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# Can Science Be Unified? Oneness and its Discontents

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Deep within we long for unity because, at the most fundamental level, *we are already one*. We belong to one another because we have the same source of love; the love that flows through the trees is the same love that flows through my being. . . . We are deeply connected in this flow of love, beginning on the level of nature where we are the closest of kin because the Earth is our mother.

– Ilia Delio, *The Unbearable Wholeness of Being*

A framed poster outlining the features of Earth System science hangs in the hallway of my office building. Beneath a graphic depicting the various interlocking spheres of planet Earth—biosphere, hydrosphere, atmosphere, and so on—a well-known quote from T.S. Eliot’s “Little Gidding” appears, without additional comment or context:

“We shall not cease from exploration  
And the end of all our exploring  
Will be to arrive where we started  
And know the place for the first time.”

Read in the context of Earth System science (ESS), a holistic approach that transcends disciplinary boundaries and treats Earth as a unified complex system, Eliot’s theme of arriving at the beginning by coming to an end might suggest many things. One possible reading is that the establishment of ESS affirms unity as the original condition, the place

where we started. The “end” referenced here might signal the arrival at a form of knowledge so new and complete that it alters everything in its wake. Eliot’s lines were composed decades before the world witnessed the view of Earth represented on the poster on my office wall—the now-ubiquitous “Blue Marble” image made possible by humanity’s sojourn into space. Only by *leaving* Earth were we able to discover it, to know the place for the first time, to know it as it really is.

Knowing Earth in this way changed everything.

Or so we are told. Apollo 8 astronaut Bill Anders, who captured the famous image of “Earthrise” during lunar orbit on Christmas Eve 1968, expressed some such sentiment when he remarked that “we came to explore the moon and what we discovered was the Earth.” Earthrise, and the Blue Marble image that followed in 1972, inspire frequent paeans to unity and solidarity—the organic unity of Earth itself, a totality not perceptible from *within* Earth’s confines, but only from without—and the purported oneness of humanity. As celebrity astrophysicist Neil deGrasse Tyson often remarks, the Earth seen from space reveals no boundaries, no color-coded countries. The newfound cosmic perspective on our planet was, in Tyson’s oddly inorganic phrase, a “firmware upgrade” for humanity that permanently installed the thought of global oneness.<sup>i</sup>

Unity’s appeal seems ancient and abiding. But is it universal? Science historian George Sarton once suggested that there are two kinds of people: those who “suffer a tormenting desire for unity” and those afflicted with no such longing. Reaching back through Western history, grand unificatory projects have often set themselves against a perceived “adversity of diversity,” as historian of biology Vassiliki Betty Smocovitis argues in *Unifying Biology*.<sup>ii</sup> Unity asserts itself again and again, against the confounding *manyness* that threatens an orderly universe. Smocovitis examines the role of this tormenting desire in the history of science, while noting some of its prominent antecedents:

From Heraclitus, who sought the one in many, to Plato, who cherished the unity of knowledge, to the Enlightenment philosophers who sought to unify the branches of knowledge within a systematic and universal scheme, to the generations of positivists who dreamt of unifying the sciences, the narrative of the intellectual history of the West includes tales of heroic figures seeking unity in diversity, eternity within impermanence, and order in disorder.

To this list we should add Christian monotheism, which incorporated elements of transcendent Platonic oneness. God's oneness ratifies a belief that the organization of all knowledge reflects God's creation and governance of lawlike nature. The fact that the world, or the cosmos at large, presents to us a uniform structure suggests a unity in its cause. The drive to uncover an underlying unity ends at the beginning.

The main focus of Smocovitis's work is the so-called Modern Synthesis in biology, which integrated Darwinian natural selection with the burgeoning science of genetics in the 1930s and 40s, but the synthetic impulse has continued its forward march, well beyond the heady years of the Modern Synthesis. Biologist E.O. Wilson, perhaps the most celebrated and controversial scientist to command a wide audience in the last fifty years, proudly labeled himself a "congenital synthesizer." The unification of knowledge was a longstanding, defining agenda of Wilson's entire career. In the 1970s, he invoked unification in characterizing sociobiology as "the new synthesis." Wilson's bold new synthesis sought to biologicize (his term) the social sciences, so as to integrate them more fully into the Modern Synthesis. Defined by Wilson as "the systematic study of the biological basis of all social behavior," sociobiology aspired to a "new holism" by way of reductionism.

