metaphorically cannot see what is happening around him and is blinded by his belief in science, his daughter is literally blind. In a society of perfect genetic specimens and after several rounds of decontamination, Esther has undergone multiple eye operations and is forced to wear glasses that do little to curb her extreme nearsightedness. Despite being what Isaac describes as "helically flawless" due to her perfect genome, the only thing she can see clearly are enlarged displays on the monitors that Isaac abhors. But for Esther the AI's monitors are more than a way the legally blind girl can see, they are a lesson in what was lost when the colony chose Spes over Earth: music, language, literature, art, culture, religion. With her brother she listens to the opera *Satyagraha*, reveling in the orchestration of the *Bhagavad Gita* sung in Sanskrit. Alone and with her face close to the vid screen, Esther pulls up images from the AI of terrestrial landscapes, the great paintings of Western art, and black and white engravings. Enlarging the image on the screen to accommodate her impairment, she can see the heavy outlines of Goya's "The Sleep of Reason Engenders Monsters" (a choice that not-so-subtly foreshadows the story's finale) or the remains of Earth's natural spaces, and finds them consoling to her homesickness.

Compounding the uncomfortable realization that social and religious prejudices have made their way on to Spes, a debate also arises around the simulacrum of Earth preserved in Spes's interiors. Rose has long-term plans for eliminating the video landscape projections that fit like a holographic skin over living areas—projections of Florida, Colorado, Vermont—so that the next generation can grow up without "the pretenses of Earth scenery . . . just clean metal and ceramic." He believes that the simulacra of forests, plains, and swamps projected to cover the bare metal and glass of the station's interior are preventing Spes's children from growing up immersed in a representation of a totally rational and scientific reality, without the sentiment of nature or culture. As he plans the next iteration of the colony on a new space station, Isaac envisions a ship with "no fake scenery, no props; the curves and angles of the structure exposed. The structural elements [that are] rationally beautiful in their necessity."

Despite Isaac's dream of reason, an insurrection begins when two little girls spot a woman with burns over most of her body; when the girls follow her down one of Spes's meticulously sterile hallways, she disappears. When Esther questions the girls, they reply with youthful affectation that the woman looked like "those people that used to live where that was before the desert, right, Africa?" This particular revelation sparks Isaac and Esther's interest, as they both know that no one of African descent is on Spes. Isaac solemnly reflects on this fact in light of the rational decision he and the other senior Spes scientists made in choosing the best qualified candidates to be among the original eight

hundred—where "every single person must be fit, not just genetically, but intellectually"—and fails to see the racist, socially deterministic, and misogynist vein running through his "perfect" society. That there are almost exclusively only Caucasian scientists and their families on Spes (Noah makes a passing reference to the fact that there is a single Asian-American family in the colony) seems perfectly rational to Isaac, who attributes the representational disparity to inherent intellectual ability, rather than unequal educational and economic opportunity back on Earth. Esther, however, is reminded of her best friend back home, the fittingly named Saviora. Saviora was African-American and Esther's "best friend in the whole world," whom she was devastated to leave to go to the dome in California and decontamination. The recollection fills Esther with grief and fans the flames of teenage rebellion. But the African woman the little girls saw is just the beginning. Visions of people left behind on Earth—"ghosts", as they come to be known—accelerate into an outbreak of mass hallucinations of the Earth that until now only exists for Spes on the video monitors and in landscape projections. After the old woman come victims of a famine, then burned and starving children, and then still others who remind the space station's residents of the political unrest and social diversity they left behind. Isaac Rose watches in despair as one of his colleagues pauses in awe to observe a family of hunter-gatherers rinsing their food in a stream of water, all of which is invisible to Isaac.

After the ghosts, Spes's residents soon collectively witness the reemergence of nature—soil, trees, animals, fish: an entire biota—into their hermetically sealed space station. Noah excitedly informs his parents that he saw whales in the water reservoir, while Susan, Isaac's empathetic wife who grieves for the extended family she left behind, sees wild horses running through an open space. The community describes these hallucinations as a "shared experience," and understands the phantasms as a collective effervescence of the natural world, a definition that meets Durkheim's definition of a religious experience (Durkheim and Fields 1995). The only outlier to this shared miracle is Isaac who, in contrast to the meaning of his Biblical name ("he will laugh"), weeps with frustration at both the growing irrationality among his peers and the privilege of seeing granted to his family but denied to him. As everyone else's horizon expands to include the dead Earth, Isaac is imprisoned by "Newton's Sleep."

