

Lisa Sideris's Consecrating Science

with Holmes Rolston, III, "Lame Science? Blind Religion?"; Sarah E. Fredericks, "Reacting to Consecrating Science: What Might Amateurs Do?"; Donovan O. Schaefer, "Mere Science: Mapping the Land Bridge between Emotion, Politics, and Ethics"; Courtney O'Dell-Chaib, "The Shape of This Wonder? Consecrated Science and New Cosmology Affects"; Colin McGuigan, "Wonder Opens the Heart: Pope Francis and Lisa Sideris on Nature, Encounter, and Wonder"; Mary Evelyn Tucker, "Journey of the Universe: Weaving Science with the Humanities"; and Lisa H. Sideris, "Wonder Sustained: A Reply to Critics."

WONDER SUSTAINED: A REPLY TO CRITICS

by Lisa H. Sideris

Abstract. A set of science-inspired cosmic narratives referred to as the Epic of Evolution and the Universe Story or, collectively, the new cosmology, proposes to bring humans closer to nature by placing us into the broader narrative of the cosmos. This article responds to commentary and critique on my book *Consecrating Science: Wonder, Knowledge, and the Natural World*, which critically examines these science-based cosmic narratives and their particular and problematic modes and objects of wonder. Themes include the relationship of wonder to science and ethical engagement; the question of whether wonder, grounded in everyday sensory experience, can scale up to the level of global environmental problems; the relevance of wonder to nonideal environments and negative affects like fear or grief; and the importance of humanistic and religious studies scholarship for critiquing grand narratives of science, among other themes. I also respond to claims that my book misdiagnoses and distorts the work of the new cosmology and its claims to wonder.

Keywords: consecrating science; humanities; new cosmology; Universe Story; wonder

I am honored to have such an impressive group of scholars discussing and dissecting my arguments in *Consecrating Science*. There is something a little terrifying about glimpsing, in retrospect, the various paths one could have taken in one's work but, for whatever reason, did not. Some of the responses to my book point me in fruitful directions I had scarcely considered, but that might have enriched—or might yet enrich—my work on these topics. A number of overlapping themes emerges in these responses, and in my

Lisa H. Sideris is Professor in the Department of Religious Studies, Indiana University, Bloomington, IN, USA; e-mail: lsideris@indiana.edu.

efforts to address them. These include reflections on the participation of elites and experts versus amateurs and laypeople in projects like the new cosmology that engage with science for the sake of producing particular moral and social ends. Some of the responses raise questions regarding how and whether to “scale up” our ethics and affects, as well as our science, in order to address broader global contexts and crises. They press me to think more deeply about how a disposition such as wonder might actually engender ethical engagement with the natural world, and how we can even know that this engagement is taking place. Other responses painstakingly document all that appears to be missing from my book, or its source materials, even ferreting out minor typographical errors, in ways that seem aimed at exposing or chastising me. Of course, anyone who produces a lengthy indictment of a large segment of their field, as I have done in this book, can expect a bit of chastisement, or worse. In responding to this mix of reactions, I am tasked with sorting through these claims and characterizations of my work with as much honest self-reflection as I can muster, in order to discern what is valid and useful, in both the critiques and the elaborations.

WHAT, IF ANYTHING, IS THE NEW COSMOLOGY?

This is not the first time that the central arguments of *Consecrating Science* have been subjected to systematic critical scrutiny by scholars in relevant fields, and I may have to repeat a few clarifications here that I have offered elsewhere (Sideris 2015a). Two points in particular bear repeating at the outset because they speak to certain recurring and overarching critiques of my work that emerge, in one form or another, in this forum. The first entails a closer look at the cluster of projects I collectively refer to as the new cosmology and the issue of whether or not these projects form some sort of cohesive object of inquiry, rather than a straw-man fabrication that allows me to tar diverse projects with the same lazy brushstroke. The second has to do with clarifying the precise nature of my concern about the way in which science functions, or ought to function, in relation to wonder at the natural world.

Sarah Fredericks has made addressing the first point somewhat redundant, owing to her accurate summary of how I compare *and contrast* projects labeled the new cosmology. As Fredericks correctly notes, and as my book makes clear, my claim is not that the various initiatives I call the new cosmology are indistinguishable from one another. Rather, they exhibit, as Fredericks says, “different sources, rhetoric, and aims,” even while they share a general dedication to locating and disseminating a coherent science-based account of who we are as humans, where we came from, and how we ought to live in relation to Earth. As I see it, there are two broad sets of movements within the new cosmology. One, frequently referred

to as the Epic of Evolution, generally takes its bearings, as we might expect, from evolutionary biology. Its proponents are often drawn to various dogmatic naturalisms such as E. O. Wilson's agenda of "consilience" that aims to unite all knowledge under the banner of evolution, or Richard Dawkins's gene-centered view of life and its peculiar scientific enchantments. A second class of Universe Story narratives looks to knowledge of the cosmos, with a particular investment in the idea that Big Bang cosmology reveals a "storied" universe—that is, a universe that has unfolded since its inception in ways that lend a narrative quality to the cosmos, and a purposive structure to reality. Whatever label they use, all of these narratives are deeply attracted to grand synthesizing and a "tormenting desire for unity" (Smocovitis 1999). Indeed, as I note in *Consecrating Science*, there is nothing particularly "new" about these supposedly new stories. Rather, they resemble efforts to synthesize science into a grand narrative—"epic science"—that has much older roots (Eger 2006; Hesketh 2015).

Ambitious synthesizing of this sort might be accomplished by means of a commitment to reductive methodologies or by way of an expansive gesture that takes the whole of the cosmos as the relevant unit or reference point. E. O. Wilson, Loyal Rue, or Richard Dawkins, for example, might (variously) insist that life is explicable with reference to categories of genes, epigenetic rules, adaptation and reproductive fitness, neural modules, and so on. These "reductionists" may even celebrate what they construe as the meaninglessness of the cosmos, often lauding thinkers (like themselves) who have the requisite unflinching courage to confront cosmic nihilism (even while science itself clearly functions religiously for them, as a source of ultimate reality, meaning, and wonder). Another type of grand synthesizer—say, Mary Evelyn Tucker, Brian Swimme, or Pierre Teilhard de Chardin—might look to the largest possible scale for meaning, locating within the cosmos (or imputing *to* it) broad overarching tendencies and macrocosmic patterns by which to interpret the microcosm. The latter approach cannot be called reductive (or "mechanistic" or "materialist"—other bogeyman terms), in the sense of reducing higher order, complex phenomena to lower level material foundations and processes. Indeed, one might say that universe stories work the opposite way, extrapolating from large-scale principles and processes assumed to inhere in the universe itself—complexity-consciousness, universal impulses toward bonding, relationality, and creativity—in order to knit together and give meaning to all other scales within the cosmic order. While these two general approaches may not accurately describe all forms of scientific mythmaking and synthesizing that I examine in *Consecrating Science*, one thing seems clear: Universe Story mythmakers, unlike their biology-smitten counterparts, are not reductionists.