Consilience, Wilson's later synthetic project, went further in its dream of incorporating even the arts and humanities into a single explanatory framework, a vertical integration of all disciplines. Wilson understood consilience to resume the courageous Enlightenment quest for a unified

theory of knowledge. Chief among his heroes were the logical positivists (sometimes called the logical empiricists), a philosophical movement that emerged in Vienna in the 1920s. These thinkers similarly tried—and failed—to unify the sciences. There is almost no one who currently believes in unity of science in the strong reductionist sense championed by some of the logical positivists. However, Wilson insisted that their failure was due to a missing puzzle piece, a temporary state of ignorance—now remediable—regarding how the brain works. “That in my opinion is the whole story,” Wilson concludes. If the logical positivists abjured, or claimed to abjure, metaphysics, Wilson avidly embraced unity of all knowledge—not just science—as metaphysical, even a religious quest. Steeped in early life in the Southern Baptist tradition, he felt “no desire to purge religious feelings” as he transferred his affections from organized religion to totalizing science. Belief in consilience across all the branches of knowledge was for Wilson “a metaphysical world view,” plain and simple. Once we have accumulated and synthesized enough certain knowledge, he believed, we will understand who we are and why we are here.

For believers in oneness that which is not unified is fragmentary, confused, chaotic, blinkered, disjointed, and threatening. Wilson sought to claw the academy, and society generally, back from the engulfing chaos of disciplinary disarray and social arrangements that had emerged willy-nilly. Disintegration, disorder, manyness—these are not “reflections of the real world,” he insisted, but an artifact of the highly contingent and haphazard way in which the disciplines and society as a whole have evolved. Unity is built into the structure of reality. Wilson offers a diagnosis similar to Sartre’s commentary regarding two types of people. While acknowledging that disorder plays an instrumental and catalyzing role in the march of progress, Wilson maintained that order unfailingly triumphs in the end:

I suggest that there have always been two kinds of original thinkers—those who upon viewing disorder try to create order, and those who upon encountering order try to protest it by creating disorder.

Tension between these modes of thought advances the trajectory of scientific progress Wilson argues, “and in the Darwinian contest of ideas order always wins, because—simply—that is the way the real world works.” Scientifically-minded Enlightenment thinkers receive an especially warm reception from Wilson; his highest praise is reserved for Francis Bacon who astutely labeled confusion the “direst of errors.” Wilson enumerates his reasons for admiring Bacon, but he is especially appreciative (and seeks to emulate) Bacon’s “full employment” of the humanities, art, and fiction as vehicles for expressing the truth and order revealed by science. Science—both Bacon and Wilson concur—“should be poetry, and poetry science.”

What can this pithy prescription mean? In practice, it entails that the truth of science is best captured and conveyed in familiar (and evolutionarily engrained) literary genres—creation myths and epic tales. Humans, on this account, are primed by evolution to seek and respond to a coherent, all-encompassing myth. Wilson proposed the “evolutionary epic”—the grand story of life unified under the banner of evolutionary theory—as the best myth we will ever have to orient humanity toward a common understanding of who we are and why we are here. “The true evolutionary epic, *retold as poetry*, is as intrinsically ennobling as any religious epic,” said Wilson.

Note, however, that the arts and humanities are relegated to an emotive and aesthetic role, tasked with providing a vaguely religion-shaped vessel for conveying the order revealed by science. In unificatory projects like Wilson’s, the arts, humanities, and religion have rarely been equal partners with the sciences in the synthesis that emerges, for it is science that provides the unassailable content to which the other disciplines lend enchanting embellishment and flowery form. Whether this situation has improved in recent narratives emerging from Earth System science, and attendant “Anthropocene” frameworks, is a subject we will return to shortly.

Clearly, for those in its thrall, unified knowledge has more than intellectual appeal. An aesthetic epistemology compels unificatory

projects that seek meaning in an all-embracing holistic cosmology, a “poetic weltanschauung, fulfilling an intellectual project that began with the very origins of the narrative of science in Western culture,” as Smocovitis writes. For his own part, Wilson describes his attraction to order and unity as a form of “Ionian Enchantment,” by which he means belief in the unity of the sciences—“a conviction, far deeper than a mere working proposition, that the world is orderly and can be explained by a small number of natural laws.” Wilson, who recently passed away after a remarkably long and prolific career, did not undertake the construction of a science-based myth himself, but he inspired many would-be synthesizers and eager mythmakers in his wake.