3. William Blake's Poetic Rebellion and the Culture of Newtonianism

The ghosts and the forests and the animals all exist as the mystical opposite of Isaac's hopes for the space colony; they fly in the face of his plans for a sterile, controlled, mechanized environment. Similarly, contained within the study of nature religion in Albanese is a history of attempting to control or curtail nature—to dominate it either through total conquest or through obliterating it via mechanization (Merchant 1989). This turn toward a mechanistic view of nature—atomized for the sake of science and stripped of the Divine—informed the work of William Blake, the poet, printmaker, and artist whose work straddled the Early Modern period and the Enlightenment. Blake was famously and fastidiously opposed to Enlightenment rationality and reductive measures that attempted to master nature, and railed in verse against his most-loathed unholy trinity: John Locke, Francis Bacon, and Isaac Newton. For Blake, these three men were responsible for a tyrannical understanding of nature that suppressed art, and reduced a spiritual connection between nature and the Divine to a profane clockwork. The reductionist perspective of nature dictated by empiricism was, to William Blake, an unforgivable sin and a wicked misuse of our holy relationship with God's creation.

Le Guin takes the story's title from a poem by Blake that is a meditation on the necessity of nature for spiritual growth and emotional fulfillment. The poem was part of a letter Blake sent his friend Thomas Butts, dated 22 November 1802, in which the author explains he composed the poem while walking in the countryside. In it, Blake details a vision that involves the heavens opening, angels, devils, "fairy elves, and little devils who fight for themselves" all clamoring about him, as he contemplates the terrestrial and familial in contrast to the spiritual dimensions of the natural sphere around him (Blake et al. 1996). The spectacle washes over Blake, and in the final stanza he ruminates on Newton and his mechanical philosophy taking measure of the world. As the narrator, Blake writes:

"Now I a fourfold vision see
And a fourfold vision is given to me
Tis fourfold in my supreme delight
And three-fold in soft Beulah's night
And twofold
Always . . .
May God us keep
From Single vision & Newton's sleep"

Blake's poem begins by praising the ability of poets and artists to accept knowledge and enlightenment from the natural world; the "fourfold vision" recalls an earlier era in natural philosophy, when the goal of the nascent practice of science was to understand God's greatness by reading "the book of Nature." More than this, though, the power of fourfold vision is the poet's ability to hold together reality as it exists, cognitive awareness, nature, and the cosmos; it is an all-too-brief glimpse of what it must be like to see as the God. The significance of the fourfold vision is "basic to the paradoxical fulfillment of the poet-prophet's experience. Fourfold vision, or fourfold anything for that matter, is a fallen description of infinite perfection, of unfallen Oneness. That is, four is really one all the time, but in order to describe unlimited perception, a paradox is stated. What appears as four *is* one" (Rose 1964). In other words, fourfold vision for Blake is the ability to hold all of creation in dynamic tension in one's thoughts, and express this experience of the sublime through poetry. Three-fold vision is "sense to [Blake's] symbols . . . one on the plane of human social intercourse, one on the plane of psychology, one on the universal, because as man so the Kosmos" (Guthrie 1897). "Beulah" refers to a verse from Isaiah 62, in which the LORD promises to both remake Jerusalem and marry His land. "Thou shalt no more be termed Forsaken; neither shall thy land any more be termed Desolate," Isaiah extols, "but thou shalt be called Hephzibah, and thy land Beulah: for the LORD delighteth in thee, and thy land shall be married" (American Bible Society 2010). Beulah—both in Isaiah and Blake's vision—carries the double meaning of translating to "married" and being the name of a literal place.[1] Twofold vision is to simply see objects as inert signifier and referent, and to fail to recognize their symbolic value (to see fire as merely an element, for example, rather than something that can give warmth or as a symbol of destruction). The poem's layers of subtlety and meaning are less important, however, than the final warning. Blake's last injunction is against "*Single vision & Newton's Sleep*," where "single vision" and "Newton's Sleep" are synonymous for an unyielding attachment to scientific materialism and pure rationality, which Blake saw as the curse of the philosophical mindset that arose in imitation of Isaac Newton. And in this poem, as in the other ninety times Newton is mentioned or depicted in Blake's collected works, Newton's name functions essentially as a heuristic for the act of scraping the holy from nature and diminishing the natural world to a ticking clockwork—mechanical, reduced to scientific laws, and adamantly not infused with the divine.