It seems important to clarify this at the outset because Tucker expends a fair bit of energy in this forum and elsewhere (Tucker 2015) defending

Journey of the Universe against charges of reductionism that I have not lodged against it. For example, Tucker admonishes me for neglecting a particular Thomas Berry text that, as she sees it, testifies to “how far beyond reductionistic science he went.” In fact, however, the terms “reductionist” or “reductionism” do not appear in my analysis of universe stories, except—significantly—in two instances where I take care to characterize Thomas Berry as “wary of the analytical reductionism” seen among biologically based mythmakers (Sideris 2017, 85), and when I note that charges of reductionism “do not apply across the board to proponents of the new cosmology” (Sideris 2017, 181). These careful qualifications, and others, are ignored by Tucker’s insistence that “All of the figures in [*Consecrating Science*] are virtually placed under this large umbrella of reductionism and privileging science and then summarily dismissed.” It may be that I dismiss them, but I do not do so summarily (the tendency, I am afraid, is rather toward long-winded, tedious exposition), and not on grounds of pervasive reductionism.

THE RELATIONSHIP OF SCIENCE TO WONDER FOR NATURE: WONDER AS COMPATIBILISM

Of course, one may engage in “privileging science” without adhering to reductionism, and universe stories do indeed privilege science. This brings me to my second point of clarification, regarding my concerns about the way in which science is positioned vis-à-vis wonder and nature in these narratives. To say that science is privileged in a particular worldview assumes that it is given special status over *something else*. That something else, on my account, is nature. The question that my book, and this forum, invites us to consider is: what is the proper configuration among three key categories: science, wonder, and nature (or “the environment”)? “Religion” is also bouncing around this triad, of course. By “proper” configuration, I mean *moral, ethical, salutary, desirable*, and, more specifically, moral, ethical, salutary, and desirable in terms of potential impacts on the natural world and environmental issues. My claim is not that science and the knowledge it produces cannot and should not ever be an object of wonder, but that it should not function as the *ultimate* object of wonder. The positioning of science as ultimately wondrous makes nature (and indeed, religion, and the humanities) into a vehicle for wondering at science, rather than using science—judiciously and with awareness that it is a flawed but valuable human tool—as one way (not *the* way) of enhancing wonder and concern for nature. This means that science retains authority in diagnosing environmental problems—for example, how we *know* the climate is changing—but in and of itself, it cannot tell us why we should care or how we should then live in relation to nature. My efforts to sketch out a “compatibilist” form of wonder, in which “a wondering response

endures in the presence of scientific interrogation,” and is compatible with “scientific understanding or interrogation” (Sideris 2017, 175), and entails “tempered enthusiasm for science” (175), speaks directly to some critics’ concerns about and characterizations of my work. It is inaccurate, for example, to ascribe to me a “false dichotomy” between sensory-based and science-based wonder (Tucker 2019).

Holmes Rolston, who shares my concerns about scientism, nevertheless warns of a crippling blindness that ensues when we turn away from scientific teachings about cosmogenesis and our own planet. But I do not claim that we can safely ignore science. My concern is, rather, that wonder at science stakes a claim to a particular version of reality in which the natural world as we know and experience it may or may not participate. Excessive wondering at science—what I call consecrating science—may even interfere with our ability to care for and connect with the natural world (I say it *may* do so, and I suspect it does; I take up empirical questions, as raised by Fredericks, a bit later). It is the *superlative* claim, the insistence that science is most real, that science’s forms and objects of wonder are better—purer, more powerful—than all others, that I question. Otherwise, I see nothing in Rolston’s account of the wonders of science that runs counter to my compatibilist perspective. But I also see little that would draw me closer to the natural world as I know it and fear for it.

Regarding superlative claims on science’s behalf: Rolston argues that “science enables us to appreciate the universe and the world we live in *vastly more* than common personal experience, *vastly more* than humanists, prophets, or religious sages.” These claims for “vastly more” hold true, it seems to me, only if terms like the universe or the world are taken in a very literal and physical sense. If I want to “appreciate” the universe in terms of having an explanation for the origin, composition, or material processes of planets, stars, galaxies, and so on, then, yes, it would behoove me to open a science textbook rather than a novel—or the Bible. If I want to know how to create or engineer a planet, I should acquaint myself with concepts like gravity and electromagnetism, and strong and weak nuclear forces, among other things. But it is not obvious what Rolston’s canvassing of picometers and light years, of binding natural forces, has to do with a moral response to the various, and very serious, environmental crises in which we find ourselves. (Not obvious, that is, unless my response to these crises *is* to engineer the planet, or create a new one.) “We measure time at ranges across 34 orders of magnitude, from attoseconds to the billions-of-years age of the universe,” Rolston insists. But who is “we”? Who measures time in this way? Reader, do you? I had to Google “attoseconds.” Must I learn to measure time in this way in order to inhabit a “science-based worldview,” and to “know what is *really* taking place”? (Rolston 2019, my emphasis). Frankly, I would be concerned about a person who habitually

inhabits these timeframes and magnitudes, for how could such a person feel invested in things that matter on a human scale?

It is not that these teachings of science are devoid of wonder of a certain gee-whiz sort. But the wonder they evoke has little obvious relevance for cultivating environmental sensibilities—and that, after all, is what the new cosmology claims to do. In the midst of all this dizzying talk of orders of magnitude and billions of years, Rolston affirms humans as the “genius on top,” the “wonder of wonders.” Human minds are “by far the most complex thing known.” All that magnificent grandeur, the vastness and strangeness of the universe, now suddenly collapses and turns in on itself, in this one solipsistic article of faith, this singularly earnest and self-fulfilling prophecy: *we know we are the most complex thing known.*

Against the backdrop of such cosmic certainty about all that we know, and assurances that we can know that we are the most amazing thing known (call it, as Tucker does, *anthropocosmism*), my own account of wonder might appear an extreme and even dangerous breed of mystery-mongering. Among his many excellent provocations, Donovan Schaefer raises concerns about the political risks of wonder understood as “the limitless questing after the ground of Being” and its attendant skepticism “that science can ever deliver any kind of meaningful claim.” Schaefer associates these sentiments with the Heideggerian tradition that he detects as “humming in the background” of my defense of wonder. But wonder as I develop it in *Consecrating Science* is not drafted in the wake of Heidegger, or other figures Schaefer cites, such as Eliade (who is, however, influential in the work of Berry and Tucker). My compatibilist account of wonder has a clear pedigree. It is indebted to a collection of diverse thinkers identified in Colin McGuigan’s careful overview of my conversation partners: principally, Rachel Carson, Sam Keen, Loren Eiseley, and (perhaps above all) the brilliant R. W. Hepburn. It is further enriched with occasional insights from Martin Buber or Gabriel Marcel, among others. I cannot say whether and to what extent these figures had any truck with Heideggerian thought (Carson, I am fairly certain, did not; Marcel likely did). But, regardless, the wonder I endorse would never doubt that science can make any meaningful claims. Rather, in the spirit of the late, great Mary Midgley, it challenges science that appoints itself the sole or most authoritative arbiter of meaning. It honors what, following Keen, I call “creative scientists” for whom (quoting Keen) “all the abstractions and explanations which arise out of the desire to understand and control the world do not prevent a return to the object in a spirit of wonder” (Keen 1973, 33–34). As a course correction to overweening scientific hubris, these proposals on behalf of wonder are fairly modest, not the sort of sentiments likely to give rise to fascism.