Only some of these seekers can properly be called reductionist thinkers, but all believe that a shared story of humanity, a new cosmology rooted in science, is the remedy for a host of modern ills induced by contemporary conditions of *amythia* or mythlessness. Among these are a coterie of ambitious cosmic storytellers about whom I have written at length elsewhere. These narrators of the “Universe Story,” the “Epic of Evolution,” and “Big History” endeavor to tell the whole story of humanity, life, and the universe from the moment of inception in the Big Bang, up to our present, perilous Anthropocene age. These narratives aim to instill a “sense of common evolutionary heritage and shared genetic lineage.” Kinship—our shared past—provides the foundation for the flourishing of a shared planetary community into the future. Part science, part myth and religion, these stories weave together the various branches of knowledge to produce a new story—“*everybody’s* story”—crafted to inspire cosmic reverence and a collective sense of wonder, purpose and belonging.

As should be apparent by now, unifying stories are also, often, origin stories. Exploration ends at the beginning. Smocovitis’s history of efforts to unify evolutionary biology commences with a reference to William Blake, and Blake’s 1807 painting, *The Fall of Man*, graces her book’s cover. The painting presents a synoptic view of the Fall. Christ appears at the center, leading Adam and Eve by the hand out of the Garden of Eden. Two trees stand behind the three main figures, the Tree

of Life and the Tree of Knowledge of Good and Evil, the latter encircled by the serpent. This image and story may seem far removed from the realm of science, whose origin story is often assumed to have supplanted the Biblical account. But the quest to unify and reconcile is common to both science and religion. Though they are often placed in opposition to one another, science, myth, and religion share a similar quest for universal and absolute truths; all array themselves, Smocovitis writes, against those who would repudiate transcendent truths “in favor of local, relative, or otherwise ‘embodied,’ ‘contextual’ forms of knowledge.”

If indeed science, myth, and religion (or at least *some* religions) share universalizing and totalizing tendencies, then imagine this trio joining forces to advance a worldview whose central message *is* oneness. This is precisely what we find in science-based cosmologies—stories of the universe, evolutionary epics—that place humanity within the unfolding story of the cosmos. Can we discern a similar harmonic convergence of science, myth, and religion in contemporary discourse of Earth System science and the Anthropocene?

Let us return to the images of the “whole” Earth and the Earth System: Among those who yearn for unity and oneness, there are many who readily affirm that to grasp Earth in its oneness is to understand it as it *really* is. In yet another puzzling turn of phrase, Neil deGrasse Tyson describes the view of our planet from space as “Earth the way nature had intended.” (Did nature intend that humans should view Earth from a remote location? What is nature, apart from Earth?) For James Lovelock, the British atmospheric chemist who first proposed the Gaia hypothesis from which Earth System science sprang, seeing Earth from space is seeing it “in reality ... as it really is.” Apprehending oneness, then, is two-step proposition that begins with *zooming out*, temporally, spatially, or both. This includes looking back through deep time as with big histories and grand stories of the cosmos, and looking back at our planet from a position of some physical remove.



Lovelock, for example, famously arrived at the revelatory idea he christened Gaia while consulting for NASA's planetary exploration program in the 1960s. Gaia, he explains, arose—naturally, Tyson might say—from a detached, extraterrestrial perspective on our planet. Life's imprint on Earth was rendered legible only by noting the signs of its *absence* on other planets. Lovelock describes this discovery of Earth with romantic flourish, portraying NASA scientists as dashinglly delivering our planet from a dull wallflower existence:

When the Earth was first seen from outside and compared as a whole planet with its lifeless partners Mars and Venus, it was impossible to ignore the sense that the Earth was a strange and beautiful anomaly.

And yet, he continues, “this unconventional planet probably would have been kept in the scullery, like Cinderella, had not NASA in the role of Prince offered a rescue by way of the planetary exploration program.” Looking to other planets for signs of life—notably Mars—Lovelock realized that a planet with life presented a particular “biosignature,” a certain chemical composition in its atmosphere. Living systems, he reasoned, tend to drive their environments into chemical or physical disequilibrium, while lifeless planets display equilibrium. Turning back toward this ravishing Earth with his newfound planetary sensibilities, Lovelock realized that life was no mere passive entity; life *maintains* the conditions necessary for it to continue. Earth stood out from her neighbors as a self-organizing, self-regulating, tightly coupled system. Earth is alive! An integrated *organism*. The novelist William Golding suggested to Lovelock that a living entity deserves a name, and Gaia, for the Greek Earth goddess, was the name chosen.