Scientific rationalism, an emphasis on mechanics, empiricism, and the beginning of what Stephen Shapin has called "the house of experiment" over practices that favored observation of the natural world characterized the Enlightenment's coincidental rise of Newtonianism (Shapin 1988). This culture of Newtonianism—a scientific attitude and methodology based on Newton's theories of mathematics and physics—was built on the veneration of the life, work, and rationalist thought of Isaac Newton (Force and Hutton 2004). With Newton as North Star, a generation of intellectuals tried to pry rational laws from the philosophical and religious assessments of the natural world that had informed the work of previous generations of theologians and theorists. Enlightenment thinkers esteemed mathematics and physics above an historical preference for reading "the Book of Nature," God's work writ large in the natural world, in imitation of the hero who stood on the shoulders of giants.

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[1] "Hephzibah" means "my delight is in her."

What is, of course, ironic is that Newton himself was a natural philosopher *par excellence*, in that many of his experiments were in service of discovering the mechanism of God's action in nature. Newton's private experiments with alchemy and his extensive theological and prophetical study of the Hebrew bible were, in his own time, more in keeping with the desires of his predecessors to comprehend the Divine by "reading" God's Book of Nature than in creating a new scientific philosophy (Dobbs 1991). But the public face of Newton was the purveyor of the doctrine that forged the Enlightenment and enraged William Blake. Newtonianism was a movement carefully cultivated by Newton and spread throughout England's universities by his influential acolytes (Shapiro 1971). This philosophy of meticulous rationality was based on a fundamentally mechanical view of the natural world, which preached Newton's maxim that the universe was governed by reason and by mathematical laws set into motion by God; this, in turn, suggested a universe created and observed by God but in which he did not necessarily abide. The turn toward rationality and away from the pervasiveness of the Divine were the founding principles of Enlightenment philosophy and science, culminating in the empiricist, rational science extolled by Isaac Rose.

The nineteenth century response to stripping the spiritual from nature during the Enlightenment was the Romantic movement, which swung back toward embracing the mysterious, the terrifying, and the beauty of the natural world. In art, philosophy, literature, and religion, the governing aesthetic of the Romantic movement was the *sublime*. Although it dates back to ancient Roman times, the concept of the sublime as it influenced the Romantic movement—and appears on Spes—originates with philosopher Edmond Burke. In his 1757 book, *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful*, Burke famously separated the sublime from the beautiful. Burke defines the sublime as any object or moment that can produce "the strongest emotion which the mind is capable of feeling," such as terror, pain, humility, or love (Burke 1958). Just a few years later, Immanuel Kant revised this characterization of the sublime as external to the mind as instead something that arises from our own perceptions. In Kant's philosophy, the sublime is product of our observations of things that are so splendid and magnificent that we are filled with an awe that bends our own reality (Kant 1960). In this attempt to cognitively grasp the immensity and beauty of nature, of the cosmos, or of the sacred, a struggle ensues between the imagination—the senses—and reason; we cannot grasp the that which is sublime with reason alone. Thus, on Spes, when the natural world comes roaring back, the reasonable and the scientific are no match for the terror and the power of the sublime. Spes becomes the Romantic movement unhinged: the power of nature transcends the imagination to apprehend the absolute and the holy.