EVERYDAY EXPERIENCE AND THE PROBLEM OF SCALE

Of course, it will not do simply to insist that Heidegger is not among my playmates, or that phrases like “ground of Being” do not come naturally to me. Schaefer is raising a broader issue, namely, the relationship between wonder and ethics, which is central to my project as well as those I critique. Schaefer’s challenge here takes a few different forms, not all of which I can address in this space. He worries, for example, that even if wonder yields a moral relationship, it may, particularly in its sensory form, lead us to care principally for what is right in front of us, while neglecting large-scale global issues (McGuigan raises another version of this concern, in the context of contrasting my account of wonder with Pope Francis’s sometimes global vision). Schaefer references a grim joke among animal advocates that depicts them as lavishing affection on nearby snuggly creatures, while ignoring the horrors of the out-of-sight factory farm. My concern with the new cosmology is, of course, the opposite: that its global or cosmic orientation interferes with connecting with what is immediately before you. On an analogy with Schaefer’s grim joke, my concern would be that animal advocates inspired by the new cosmology would love not the snuggly creature on the couch but instead something like photos of taxonomic types to which are attached scientific labels: *Felis catus*. These narratives seem poised to displace, in our hearts and in our ethics, what is near at hand and sensible with what is abstract, beyond, and universal.

It is hard to see much danger in bonding with what is close at hand, in a world where staying put and connecting with local environments is increasingly threatened by (so-called) cosmopolitan lifestyles and the displacement of immediate (unmediated) encounters with technology or virtual reality—at least in the global North. But what Schaefer and, in a different way, McGuigan, are really pressing on is the issue of *scale*. “The challenges that face us now are not human-scale challenges,” Schaefer insists. Can sensory-based wonder generate moral responses to problems that increasingly manifest as global and abstract? Here, of course, the elephant in the room is climate change.

To respond to these challenges, I need to step back and consider some of Schaefer’s other points. He worries that my democratizing move away from expert knowledge as a crutch for wonder might lend credibility to the know-nothingness of the Donald Trumps and Scott Pruitts of the world—as with Trump’s spurious recourse to his gut feelings, his instinct for science that absolves him of any need to consult climate experts, or any experts. However, my account calls not for the democratization of science but, if you will, the democratization of wonder. Scientists must act as experts in informing us about science. But they, and the mythmakers who applaud them, have no business telling us that the wonder *they* feel at the scientific enterprise is supremely real or valuable. Remember, my project is *not* about

undercutting the value of scientific information and expertise per se. Let me repeat, lest I be caricatured as a climate change denier: scientists are qualified to speak with authority on matters such as climate change. But even granting this, certain problems and questions remain. For example: Does this scientific information itself actually motivate people to care and act? If the answer is some variety of “no” (and there are reasons to think it is), then we might ask whether a human-level, sensory experience of wonder might fill in some of the motivational gaps.

These are extremely complex questions, and they are tangled up with a whole host of other vexing issues, such as whether people are more likely to respond to hope than fear, good news or bad news, and whether specific, physical threats are more compelling than slow-moving existential ones. Decades of research points to the human tendency to discount the future, to value short-term gains over longer-term, remote benefits. Moreover, according to what is called construal level theory, climate change poses a problem of psychological distance, whereby “people conceptualize things that are psychologically distant from them (in time, space, or social distance) more abstractly than things that are psychologically close” (Markman 2018, n.p.). Psychological distance may be effectively bridged by various strategies such as risk communication. But the bottom line is that there are good reasons to believe that the very abstract and seemingly global nature of climate change contributes to a lack of response. We can “listen to” planetary-scale science that is “highly abstract, highly detached” from our daily, sensory experience all day long, as Schaefer urges us to do, but the results may still be disappointing.

It is worth noting, however, that scientists themselves have likely contributed to this lack of response, in consistently presenting climate change as, to use Schaefer’s terms, a macrolevel catastrophe that is “impossible to see” without sophisticated scientific instruments or training. Scientists’ claim that climate change is inherently undetectable has been overstated, and often accompanies other claims about the inherently global nature of climate change (Hulme 2010). In their commitment to cordoning off weather from climate, scientists have carefully restricted themselves to language about climate change increasing the chances of certain types of events, such as hurricanes. It is understandable that scientists invoke this distinction, to avoid scenarios where every time a cold snap ensues, a dimwitted politician tweets that global warming is a sham. But the distinction has not prevented these scenarios and it may have encouraged other problems. However well-intentioned, scientists’ measured approach encourages a gulf “between brute, visible reality and climate change”—a gulf that is then filled with “arcane mathematics, high-tech measuring devices, and inhumanly large temporal and spatial scales” (Rudiak-Gould 2013, 121). Scientists have somewhat stubbornly adopted an “invisibilist stance” that treats climate change as “too big, too slow, and too uneven

to be seen” (Rudiak-Gould 2013, 122). This commitment to invisibilism can be seen as part and parcel of an Enlightenment philosophy that treats ordinary human perception as unreliable.

Conveniently, invisibilism, whether of climate change or other abstract phenomena, also flatters scientific expertise, reinforcing the idea that the scientist perceives what the man on the street cannot. So, while it may be, as Schaefer says, that the climate crisis is tailor-made to “slip through the net of liberal common sense,” it is also tailor-made to bolster scientists’ prestige and their own vested interest in maintaining the inaccessibility of their knowledge. After all, scientists and science journalists (let us not forget them) are free to create terms and metaphors that do not run *counter* to lay perceptions (Larson 2011); to disseminate metaphors and analogies that are appropriately motivational or responsible (think of all the damage done by the wildly inaccurate “selfish gene” metaphor, for example). How often have you heard human (non)perceptions of climate change likened to a frog in water slowly being brought to a boil, who is unable to perceive incremental increases in temperature until his fate is sealed?

In fact, however, people *do* experience climate change. Within the past couple of years, climate scientists have even begun to concede that the weather/climate distinction is not ironclad (though they have done so not as a concession to lay perceptions, but owing to improved modeling) (Leifert 2019). Indigenous people, whose communities have traditionally opposed both the assimilating reach of the state and the universalizing tendencies of science, turn out to be remarkably good at “seeing” changes to their climate. Similarly, many anthropologists, unlike climate scientists, are also remarkably comfortable with interpreting local reports of change straightforwardly, as eyewitness of accounts of climate change (Rudiak-Gould 2013, 125). The strong attachment to place seen among indigenous and other “frontline” communities—often working with oral histories that can serve as a kind of local, cross-generational perception—allows them to experience climate change. Perhaps, climate change actually is visible to the “locally trained eye” (Rudiak-Gould 2013, 126). While my own agenda is not to democratize *science*, I see value in the argument that place-based citizens with cultivated sensory perceptions can testify to the reality of climate change, alongside the place-eradicating tendencies of climate science. “Sensory experience on the ground breathes life and urgency into desiccated expert assessments, while scientific generality serves to unite disparate communities around the travelable concept of climate change and methodological skepticism provides a cautionary counterpoint to overexuberant local attribution” (Rudiak-Gould 2013, 129). The senses operate in tandem with the place-based form of wonder and attachment I defend. Working together, scientists and laypeople can help each other to see changes in climate.

AFFECTIVE PAYOFFS AND IDEAL ENVIRONMENTS: THE LIMITS OF WONDER?