Apprehending unity in its reality, then, requires technological and scientific breakthroughs, as well as a certain air of detachment. But the insights that follow often have a religious quality. This applies more or less equally, I would suggest, to synthetic projects in biology, to universe stories and evolutionary epics, and to holistic perspectives on



Earth as a planet. Gaia theory, in turn, fed into the development of Earth System science, which similarly takes the Earth viewed from space as a point of departure (though it should be noted, scholars disagree on the exact relationship and degree of overlap between Gaia and ESS). Given its pedigree, we might discern a mythic origin story for Earth System science, as the offspring of quasi-mystical Gaia; or to use a different metaphor, ESS is the scientifically respectable counterpoint to Gaia, its romantic companion. Befitting his eccentric and contrarian proclivities, Lovelock by turns both encouraged and eschewed Gaia's religious connotations, but in the popular imagination, and among some scholars of religion, the Gaian vision of a vitalistic, interdependent Earth-organism took hold.

Lovelock, and his collaborator Lynn Margulis, were not the first to conceive of Earth in organismic terms. Lovelock himself acknowledges the nineteenth-century Scottish geologist James Hutton as a forerunner to Gaian thinking. Hutton recognized Earth as a "superorganism," and was an early pioneer of systems thinking. Another early proponent of Gaian/systems theory was the Russian cosmist Vladimir Vernadsky (1863-1945) who developed the concept of the biosphere and conceived of Earth's biogeochemistry as a unity. Lovelock became familiar with Vernadsky's work only after formulating his Gaia hypothesis. But Vernadsky's planetary vision inspired and fused with a form of spirituality seen in numerous cosmic thinkers for whom unity is a leitmotif, notably the followers of the French paleontologist and priest Teilhard de Chardin who held that in the fullness of time "everything that rises must converge." That is, in the evolution of the cosmos, increasing complexity and levels of consciousness lead ultimately to greater unity at an even higher level, Teilhard believed, and his vision launched the aforementioned cosmo-mystic narrative of the universe story in which the human stands as the culmination of a drive toward complexity and consciousness that is built into the universe from its very origin.

Suffice it to say there is no dearth of spiritual inspiration coursing through all manner of systems and synthetic thinking about Earth and

the cosmos. But we needn't look only to the roots of ESS to see this. The establishment of Earth System science spawned new (or perhaps not so new) forms of "Anthropocene" mythmaking and renewed calls for—and vigorous critiques of—unity.

In addition to the influence of Gaian theory, the emergence of ESS was effected by a series of scientific and technological developments from the 1970s to the 1990s. The list commonly includes the advent of biophysical modeling of Earth's biosphere and insights gleaned from ice-core drilling in the 1980s; the establishment of the International Geosphere-Biosphere Program in 1983-6; and the creation of the Intergovernmental Panel on Climate change in 1988. To these factors that strongly shaped the emergence ESS and its holistic vision, some add the impact of photos of Earth taken from space during the Apollo space missions in the late 1960s and early '70s.

The integrated Earth system that science discovered, first through Gaia and later in the establishment of ESS, is not merely a striking new perspective on a familiar old object. It yields something entirely novel, and previously invisible: Gaia named a new entity, a whole new biological object, comprised not of life as we knew it but Life with a capital *L*. Earth not as scullery maid but as Cinderella. In a similar vein, Australian ethicist Clive Hamilton writes that, with the purportedly paradigm-shattering advances of Earth System science in the 1980s and '90s, a "new object has appeared," not merely the further articulation of a pre-existing object.

The new object brings an ontological shift. "The focus of interest shifted due to the appearance of a new phenomenon ... For this, new concepts were needed," Hamilton argues in *Defiant Earth*. The unity of this newly visible Earth System effectively jettisons divisions and differences among the human species that created the Anthropocene. It restores order and oneness. The Earth system recognizes "humans-in-general" as the central character of our planet's story, over and above humans in their individual and cultural divisions and diversity. From the (off-planet) "viewpoint" of ESS, there is no global North and South,

no color-coded nations, no distinct cultures, races or genders. The Anthropocene, which appears (in Hamilton’s arresting image) as a *rupture* in Earth history is also a rupture “in the history of humans as a whole.” It is a rupture that, paradoxically, restores a sense of human unity.