As with history, so with the residents of Spes: not unlike how the first great cultural experiment in straining nature out of science rebounded off the eventual rise of Romanticism in the nineteenth century, so does the philosophy of single vision fail in the face of uncompromising reason on the space station. The sleep of reason has indeed engendered monsters. And just as the backlash against Newtonian science and empiricist Enlightenment philosophy sent the early scientists back to the natural world in droves, abandoning laboratories for exploratory voyages and comparative studies in life sciences such as botany and anatomy, so do the scientists of the exclusive satellite abandon cold reason for heartfelt wonder. Romantic science returned to the sublime in the same way that the colonists embrace nature, and only Isaac Rose is left with his belief—and his fear.

4. Physical Connection to Nature

This tension between the mechanistic, scientific worldview and the resurgence of the natural world in Isaac Rose's scientifically meticulous colony is the premise of Le Guin's story not only because of its chilling effects, but because the sense that the natural world is dying is one of our most pervasive cultural fears. While our blue marble is still dynamic and alive, the dystopian nightmare of the dead Earth that horrifies Esther isn't a stretch for our collective imagination. The Earth the Spes colony fled, Isaac reminds his children, had been dying for generations. The fictional unwillingness to act in the face of the problems Isaac lists—resource exhaustion, population explosion, governmental

breakdown—reflects our contemporary anxiety about lack of action taken against climate change or social and income inequality. But what Isaac Rose leaves out—and what eventually triggers the return of Earth to Spes—is that the Earth can't ever be dead as long as humans are alive. In addition to the spiritual and emotional satisfaction humans receive from nature, Rose's precious rational science has revealed in the last half century that our connection to nature is profound and that the experience of the sublime in nature might not just be spiritual or psychological in origin. Our relationship with nature as human beings, as it turns out, is part of our evolutionary heritage: we are contained within a self-regulating, complex system, with which we co-evolved and continue to develop. In other words, we are not organisms that live on the Earth—the Earth is an organism with whom we co-exist.

In 1971, chemist James Lovelock, along with microbiologist Lynn Margulis, formally proposed the theory that the Earth was more than a planet. In Lovelock's definition, the Earth is "a complex entity involving the Earth's biosphere, atmosphere, oceans, and soil; the totality constituting a feedback or cybernetic system which seeks an optimal physical and chemical environment for life on this planet. The maintenance of relatively constant conditions by active control may be conveniently described by the term 'homoeostasis'" (Lovelock 1987). Lovelock's hypothesis came out of his extensive study of the chemical composition of the atmosphere of Mars, in an ongoing experiment to find evidence of life on the red planet at the Jet Propulsion Laboratory (JPL). What struck Lovelock and his fellow researchers in their study of first Mars, then Venus, was that the atmospheres of our planetary neighbors are in a state of complete chemical equilibrium—all chemical reactions and their by-products have achieved a state where there will be no further reactions or changes. This atmospheric equilibrium is in striking contrast to Earth's atmosphere, which is in a constant state of disequilibrium and molecular upheaval. The conclusion Lovelock and the scientists at JPL reached was that this chemical equilibrium on Mars and Venus meant that the planets were effectively dead: without life, there could be no oxygen, methane, or nitrogen in their atmospheres, all of which are present in Earth's atmosphere and all of which are by-products of organic life. Lovelock, Margulis, and others soon developed from this concrete result a theory that our planet's homeostasis was not only a sign of life on Earth, but that the Earth is actually a living entity. Moreover, they speculated that humans did not evolve *on* the Earth, but rather *with* the Earth. We—all of life—are a part of the symbiotic process writ large, Lovelock explained. And in reference to the Titan who was the mother of all the gods and the planet they ruled, they called their theory "Gaia."