Courtney O'Dell-Chaib also raises questions of how everyday and often marginalized people experience their environments. Her work corroborates some of the key claims of *Consecrating Science*, while also pointing, intentionally or not, to some of its vulnerabilities. She builds upon concerns that the new cosmology works its wonder in rarefied realms far beyond embodied, quotidian concerns and experiences. But she does so in novel ways, by attending closely to what it means for wonder to be *deracinated*¹—a term of critique I occasionally use in my book. The wonder of the new cosmology is not just uprooted from the realm of ordinary perception and from wonder's own rich history, O'Dell-Chaib points out. It is rooted out of social contexts of knowledge production and historical experience—particularly, the historical and embodied legacies of environmental injustice. Who exactly is this universal human that forms the heart and mind of the universe? O'Dell-Chaib asks. How does it stand in for, and erase, other human histories and experiences? As she astutely observes, deracinated wonder attaches to “uncritical forms of science” in ways that also establish wonder as “an investment in white environmentalism,” turning us away from “pluralities of encounter and the affective weight of environmental degradation and environmental racism.” Significantly, as she argues, this deracination of wonder absolves the new cosmologists of reckoning with negative affects—grief, trauma, anger, shame, and mourning—by virtue of a singular focus on “ideal environments with particular affective payoffs,” notably, reverence, awe, and wonder. Particular people with particular embodied experiences and histories may or may not experience these positive affects “due to sedimented histories of violence” and other cumulative and ongoing injustices.

In raising these questions about the availability of ideal natural environments and positive affective payoffs for all, O'Dell-Chaib makes it clearer to me (without explicitly aiming her critique in my direction) that my own account of wonder is not nearly democratic enough. I have insisted that wonder may engender or commingle with responses that are not altogether positive. Wonder can be unsettling and disorienting. It may challenge our self-importance and expose our vulnerabilities, for it does not posit humans as the cosmic climax and the genius on top. But I have not contended in my book with nonideal or crisis environments and the negative effects O'Dell-Chaib points us to. This raises a serious question of whether wonder—even wonder fully restored to its own rich and complex roots—remains relevant in the face of devastated environments and toxic bodies, human and otherwise.

In thinking about the toxic and untidy “intimacies” O'Dell-Chaib's work brings to the fore, I am put in mind of Rachel Carson who was no

stranger to crisis. In *Silent Spring* she wrote movingly—and quite angrily—about toxic environments and toxic bodies, all while suffering the ravages of metastasized cancer and an onslaught of side effects from the toxic chemicals prescribed to treat it. In ways that foreshadow the insights of material feminists who describe bodies as permeable and porous to their toxic surroundings (Tuana 2008; Alaimo 2010), Carson envisioned a corporeal ecology that is continuous with the wider ecology, where mysterious chemical agents effect frightening and unseen “alchemistic transformations” in human and animal bodies (Carson 1962, 26). These chemicals have “immense power not merely to poison but to enter into the most vital processes of the body and change them in sinister and often deadly ways,” Carson warns (1962, 16). “If we are going to live so intimately with these chemicals—eating and drinking them, taking them into the very marrow of our bones—we had better know something about their nature and their power” (Carson 1962, 17). The central message of *Silent Spring* was one we hear voiced frequently today. In essence: “If you’re not outraged, you’re not paying attention.” My point is not that Carson holds the answer to everything but that, as I have argued elsewhere (Sideris 2009), her thinking about the natural world plays upon both positive and negative affects—fear, anger, grief, wonder, and reverence—as key ingredients that motivate environmental concern. O’Dell-Chaib allows us to see that attachment to place requires that we navigate the full range of affective responses. She reminds us that not everyone has access to these positive experiences and undamaged environments. But, as I see it, this is not an argument for giving up on wonder and sensory engagement, but reason to work harder to repair such damage, and ensure broader access to experiences in nature, in all its forms. Wonder is no cure-all. The environmental movement needs, and I think has always expressed, both the narrowed and focused perception of fear and the expansive and humbling vision of wonder.

“LAY” RESPONSES TO THE NEW COSMOLOGY

The role and reactions of amateurs and everyday people vis-à-vis experts and elites are themes Sarah Fredericks picks up and develops in impressive ways. Her work goes straight to the heart of questions that are bound to shadow a project like mine, and she even proceeds to model the kind of work that might begin to answer them. Fredericks recommends a methodological turn to documentary analysis that might allow us to test whether or not the new cosmology encourages problematic attitudes and behaviors. She demonstrates this approach by examining online reviews of texts that are central to the mission of the new cosmology. I have to confess that, while I have unavoidably come across reviews of many of these texts from time to time, it never occurred to me to incorporate them into my analysis. My own methodology, insofar as I can claim one, is largely to attend to the

authors' discourse and rhetoric. Inspired by Fredericks's example, I have now done a bit of informal and not very systematic documentary analysis myself using online reviews, the results of which I discuss below.

Fredericks identifies a set of what she takes to be key concerns raised in my book and proceeds to relate these to actual reader responses. Her analysis is complicated by the self-selecting nature of her sample, as she concedes, but it seems plausible to assume that these reviewers "will include some of those most affected by the texts." She notes that the majority of the reviews are positive. This alone tells us nothing about whether or not my concerns are legitimate, since readers may resonate positively with attitudes and values that, on my account, are likely inimical to environmental values (for example, anthropocentrism, hubris, adulation of science and scientists). As Fredericks understands, there is an additional question of whether or not readers are inspired by these texts to engage with nature directly. This is a difficult question to get at through reader reviews, since some readers might be actively engaged environmentalists without ever mentioning their engagement, and others might reference feelings of connection to nature or environmental commitments without actually acting on them (even when they claim they do). To complicate these issues further, I would reiterate a point I make in *Consecrating Science*, that even if avid readers of these texts are engaged nature lovers, we cannot assume that these commitments *spring* from the new cosmology. On the contrary, the new cosmologists themselves often speak of their environmental commitments as having originated elsewhere, as, for example, with impactful firsthand experiences in nature. What they lacked was a functional religion that cohered with these values and experiences (having rejected the existing traditions as dysfunctional for this purpose). The Epic of Evolution or the Universe Story, in other words, provided them with a mythic framework in which preexisting environmental values made sense.

Connie Barlow, for example, explains her approach to putting long-standing green values together with a scientific cosmology. "Values to which I am *predisposed* can be made to emerge from the underlying cosmology" (Barlow 1997, 240, my emphasis). This does not entail that the cosmology *produced* the values. "Underlying" here does not mean prior ontologically (or temporally). It merely signals that a cosmology is understood by these thinkers as something like a device that can be inserted (either in place of a faulty cosmology, or where one is simply missing) to securely anchor one's values and create coherence. As with appeals to unity, synthesis, or consilience, a high premium is placed on coherence among the new cosmologists. Confronted with environmental issues, "I decided that my [Christian] tradition was irrelevant," Loyal Rue explains. "So there was a moral imperative just floating loose—nothing worse than a morality that floats loose" (quoted in Barlow 1997, 71). *Nothing worse*. "I was in search of a cosmology," he continues. Epic science, he eventually realized, could

serve this function: "My moral commitment finally had a foundation. All of a sudden, whoomp! Now it goes down like a taproot" (quoted in Barlow 1997, 71). Users of these texts may approach them in a similar quandary (if it can be called that), namely, with a commitment to nature in search of a functional myth. This is not to deny that the adopted cosmology may help to strengthen one's preexisting green values and commitments. But we cannot therefore assume, as the new cosmologists' rhetoric often does, that a science-based cosmology needs to be universally adopted, or that the new cosmology is the engine that produces such values and actions.