In short, for some Anthropocene commentators, the appearance of this new Earth object carries a newfound wisdom that humans are one. And yet, the insight itself scarcely seems new. Humanist scholars tend to revel in diversity and multiplicity rather than oneness. Against objections voiced by such scholars, that positing an aggregate human species glosses over differential responsibility for the myriad planetary damages filed under the Anthropocene label, some, like Hamilton, respond by doubling down on an “undifferentiated Anthropos.”

Oneness of planet Earth is further mirrored in the interdisciplinary nature of the research that springs up to meet and map this new entity. But often, as with previous calls for unified, integrated knowledge, the sciences tend to hold sway, setting the terms for the stories and meanings that emerge. The Anthropocene, after all *belongs*, to Earth System science, as Clive Hamilton insists, for it is only through ESS that the Anthropocene rupture came to be “seen” at all. Other disciplines may gain entry only by first assenting to science. A new narrative appropriate to the novel situation in which we find ourselves, namely, that a single species has acquired the power to alter irrevocably the all-powerful Earth System itself, is necessarily one that embraces the *fact* of anthropocentrism. That is, the Anthropocene reveals (but stops short of prescribing) that humans *are* the dominant creature—so dominant, in fact, “that we have shifted the geological arc of the planet,” Hamilton argues. Like it or not, we are central to the Earth System.

As with previous grand narratives, the new narrative grounded in the demonstrable “fact” of anthropocentrism might take the form of an origin story, a new myth. Thus, Hamilton proposes a new human-Earth story with a new main character: a “shackled super-agent” whose

accumulated, world-making powers have nevertheless run up against non-negotiable planetary limits imposed by an increasingly implacable and recalcitrant Earth. Rendered as a new “Enlightenment fable,” the story hints at a certain directionality in human history and the human-Earth relationship, a slightly diluted form of teleology that marks a (slight) departure from optimistic Enlightenment *guarantees* of progress and unfettered autonomy and freedom. “Destiny withdrew,” the myth explains, “so that men and women could chart their own course on Earth.” We now must carry on as if there were no God, making our own destiny. Yet destiny’s now-hidden hand can still be detected by those properly attuned to the signs present in the “stunning facts of the Anthropocene.” Our larger role and purpose are discoverable not through numinous experience but in “worldly observation and understanding, discernible in the movement of human and Earth history.” In short, our collective purpose is discoverable through Earth System science. If for thinkers like Wilson, a complete account of the human is attained through a thorough understanding of the brain as the final puzzle piece, here, on our newly defiant Earth, it is the Anthropocene itself that finally affords us a “clear view of what humans truly are.”

The Earth System, in this new fable, appears to occupy the place left open by destiny’s withdrawal and the death of God. This interpretation is strengthened by noting the interchangeability of the Earth system with Gaia in Hamilton’s prose. That is, the Earth system is akin to a *deity*. Despite his disclaimer that there is nothing numinous or spiritual about humankind’s realization of its (veiled) destiny, the Earth System is repeatedly personified, given agency, as an angry giant whose sleep we have foolishly disturbed, a volatile mother who embraces her children only to crush them. Gaia is no messiah. Where once we could believe and trust in God, now we can only cower in fear of Gaia. Our mission (impossible) is one of “reconciliation” with this defiant Earth. The path toward this unlikely *détente* is paved by our revelatory understanding of the planet’s interconnected functioning and an “appeal to a kind of universal reason” found in the logic of the Earth System itself. Practitioners of other (non-Earth System science)

disciplines can only gain legitimate entry into negotiations with this rogue planet if they first absorb and ratify the findings of ESS. “No appeal to cultural perspectives”—none of those local, relative, embodied, or contextual forms of knowledge—can sidestep the “blunt truth” of Earth System science and its accompanying story of humanity as a whole.

At this point in our journey through calls for unity and oneness, from sociobiology to Earth System science, we might begin to wonder whether unificatory projects skew (occasionally? invariably?) toward domination by the sciences—perhaps even toward *scientism*—and whether unity might not always carry with it a more than a whiff of anthropocentrism. To reframe, and perhaps oversimplify, the question: does belief in oneness somehow lead us ineluctably back to these persistent *isms*? And if so, why?