One aspect of the theory, later expanded upon by biologists such as Edward O. Wilson, is that humans have an innate love of nature. More than just aesthetics, human beings are evolutionarily "programmed to recognize instinctively our optimal role in relation to other forms of life around us," and "when this relationship with our environment is spoilt or mishandled, we suffer from a sense of emptiness and deprivation" (Lovelock 1987, p. 134). For Lovelock, this love of the natural world and affection for beauty "does not seem inconsistent with the Darwinian forces of evolutionary selection for a sense of pleasure to reward us by encouraging us to achieve a balanced relationship between ourselves and other forms of life" (p. 134). The theme of evolutionary reasons for humanities need for and kinship with nature arises from Wilson's work on the concept of biophilia. Wilson popularized the biophilia hypothesis as "the innate tendency to focus on life and lifelike processes" (Wilson 1984). For Wilson, life on Earth is characterized by our ability to recognize life; from our first moments of cognition we "learn to distinguish life from the inanimate and move toward it like moths to a porch light." He writes that "to explore and affiliate with life is a deep and complicated process in mental development. To an extent still undervalued in philosophy and religion, our existence depends on this propensity, our spirit is woven from it, hope rises on its currents" (p. 1). Because we understand other organisms as living, Wilson hopes that we "will place a greater value on them, and on ourselves" (p. 2). In other words, life calls to life, and one of humankind's most intrinsic instincts is the recognition of and value for life in all of its forms. It is an instinct that goes beyond evolutionary concepts of cooperation; according to Wilson, it is baked into our bodies, minds, and "cascades into repetitive patterns of culture across most societies" (p. 85).

Both theories—the Gaia hypothesis and biophilia—have been subjected to a fair amount of evaluation and criticism; both theories are problematic in their own way (Joye and De Block 2011; Pigliucci 2014; Williams 1992). In particular, the Gaia hypothesis has been critiqued negatively for being "too religious" (for further reflections on this idea, see (Deane-Drummond 1993) and (Ruse 2013))—for evoking gods, dancing around concepts of sacrality, and delving into realms where science ebbs into spirituality. But both theories provide insight into the unraveling of Spes's residents. As Isaac mourns the loss of his scientific promised land, Susan comforts her husband as best she can. As Susan explains to Isaac, "How could we have thought we could just leave . . . All it is, we brought ourselves with us. The horses and the whales and the old women and the sick babies. They're just us, we're them, they're here." Susan's words point to a realization of the interconnectedness of life and the biophilia that is the psychic center of nature religion: the evolutionary imperative to recognize and love the natural world with which humans co-evolved. A feeling of reverence for the mystical visions of the natural world they've left behind highlights a growing realization that nature is sacred; as they sink further into the sublime the people of Spes distance themselves from Newton's Sleep—from one-dimensional vision and scientific materialism—and fall head first into Blake's "fourfold vision" of life, love, beauty, and the natural world.

5. Nature Deficit Disorder and Technological Nature

While Esther is confined to the hospital for what is ultimately a failed eye transplant, Noah visits with news of the ghost-like refugees and the slow unfolding of the return of Earth's ecosystem to the sterile geography of Spes. "Dad got himself on this Emergency Committee with mostly psychologists," Noah informs Esther, "and they have it all worked out about mass hallucination and environmental deprivation and like that." Isaac, however, in his coldly rational way, does not believe either in so-called mass hallucinations, and feels strongly that Spes is a beautiful environment—could the other residents truly feel deprived of the natural world, when their facsimile is so perfect? While Isaac unsuccessfully tries to convince his colleagues that what they are seeing is a "group delusion," the spiritual and emotional satisfaction that the scientific community finds in the ghosts and the wildlife help them overcome their fears of their "shared experience" of the natural world. This sense of joy in the returned Earth mirrors two important contemporary psychological conclusions about nature, mental health, and physical well-being: nature deficit disorder and the mediating effects of technological nature.

The first was proposed by journalist Richard Louv in his 2005 book, *The Last Child in the Woods*, which chronicles what he believes are the effects of a lack of connection with or time spent in nature on children. Louv recounts the research indicating that the behavioral and physiological concerns surrounding the lives of twenty-first century children—obesity, type II diabetes, Attention Deficit Hyperactivity Disorder (ADHD), depression, even myopia—are a symptom of a larger problem: a separation from and lack of intimate experience of nature (Louv 2005). Louv's objective is to bring attention to the understudied issue of the cognitive price children pay by spending their play time sitting on a couch rather than exploring the outdoors. "Nature deficit disorder," Louv explains, "is not a formal diagnosis, but a way to describe the psychological, physical and cognitive costs of human alienation from nature, particularly for children in their vulnerable developing years" (Louv 2009). Our separation from nature, he writes, takes a physical and psychological toll on children, which results in children needing to be medicated with everything from insulin to Ritalin. While nature deficit disorder has been criticized as a misdiagnosis and an oversimplification of a much larger societal problem, Louv's stated point was not to get the malady into the DSM but to raise awareness of the possible correlation between psychological impairment in a generation of children and the fact that these children spend the majority of their time indoors (Dickinson 2013). In particular, Louv and a phalanx of journalists, social scientists, child psychologists, educators, and so-called "mommy bloggers" lament the scourge of "screen time": the amount of time a child spends in the average day looking at a computer, television, tablet, or cellular phone screen. The "average day" of screen use for American children totals something on the order of 7 hours, and includes everything