Of course, my own contention is that this cosmology does *not* obviously cohere with environmental values and concerns, that it may glorify science and the human to the detriment of nature. So let us return to Fredericks's analysis. Without recapping her findings, I want to highlight some important points, partly for the sake of adding observations and interpretations of my own. Fredericks finds among these reviews some clear indications that readers feel devotion to the *texts* themselves, approaching them as "sacred" or as "wisdom literature." This is a point about which I express some concerns in my book (noting also the tendency of the new cosmologists to reduce religion to texts and creation stories). She highlights one review that similarly leapt out at me when I perused reviews online: "I finally found my creation story." She also finds readers poring reverently and repeatedly over the texts (or film), sharing them with others, and sometimes encouraging all readers to purchase and share them as well. In keeping with the proselytizing impulse I have identified in the new cosmology, these readers are drawn to "venerate" the texts and "spread the good news." Those who use them in class, as with college professors, often "mentioned the texts in conjunction with encouraging particular ideas without mentioning the need to assess them critically," giving the impression that the texts "are being endorsed in class." We might surmise that these readers (including some instructors) are particularly interested in what the new cosmology offers as a functional religion: a central canon or bible, a creation story; an updated version of Genesis; wisdom to be evangelized, rather than critically engaged.

As with readers who venerate the texts, some reviewers use language that reveres and reifies science and scientists, as well as the charismatic authors of the new cosmology, in ways that may support my concerns about human exceptionalism and tendencies toward scientism. "Indeed," Fredericks writes, "all the new cosmology texts I studied had reviews expressing devotion or awe about the author and science." Similarly, some readers are clearly awed by the *knowledge* contained within the texts, alluding to such knowledge in terms that repeat the claims of the new cosmology to provide a uniquely "real" and "true" story, or what I call a religion of reality. Fredericks also finds many readers expressing awe and wonder at the universe or nature itself, "as well as or instead of science or scientists,"

and some who connect the texts to outdoor settings in some way, perhaps suggesting that an appreciation for nature was indeed sparked or enhanced by the text (again, noting the caveats I offer above). We cannot know how many of these readers gravitate to these sources owing to strong preexisting feelings of wonder at the cosmos (some mention, for example, prior interest in and fondness for Carl Sagan's *Cosmos* series, in keeping with Tucker's contention that people like big cosmic stories). Or consider the example provided by Tucker at the conclusion of her essay, quoted from a student who encountered *Journey* in an online course created by Tucker and John Grim, and who describes herself as a "young person who has always nursed a strong sense of wonder." As Fredericks notes, we are presented with a self-selected sample that includes many readers who likely already hold environmental values and/or feel moved by wonder at science or the universe.

That said, it would be awfully niggling of me to dismiss these apparent expressions of wonder out of hand, simply because those expressing them have come to the texts with some prior investment in environmentalism or have independently acquired their sense of wonder! But we might ask whether these responses (which can be read as fairly modest gains in terms of moving the needle toward planet-saving action and away from human-centric values) warrant hyperbolic claims often made on behalf of the new cosmology as a story that outperforms rival religions and steers humans unerringly into the arms of nature. We can also ask whether and on what grounds the new cosmology, and particularly *Journey of the Universe*, merits the attention it has commanded, notably at major scholarly venues like the American Academy of Religion, where the film is frequently screened and celebrated in ritual fashion. We can inquire whether its influence is a function of the power of its ideas or of some other kind of power—an inquiry that seems germane to O'Dell-Chaib's critiques of the new cosmology in this forum. A variety of rich resources fuel these and other events honoring and promoting the new cosmology, and especially *Journey*, and there are perks for scholars, including young scholars in training, who participate in them uncritically (more on this below).

Various gatherings, in academic and nonacademic settings that celebrate the new cosmology, have produced a tight-knit (and, yes, fairly like-minded) group of scholars, some of whom are as devoted to the project as Tucker herself. In fact, among the online reviews of new cosmology texts analyzed by Fredericks, a surprising number of them are written by scholars who participate in these events. The enthusiastic endorsement of *Journey* cited by Fredericks—"I finally found my creation story"—is from Paul Waldau, a scholar with expertise in religion and animals, who frequently contributes to publications and events organized around the Universe Story. Connie Barlow, a chief evangelist of the evolutionary epic, provides one of the most glowing reviews of Ursula Goodenough's work

cited by Fredericks. Several other reviews of *Journey* on Amazon.com and Goodreads are contributed by scholars whose names I immediately recognize as individuals close to the project. These include Scott Sampson, an evolutionary biologist and paleontologist who has spoken at Tucker's events and contributes to the "Conversations" segment of the companion DVD to *Journey*; Chris Uhl, a biologist whose "testimonial" is emblazoned on the *Journey* website; and Julianne Warren, an ecologist and writer who advocates for *Journey* in her talks and in online forums.² An especially lengthy and enthusiastic review of *Journey* is provided by Sister Helen Pre-jean, the famous nun who wrote *Dead Man Walking*, and who happens to be a fan of Thomas Berry. There are other reviews left by readers who are self-described professors, and the status and identity of many others are simply impossible to ascertain. My point is that these reviews, along with those written by scholar-teachers who may or may not be part of the new cosmology's inner circle, call into question the accuracy of treating these online responses as the work of laypeople, amateurs, nonelites, or nonexperts.

THE WIDER AGENDA OF *JOURNEY OF THE UNIVERSE*?

Having raised questions about why the new cosmology figures so prominently in some circles, I turn now to Tucker's defense of *Journey of the Universe*. Based on her responses to my work, in this forum and elsewhere, Tucker believes that the value and indeed the truth of her project can be demonstrated by pointing to the dedication and prestige of the scholars involved, or through a sheer tally of the numbers of people who have participated in (or purchased) *Journey of the Universe* events and products—books, DVDs, film screenings, enrollment in MOOCs, awards, translation of the text into other languages, and so on. That people might flock by the thousands to these projects does not put my mind at ease, naturally. Nor, and more importantly, does it constitute a refutation of my claims and concerns. Nor, for that matter, does it even constitute evidence of the truth of the project's *own* claims. What it indicates is popularity. In that sense, as I see it, it is grounds for concern. If I doubted that the new cosmology has some traction both within the academy and in the broader world, I would not have written the book.

While I am obviously concerned that these projects embody problematic attitudes and assumptions about nature, science, and the human, these are not my *only* concerns. I also worry, for example, about *what kind of scholarship* this is, and whether, in fact, the activities of the new cosmology constitute scholarship at all. Indeed, Fredericks's insightful work suggests to me that there are two sets of questions we might put to the new cosmology: (1) What are the intentions of those who promote these projects? (Or, what do the creators of these texts want their audiences to

think, feel, and do?) And (2) How are these projects received by audiences, particularly so-called lay people (or, what do these people actually think, feel, and do, in response?) As Fredericks's overview of documentary studies suggests, how people use texts is complicated and may or may not align with what the texts' creators intend. But her work has clarified for me that certain aims and intentions of the new cosmologists, as I read them through their rhetoric and discourses, are troubling in themselves, regardless (to some extent) of how the texts are actually used. To the extent that their audiences *do* resonate with these intentions, I am doubly disturbed.