Some readers might immediately object that a figure like Wilson can hardly be charged with anthropocentrism, given his earnest petition to set aside for habitat preservation no less than *half* of the Earth, as a bulwark against species extinction. And yet evolutionary epics are distinctly human dramas: Wilson anointed the human mind as the “hero” of the evolutionary epic he envisioned, and he considered the products of the mind—science—to be the most wondrous contrivance of the universe. One could go further, noting that his quest for unified knowledge left him open to charges of various “isms” beyond anthropocentrism and scientism: androcentrism, Eurocentrism, racism, and “other sins made official” (as Wilson himself once put it) “by the hissing suffix.” Wilson’s lifelong penchant for “biologizing” as seen across projects like *Sociobiology*, *On Human Nature*, *Consilience* contributed to a false dichotomy between nature and nurture, and thus an inordinate emphasis on biological mechanisms, genetic explanations, over against environmental factors and societal context. These forms of analysis may perpetuate what some have called the “myth of a default human” whereby white populations serve as the standard and reference point for everyone else, and attendant failures to

address (for example) public health outcomes among people of color as a function of structural racism.

All these considerations lead us, finally, to confront the question head on: What exactly is wrong with unity and oneness? In *Pantheologies*, Mary-Jane Rubenstein reflects on the virtues and vices of various forms of pluralism and monism (i.e. oneness). Within this context she considers two distinct definitions of what has been labeled, and often

reviled as, pantheism. One type of pantheism identifies God with the world; another assimilates all things into a single, divine unity. Rubenstein opts for the first definition (also labeled immanence) over the second “unitive” definition (labeled monism) because the latter “tends to locate its oneness either in a disembodied realm of otherworldly ‘essence’ or in a this-worldly monism that forces all beings into a static ontic hierarchy of race and species.” As ecofeminist theologians have noted, for example, the monotheistic creator God—a male deity—relates to (or rules over) the cosmos in a manner that is reproduced in various dominating Western dualisms: the subjugation of women to men, of slaves to masters, of animals to humans, and of the Earth to humanity as a whole. If we hope to disrupt and dismantle violent hierarchies in Western metaphysics, unity is not a great disruptor. Moreover, the assembling of all things into the One, Rubenstein notes, often assumes a progressive, directional force, “marshaling evolutionary theory to produce a strikingly familiar Great Chain of Being.” This, I would argue, is precisely what we find in evolutionary epics and stories of the universe. In particular, what is “strikingly familiar” about this progressive, unitive assemblage is its reaffirmation of European male humans—the default human—as the apex of creative cosmic forces. These stories end up where they began—with Euro-androcentric universalism running roughshod over proliferating multiplicities and pluralities, over all those who would deny transcendent, absolute truths, in favor of local, relative, embodied, or contextual forms of knowledge.

Elsewhere, Rubenstein reflects on the peculiar impulse to instill a global sense of oneness, to evoke an attachment to Earth, through extraplanetary, “otherworldly,” perspectives on it, such as the Apollo images of Earth from space. Apollonian unity, she argues, achieves its visions by dispensing with all distinctions in race, gender, class, and religion “assembling them all into an undifferentiated, false male universal.” We see this homogenizing move in Anthropocene narratives that double down on an undifferentiated humanity, as I have argued. But more to the point, as Rubenstein observes, “we” have now been witnessing images of Earth’s oneness, contemplating its unbearable wholeness of being, for half a century!

We have not managed to realize The Dream. On the contrary, repeat viewings of Whole Earth seem merely to revive the colonial impulse and “imperial imaginings,” deceptively disguised as peace, harmony, interconnectedness and unity. Fifty years later, here we are, watching the most *non*-representative representatives of the human species—Elon Musk, Jeff Bezos, Richard Branson—dream up new ways to appropriate and plunder the final frontier while the home planet enters its human-induced death throes (conveniently lending greater urgency to otherworldly endeavors).

Should we at long last, then, pronounce unity dead? If so, is the alternative endless pluralism, dizzying multiplicities, a ceaseless stream of local, relative, embodied, contextual, perspectival ways of knowing and being? Given that our most pressing problems do indeed appear to be of a planetary scale and nature, it’s worth considering whether we might salvage some account of human agency and purpose that takes seriously our common predicament and fate. But who is authorized to document, and narrate, our present predicament—is it science alone? (or, more narrowly, Earth System science?)