from passive television watching and Internet browsing to a more active engagement with peers via video gaming. An overabundance of screen time can lead to physical and psychological effects, including an "impact on virtually every health concern that practitioners and parents have about young people, including aggressive behavior, risky sexual behavior, substance use, and disordered eating" (Strasburger et al. 2010). While psychologists suggest that screen time is not entirely responsible for aggressive behaviors or abuses in children today, what they caution is more in keeping with the spirit of Louv's thesis: too much time indoors in front of a screen is mentally, physically, and possibly morally unhealthy.

These problems, however, are not limited to children: adults are prone to the same psychological issues that affect children, and possibly for the same reason. Diagnoses of depression, anxiety, and other common mental disorders seem to disproportionately appear in the context of urban lifestyles; anxiety, in particular, is a malady that seems to afflict city-dwellers at levels unequal to their counterparts in more rural or even semi-urban areas (Martyn and Brymer 2016). The proof that a deficiency in nature leads to negative health outcomes seems to be in the cure; numerous studies have shown how even just a moderate exposure to nature for a minimal amount of time can dramatically reduce the particular plagues of depression and anxiety (see, for example, Raichlen and Alexander 2017; James et al. 2016; Williams 2016; Anglin et al. 2013).

Ironically, the comfort Esther finds looking through the vids of the Earth resonates with a series of experiments conducted by ecopsychologist Peter Kahn. In one experiment, Kahn and his colleagues measured the relative happiness of workers in a campus building (and we all know how dire the interior of campus offices can be), comparing those with a window view of trees and an open space to those with a flat screen television displaying images of the outdoors, to the happiness of people in offices with no windows or televisions. Based on outcomes measuring physiological responses over sixteen weeks, workers with the view of nature recovered nearly twice as fast as their windowless colleagues from low level stress, and workers with "technological windows" did nearly—but not quite—as well. Kahn's conclusion is that "even though a technological nature window," such as Spes's videos of Earth, "might look like a window, have a view like a window, and by used by people as a window, it does not confer all of the physiological and psychological benefits of a glass window view of nature" (Kahn et al. 2009). Similarly, Esther's lonely forays into peering through the computer screen at what remains of the natural world brings her a sense of happiness and peace that "nature religion seem[s] to encourage." The almost-but-not-quite technological nature that she sees through the AI are comforting because, in the total absence of the natural world, even a facsimile of nature can ease an aching soul. But the vids do not go far enough in easing her sense that something has gone very wrong.

Kahn expands on this research in his book *Technological Nature: Adaptation and the Future of Human Life*, in which he reminds his readers that human "minds and bodies came of age hundreds of thousands of years ago, and thrived through patterns of interactions with the natural world" (Kahn 2011). While he has his own criticisms of the biophilia hypothesis as it relates to human psychology, Kahn powerfully argues that people "cannot jettison all of these interaction patterns [with nature] and still thrive as a species" (p. 24). We need instead to rethink our concepts of what it means to be human, to "integrate a nondeterministic and nonmechanistic conception of human beings." Part of Isaac Rose's blindness is his reductive belief—compelling evidence to the contrary—that humans are the sum of their genes and the functionality of their minds and bodies. By denigrating feelings such as homesickness, nature deprivation, and religious belief as irrational and weak, Isaac is denying a holistic concept of what it means to be human: mind, body, soul. By insisting that Esther have four eye operations by the age of sixteen—operations that she doesn't want and maintains she doesn't need—Isaac is diminishing his own fierce, bright, religiously-perceptive daughter to a physically flawed machine, one that can be repaired by switching out one pair of eyes for another. It is possible that not only has Isaac's "single vision" kept him from seeing the larger picture on his space station, but has kept him from understanding his own physical and emotional need for an experience of the sublime.