Let me explain with particular attention to Tucker's rejoinder to my critiques of *Journey of the Universe*. Regarding the first question of what the new cosmologists seek to do, it is safe to say (and I do say in my book) that these thinkers, by and large, are genuinely concerned about the environmental crisis and want to intervene in positive ways. But there is much more to their agenda than that. Ultimately, I believe some of my strongest disagreements with Tucker boil down to questions about the role of the religious studies scholar in the wider academic and nonacademic world. What follows are some examples of what I take to be the agenda of the *Journey of the Universe* project, about which I have concerns.

Tucker insists that "simply because Sideris prefers small stories" does not detract from the demonstrable fact, as she sees it, that millions of people around the world are clamoring for "big stories." Of course, the question is not what kind of stories *I* prefer, nor is it what kind of stories people generally like. It is not about liking stories. Tucker appears to understand her role as a religion scholar to be that of the storyteller tasked with giving the people what they want. If they want big sciency stories that educate,³ entertain, and comfort them, that tell them, on good authority, who they are and what their "role" in the universe should be, then religion scholars ought to oblige. This way of framing what religious studies and, more generally, humanities scholarship aims to achieve is apparent, I think, in a variety of Tucker's statements regarding the content and mission of *Journey*. Tucker's insistence that the masses want big stories, and that *Journey* fits the bill, remains oblivious to the important points raised, for example, in O'Dell-Chaib's work: That these narratives do not, in fact, tell everyone's story. That their image of the human cannot stand in for all people and all experiences. That the knowledge on which *Journey* stands is not timeless truth but is, like all knowledge, culturally produced and constrained and (in *Journey's* case) curated for particular effect (and affect). That it fails, as O'Dell-Chaib says, to recognize its own narrative as a series of *choices*. That *Journey* runs roughshod over the idea that people may agree on certain facts while disagreeing on the meanings drawn from them. *Journey* skips over these steps, presenting its particular "facts" about

the universe as universal moral truths. It makes the audience's choices for them.

Of course, the audience may not be aware of these moves. The discouraging reality (to my mind, at least) is that some readers, perhaps many who come to these texts, seek precisely the sort of certainty and security about their place in the universe that *Journey's* narrative obligingly offers. This brings me to my own analysis of online reviews of *Journey*. I want to comment on a type of response to the book and film that may not be immediately evident in Fredericks's findings. These responses are related to concerns about anthropocentrism or human exceptionalism, but there is more to them than that. What *Journey* offers, and some readers apparently "want," is to know that the universe has a discernible, teleological purpose and that humans can have faith in its ultimate purposiveness. I was particularly struck by comments approving of *Journey's* power to reassure readers of their centrality to the cosmos, to dispel ambiguity about what it means to be human and to short-circuit the searching (and thus, wondering) impulse itself, by providing answers to the largest possible questions.

One reader praises *Journey's* "optimism regarding the future of humanity," and the "likelihood that humans will *discover their purpose* in the universe" because "the universe itself has brought us this far, and can be *trusted*."⁴ "If we are to *make sense of our lives* we need to embrace this story as our own," one reader urges,⁵ while another recommends *Journey* as a book for those wanting to "*understand our role* on earth as human beings."⁶ "A clearer sense of *human destiny*"⁷ is what *Journey* provides, as well as knowledge of "who we humans *really are*; why we (and life) exist."⁸ Some readers wax therapeutic, praising the book for the "genuine enjoyment of scientific achievement" it enables and advising that "if this book doesn't begin to *put things into perspective* for you, you may need to . . . allow the considerations to penetrate your psyche."⁹ Another lauds the narrative for illustrating that "sentient creatures like us" are "an *inevitable consequence* of an evolving cosmos" seeking to understand itself. The reader continues: "What good would the universe be *without creatures like us* to observe it?"¹⁰ Many other comments point to *Journey's* assurances of humans' unique gifts, special role, or destiny in the universe. Even if these reviews present a minority perspective (which is difficult to ascertain), I worry about the kind of complacency that might be engendered by reassurances of the incompleteness of the universe without us, and the wisdom of trusting in cosmic forces.

THE DEVALUATION OF HUMANISTIC INQUIRY

Tucker might well point to reviews like those just cited as proof of her project's worth: people want big answers to their big questions. They

seek affirmation of their special place and role in the cosmos. *Journey of the Universe* supplies this. No harm done (perhaps). But is this religious studies scholarship? Is it science? Is it even wonder? (I think not). If it is not these things, then what is it?

Other clues to Tucker's understanding of the role of the scholar and the aims of humanities scholarship can be found in the way she repeatedly describes *Journey's* mode of blending of "humanistic" insights with science. The inclusion of humanistic approaches is signaled almost exclusively by what Tucker calls "poetry," "metaphor," "symbols," or even "wisdom" in *Journey*. She cites humanists "from philosophy, literature, history, and the history of religions" who correctly understand that *Journey* is "not simply a scientific narrative," as demonstrated by elements like "poetry, metaphor and symbols [that] were woven into the book and film so as to inspire engagement with environmental and social challenges." Understood as the realm of myth, metaphor, and poetry, the humanities *inspire* but they are not licensed to inquire or critique. The project steers clear of humanistic perspectives of the sort marshaled in O'Dell-Chaib's important analysis, perspectives from environmental justice, history and philosophy of science, gender studies and feminist philosophy, science and technology studies, and other humanistic contributions that might temper *Journey's* claims and encourage greater reflection on its forms of knowledge production or its investment in a transcendent human who figures centrally as the knower of the universe. Tucker's account of the humanities as a source of poetry and metaphor accords with the forms of one-sided, faux interdisciplinarity my book critiques. Note, for example, that in defending her project's integration of science and nonscience, she cites approvingly Baird Callicott's claim that nature is "*revealed* by the sciences," and expressed in the "*grammar* of the humanities" (my emphasis). The humanities, on this account, stand ready to translate science, to make it into something more appealing to the public. Interestingly, Tucker uses the same language to account for the ways in which "religion" is imperceptibly woven into *Journey*. The presence of religion can be verified by the sprinkling of "images and metaphors" and "wisdom" throughout the text or film. In other words, this is a project that treats both religion and the humanities primarily as sources of poetic or metaphorical embellishment for science, or a convenient and affective vernacular in which to convey scientific truths. Is this the best the humanities can do?

Note that Tucker concludes her essay by urging academia to rise above work that merely "deconstructs" and "distorts" the constructive work of others (I will come back to "distortion"). But the humanistic task of critically assessing scholarship is vitally important work, particularly when confronted with projects that aim to dispense wisdom and explain humanity's purpose to a potentially vast audience. As I have said before (Sideris 2015b), the new cosmologists find critique distasteful. Tucker rehearses the

“painstaking efforts” of *Journey’s* authors to “involve scholars from many disciplines” and cites numerous conferences and other scholarly gatherings, spanning a decade or more, during which *Journey* was vetted and discussed. But more often than not, these “conferences” are invitation-only affairs that rarely entail an open call for papers or responses of the sort that would encourage open dialogue. I can attest to this not only as someone who has observed these gatherings, often in an ethnographic spirit, but as one of the (12,000) recipients of the Forum on Religion and Ecology newsletter, which functions to a large extent as a promotional flyer for events related to *Journey* or Thomas Berry’s wider legacy. At one such gathering that I attended (the only one to which I was formally invited), a scholar who travels in Universe Story circles quipped privately to the assembled group that he had rewritten his presentation as a “sermon” to suit the occasion. There is nothing wrong or unusual about like-minded scholars drawing together to work on a common project. But events associated with the new cosmology seem unusually insulated from the normal channels of academic inquiry and critique.