Presently, there are a number of talented scholars working on some version of these questions. Indeed, in response to the increasing ubiquity of the Anthropocene framework, both in the academy and in the popular imagination, many humanist and social science scholars



have sprung into action in recent years, attempting to chip away (or in some cases, shore up) the Anthropocene edifice and its all-encompassing “we.” But the storytelling options available to us in the Anthropocene are not without limit. “Reality,” as historian Julia Adeney Thomas argues, “does not dictate the stories we tell ourselves,” but it may well narrow the field of candidates. We need stories that are responsive to the dire planetary *constraints* identified by Earth System scientists. It may be that “anything goes” was a Holocene mantra, suitable perhaps to the stable Earth System of that pleasant bygone epoch, but incompatible with the radically altered planet that has come into view. The point about constraints, it should be stressed, is central to the “Enlightenment Fable,” as well: human agency is “shackled”—radically constrained—by the realities of Anthropocene science. Humans have acquired Earth-altering powers, even to the point of inciting a rupture in the Earth System; but Earth too has become more powerful, and more recalcitrant. Whether or not we affirm a characterization of the human-Earth relationship as an epic showdown, the argument for the reality of constraints has merit, I believe.

Leaving to one side Anthropocene counter-narratives of *anything goes* (in Thomas’s typology, stories that simply set Earth System science aside and playfully choose their own adventure), two other options warrant further scrutiny. One is the “Singular Story,” some examples of which I have canvassed throughout this essay: universe stories, big histories, evolutionary epics that track the human species and the human-Earth relationship through deep time. “Proponents of the ‘Singular Story,’” Thomas correctly observes, call for a “merger of disciplinary perspectives and a unity of knowledge,” sometimes seeking “intense synthesis.” But as I have argued here and elsewhere, these syntheses rarely treat the nonscience disciplines as equal partners. Can they even do so, if the constraints of the Earth System (appropriately) circumscribe the storylines that emerge? At the moment, I have no satisfactory answer to this question, but I agree wholeheartedly with Thomas that if the goal of Anthropocene storytelling is to avoid the worst of all possible Earth System scenarios, we do ourselves a disservice by limiting our narrative options to unity

of knowledge, a “single protagonist [or villain!], and an integrated narrative synthesizing all disciplinary perspectives.”

This leaves at least one other storytelling option, what Thomas calls a “Democracy of Voices.” Like the Singular Story, this type of narrative takes science and planetary constraints seriously. It recognizes the “epic” nature of the challenge but responds with “a thousand experimental parables” rather than a cohesive story of species oneness. This approach understands that not all stories need align themselves

with the global story. Not everyone everywhere has equally contributed to destabilizing the Earth System. Not every culture has feverishly pursued the accumulation of wealth at the expense of all that is otherwise good, socially or ecologically. Some have enshrined simplicity and frugality, and continue to do so today. Business-as-usual-approaches that have destabilized the planet may be widespread, but they are not universal. Growing vegetables in your yard (a practice that was the norm not so long ago) or planting milkweed to help arrest the downward spiral of monarch butterflies won’t promptly restore Holocene stability to the Earth System. But these actions create pockets of regeneration and resilience—and hope—that may buffer, if ever so slightly, some of the worst effects of what’s coming.

Local, smaller scale efforts and the stories told about them, are not disconnected from large-scale planetary objectives, even if they are not inspired by the Singular Story. Working at this local level, I would argue, we more readily perceive and engage with the agency of nonhuman organisms whose own world-making powers tend to get lost in the zoomed-out, scaled-up Earth System perspective. These engagements serve to remind us that agency takes many shapes and forms, some of them nonhuman. The task before us is to find and tell stories that do justice to agency in its multiple and multiscalar expressions, from the local and embodied, up to the global and systemic.

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## END NOTES

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<sup>i</sup> “Neil deGrasse Tyson Explains the History of Earth Day,” StarTalk, April 20, 2021 <https://www.youtube.com/watch?v=pWhheyKOgCw>

<sup>ii</sup> Vassiliki Betty Smocovitis, *Unifying Biology: The Evolutionary Synthesis and Evolutionary Biology*. Princeton, N.J.: Princeton University Press, 1996.