6. Nature Religion

By the end of the story, nature's abrupt reappearance in the cascading social and mental disarray culminates in mass hallucinations of a scale that almost completely resurrect the dead Earth for the residents of Spes. "It's going backwards," Noah tells his father—"it" being the culture of Spes as well as the history of Earth they collectively see played out in their visions. The apparitions that began with ghosts of people left behind on Earth quickly become real encounters with the natural world intruding even on the domestic sphere. Isaac is distraught to see Noah become transfixed by the goldfish that flow out of the faucet into the bathroom sink, and argues with Susan, who tenderly looks after the scarlet runner bean vine that begins to grow next to their front door. He rages at his colleagues, his neighbors, his fellow refugees—and when his wife gently asks him to have faith that what they are all seeing is real, he sobs his sarcastic reply: "Believe because it's unbelievable. Who cares about understanding, anyhow?"

The impromptu nature religion that rolls through Spes highlights the universality of nature religion, and illustrates how nature is not merely a *material* resource, as Isaac believes, but also a *spiritual* resource. The residents of Spes undergo a spiritual rejuvenation with the reappearance of the natural world and quickly forget the ephemeral nature (as it were) of their visions. They rejoice in each new development—running with bison down the hallways or playing impromptu football games in the mud on what used to be plastic astroturf—and, as Noah observes, move backwards toward a spiritual sense of oneness with the lost Earth. As Le Guin demonstrates, the wages of "Newton's Sleep" as defined by Blake seem to be a detachment from the sublime, but that detachment will lead to a forceful reemergence of the natural world and, for those not too far gone, a reconnection with a spiritual center.

The story's denouement finds Isaac the final hold-out on Spes who cannot see nature, except for one: Esther remains in the hospital with what is diagnosed as permanent blindness after her body rejects the eye transplant. When Isaac in despair seeks out the only other blind resident of Spes, he is told by the hospital staff that Esther left several hours ago, that a note arrived from her mother releasing Esther that morning. When Isaac demands to know who brought the note to the hospital, the nurse cheerfully explains that it was the "little black girl," whom the reader recognizes as Saviora, Esther's best friend from Earth, who offered to be Esther's eyes after her first failed vision correction operation. The note Isaac is handed, however, is not from Susan: the note is in Esther's handwriting and simply says, "I am going up to the mountains for a while." Isaac leaves the hospital to find his blind daughter, comforting himself that "nobody could be lost in Spes": all hallways and corridors are a masterpiece of reason and functionality, inexorably curved inward to form a complete circle. Isaac reminds himself that he knows "all the intervals, all the specifications, all the materials, all the relationships" of his home. "He had them all in his mind. He had thought about them for years. He had reasoned them," Le Guin explains. But as he sets off down the corridor in Area 8 to find Esther, he trips over a rock and falls. The rock bulges from the smooth metal floor, white and yellowed with lichen and grey with all the ages of the Earth. And finally, Isaac understands. He stands up and calls to his daughter, "Esther, I can't see. Show me how to see!" In a space station, orbiting the Moon, where religion and nature have both been sacrificed on the altar of reason, the return of both to the man cursed with single vision is a moment of redemption.

Scientific materialism is forced to have faith that:

> I will lead the blind by ways they have not known,
> along unfamiliar paths I will guide them;
>
> I will turn the darkness into light before them
> and make the rough places smooth.
> These are the things I will do;
>
> I will not forsake them. (Isaiah 42:16)

Even the coldly rational Isaac Rose finally wakes from Newton's Sleep, and follows Esther out of the metal and ceramic hallways of Spes up into the "mountains"—the corridor grows steep and the air becomes cold and thin as he traverses the summit of a granite peak. Following the vision of his blind daughter, at the top of a mountain Isaac finds Esther and his long-dead mother Sarah waiting for him. Having finally overcome the single vision Blake warned against and his own scientific materialism, Isaac is ready when Esther tells him, "Now we can go down."

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