Tucker looks askance at “deconstructing” other scholarship, for she regards such engagements as distractions from working toward “the flourishing of our shared planetary life.” In this context, and at a few points throughout her essay, she charges me with willfully distorting her or Berry’s work in some very specific ways that I feel compelled to address. She claims that I attribute to Berry a quote about the self-purifying nature of science “that is not there” in the text I cite.¹¹ It is there. It appears in *Dream of the Earth* on page 18, and it reads just as I have quoted it: “If our science has gone through its difficulties, it has cured itself of its own resources.” She also claims that I falsely attribute to Berry a passage that actually appears in *Journey of the Universe*. Actually, my text (Sideris 2017, 138) correctly cites *Journey* as the source of the quotes and correctly attributes the passages to its coauthors, Swimme and Tucker (“they”) in the main text, and my endnotes provide the correct page number. What Tucker reads as willful distortion amounts to an errant “ibid” in a long list of “ibids” in my endnotes, where the full title of *Journey of the Universe* should be instead. I doubt any reader could be seriously misled as to the source of the quoted material. Next, she defends a naïve appraisal of the benevolence of science that appears in *Journey*, to which my book calls critical attention, by claiming that the remark was intended “ironically.” I admit that, even on a rereading, I failed to detect the irony in this sentence, or in any sentence in *Journey*, which is among the most earnest texts I have ever encountered. Perhaps I lack the sensibilities to detect this brand of irony (I am given to earnestness myself). Above all, Tucker repeatedly chastises me on grounds that my bibliography does not include specific works that she believes cast her project or Berry’s in a more nuanced light. Needless to say, there may be many works an author consults that do not appear in her list of sources, but as it stands,

my bibliography references nine different sources from Berry and fourteen from Tucker herself.

I trust that these comments suffice to clarify the nature and severity of my distortions. But I do want to take up, briefly, Tucker's question regarding why my book does not spend any significant time discussing her well-known engagement with world religions and ecology, notably the ten edited volumes published by Harvard around fifteen years ago (which are not authored by her, but for which she and Grim serve as series editors).¹² My focus in *Consecrating Science* is on science-based ecospirituality, and specifically, science-based mythmaking endeavors, ranging from those of Richard Dawkins, to E. O. Wilson, to a host of religious naturalists and religionists, all engaged in projects that narrate or inspire a single unified story of the human and the broader cosmos as a replacement religion. Only one chapter (of seven) in my book deals with the Universe Story! *Journey of the Universe*. As such, work like Tucker's in religion and ecology that teases out the green teachings of Daoism or Islam or other major faiths is not within the purview of this book. Nor, for the same reason, do I concern myself with how Berry's disciples continue his Great Work in Montessori schools, or Catholic retreat centers, or biodynamic farms in Australia.

But Tucker does raise an important question, one that I too have raised in a previous author-critics forum (Sideris 2015a): What exactly *is* the relationship between Tucker and Grim's world religions project and Swimme and Tucker's *Journey* project? In the present forum, she describes her engagement with religion and ecology, such as the Harvard book series, as a complement to *Journey*, explaining that the former identifies environmental values in specific traditions, while the latter gives a deep time perspective. Yet, as I have noted, *Journey* is oddly silent on the relationship between the world religions and its own storyline of a single comprehensive narrative. Moreover, as I show in my book, the diagnosis that extant religious traditions are dysfunctional (mostly those of the West, of course) is made explicitly in various places, by both Berry and Swimme, and it is at least implicit in Tucker's account of the *raison d'être* of *Journey* as providing a "functional and engaged cosmology." Are the world religions not functional and engaged enough? If world religions are brimming with green insights and wisdom, then why do we need a Universe Story at all? I suspect that the reason for *Journey's* existence has to do with a preference for unity and overall coherence, a conviction that all extant narratives must somehow become one. But why must they? Is it because science and religion have to agree on a creation story? Is it because a single, all-encompassing story is deemed more powerful? Is *Journey* intended for people who do not subscribe to one of the existing faiths? Is it driven by Tucker's intuition that lots of people like big stories? I still am not sure.

ANTHROPOCOSMISM AND/AS ANTHROPOCENTRISM

I noted above a cluster of reviews of *Journey* that respond favorably to reassurances that humans have a special, and indeed inevitable, place or purpose in the cosmos. These readers, like *Journey* itself, are a bit vague on this point but they correctly perceive that the story sets humans apart and establishes us as a wondrous cosmic creation. In her response to me, Tucker insists that the worldview at the heart of *Journey* is not anthropocentric but what she calls anthropocosmic. Anthropocosmism is defined by Tucker in this forum as the understanding of “the human as that being who *completes the cosmos*” (my emphasis). She defines it similarly in *Worldly Wonder* as the idea that “humans complete the natural and cosmic world by becoming participants in the dynamic transformative life processes” (Tucker 2003, 48). This sounds awfully grandiose. For further elaboration on this idea, Tucker invokes Tu Weiming’s definition of anthropocosmism, which holds that humans are not just another part of the “chain of being” (an image already redolent of hierarchy) but have a particular “uniqueness” that is reflected in the “intrinsic capacity of the mind to embody the cosmos.” Through its embodying of the cosmos, the mind “assists in the cosmic transformation of Heaven and Earth” (quoted in Tucker, 2003, 48–49). This lofty, and highly flattering, portrait of the human accords with some reader responses to *Journey* that cite the special role of humans in the cosmos.

Anthropocosmism, then, is no garden variety anthropocentrism. It is anthropocentrism on steroids. In a chapter of *Living Cosmology* called “Influences of Pierre Teilhard de Chardin on *Journey of the Universe*,” Tucker again invokes the indispensability of Teilhard’s insight of humans “completing the world.” *Journey*, she concludes, similarly understands completing the world “as essential to transforming the face of the Earth” (Tucker 2016, 72). Why do the Earth and its dynamic processes need to be *transformed*? Is not human transformation rather the problem? This valorization of the human as completing the cosmos through assisting the transformation of life and Earth processes might readily sanction any number of perilous engineering projects, ranging from gene editing technologies to engineering the planet and its climate as a whole. As I document in my book, completing the universe meant for Teilhard that humans are the beings destined to direct the unfolding of the universe, through the evolution of the noosphere, or sphere of mind, that ultimately envelops and transforms the planet’s biosphere through human thought and technologies. Wittingly or not, this excited talk of transformation aligns Tucker’s project with deeply troubling Anthropocene visions of planetary management.

Oddly, Tucker—who, along with Grim, has presided over the American Teilhard Association for years—now appears, in this forum, to want to play down Teilhard’s influence on her project. She chides me for failure

to cite a lecture of Berry's in which he too, apparently, worked to distance himself from Teilhard's technophilic and other excesses. However, I do acknowledge Berry's divergence from Teilhard on these and other issues: "Berry himself," I write in *Consecrating Science*, "set out to temper Teilhard's overly optimistic, human-centered assessment of technological progress as a benign outgrowth of human creativity, and the power of science to enhance human life." I go on to say that Berry's coauthored work with Swimme "warns of an alluring but dangerous 'mystique' of technology, juxtaposing a possible 'Technozoic' future with the more holistic, healing vision represented by [Berry and Swimme's] Ecozoic." (Sideris 2017, 124). As I argue, Berry and Swimme's work nevertheless retains the imprint of Teilhard's thought in a variety of demonstrable ways, even while Berry did not share Teilhard's enchantment with technology. Above all, I argue, *Journey of the Universe* retains this imprint, not in glorifying technology per se (though neither, clearly, is it well-positioned to critique it), but in its commitment to humans as the entity that oversees and transforms planetary and cosmic unfolding, the being without whom the universe is unfinished.

If, as Tucker observes, "Sideris is worried about [Teilhard's] influence," Tucker seems a bit worried about it too. To her credit, she admits to some uneasiness with Teilhard's uncritical embrace of technology, and presumably, too, with the subsequent flowering of Earth-fleeing transhumanists and Anthropocene boosters who regard Teilhard (not wrongly) as a founding figure (Sideris 2016). All of this raises a larger question of why Tucker's work, and indeed so much work in religion and ecology, remains fiercely loyal to Teilhard, given his many liabilities. If Teilhard's legacy is so fraught—vulnerable to charges of human exceptionalism, Eurocentrism, and technomastery (commitments Tucker and Berry attempt to excuse or excise), not to mention the resurgence of troubling allegations about Teilhard's investment in eugenics¹³—then why carry on with him? Are there not better, more "ecological"¹⁴ thinkers to think with?¹⁵ What makes his work so irresistible? The answer, I think, lies in an attraction to Teilhard's obsessively global vision, and a reluctance to give up what Tucker calls his cosmological insights, which position humans as the perfecting force that puts the finishing touches on the cosmos. This anthropocosmic message is one that some readers of *Journey* are obviously receiving loud and clear, judging by online reviews.

SCALED-UP LOVE AND THEISTIC WONDER: *LAUDATO SI'* AND
CONSECRATING SCIENCE

A religiously inspired global vision need not take a turn toward pernicious "centrism" of various sorts, nor promote a techno-transcendent agenda like Teilhard's, as Colin McGuigan's excellent essay reminds us. His essay

also gives me additional grounds for admiring a figure whose insights regarding wonder and its relation to technology and science have much to teach the new cosmologists and me, namely Pope Francis.¹⁶ Ever since my initial reading of *Laudato si'* I have been drawn to Francis's evocations of wonder, and I have even discerned, or thought I imagined, certain parallels between his vision of nature in the encyclical and Rachel Carson's worldview and warnings. I wondered whether her writing might appear somewhere on Francis's seemingly extensive but (to my knowledge) largely unpublicized reading list. So, there is something heartening and eerily familiar to me in McGuigan's exposition of Francis's sense of wonder. I am especially intrigued to find him arguing that my own account of wonder "resonates well with the frequent (and underrecognized) invocations of the concept of wonder by Pope Francis." If that is true, then my message in *Consecrating Science* has not gotten completely lost.

Of course, McGuigan also notes that Francis's account, and particularly his greater openness to the wonder-mediating power of science and technology, offers some corrections to my view. I am inclined for the most part to accept his corrections without much resistance. But a thoughtful paper deserves a more thoughtful response than that, so I will elaborate on and qualify my concurrence.

McGuigan is right that it is "hard to miss wonder's presence in *Laudato si'*." He delves into a variety of Francis's (formerly, Bergoglio's) writings, published prior to the famous encyclical, that illustrate his commitment to a form of wonder that is found in direct sensory encounters, and that remains perennially open to surprise and to the genuine otherness of the other. To cultivate wonder, Francis believes, is also to cultivate self-restraint, generosity, vulnerability, and compassion, and other virtues that have environmental significance. The diminishment and loss of wonder not only eclipses joy itself, Francis believes, but encourages vicious self-referentiality and idolatry of various sorts (much as I argue in *Consecrating Science*). But Francis seems more comfortable than I am with the ways in which science and technology can also "mediate encounter with nature," McGuigan argues, and some of these encounters are precisely the sort that we (and nature), in our commingled crises, desperately need. In this context, McGuigan, like Schaefer, refers to the "perceptual scale enabled by scientific inquiry." What he calls the "deliverances of science" are necessary in order to bridge the perceptual gap between the human and the Earth (or "world"). Why must this gap be bridged? Like Schaefer, McGuigan is concerned about large-scale issues like climate change, and (channeling Francis) he doubts the sufficiency of face-to-face encounters. As he puts it, "love is not enough," or specifically, love needs "long arms." Certain institutional mediations of scale are necessary in order to scale up individual practices themselves, and thereby address "the social conditions which are the source of the suffering encountered at the face-to-face level."

Similarly, certain harms cannot be registered without scientific and technological tools, notably harms that may originate at the individual level but manifest themselves imperceptibly to individuals, such as the impacts of our consumptive practices. These mediations, McGuigan wants to say, do not isolate us from one another but allow us to see and be touched by real suffering.

Assuming that I have understood McGuigan's argument correctly, such mediating uses of science and technology do not strike me as problematic, and indeed they may, as he says, be necessary and virtuous. However, *wonder* seems to have slipped out of the discussion somewhat, replaced by something like love, or "intimacies." Also, it is not clear to me that a response *to nature* is always what is being mediated by these technologies, as McGuigan describes them; rather, in most of the examples he cites, the main focus seems to be, as it often is for Francis, on social justice concerns that are also, invariably, connected to environmental harms, as with climate change. The point is just that my claims in *Consecrating Science* are more about wonder than love per se, and particularly, wonder that, while it is experienced by humans, is oriented toward the more-than-human realm.

Wondering or wondrous encounters are not necessarily encounters of loving intimacy. This is not to deny that wonder is related to love or might engender it, particularly agapic love understood in nonutilitarian or non-possessive terms. But wonder for nature and nonhuman beings may entail that we *not* engage them with love as we normally understand and express it, and even that we *not* intervene in their suffering as we would (or should) for a fellow human. This is an argument I made some years ago in my first monograph, though without wonder as the central theme (Sideris 2003). Respecting nature's otherness—nonhumanness—may demand a different response, perhaps something even more difficult than love. That said, wonder is a close partner with empathy, a disposition that is attuned to the variety of ways we can experience and respect what is truly other. Empathy, an ability to take on another's perspective, cognitively or affectively, without dissolving the otherness of the other, can be a powerful environmental virtue, one that may be cultivated through technology and media, notably film (Sideris 2010). I think empathy gets at some of what McGuigan and Francis want to preserve and strengthen. In short, McGuigan offers an important clarification about the way in which mediation, not just immediate encounter, is part of a robust ethical response to large-scale social and environmental problems.

He raises other questions about mediation as well. He picks up on a claim I made in a different context several years ago, in which I indicate an inclination toward nontheistic over theistic forms of wonder. My concern is (or was) that, just as excessive wonder at science may treat nature as something that points to what is *more* wondrous—science, the human mind—theistic wonder might treat nature merely as a signpost to God,

as in a primitive form of natural theology. In both cases, wonder “ends,” in more than one sense, in that which it seeks—scientific knowledge or the divine. Nontheistic wonder, on the other hand, does not leave nature behind, does not eclipse or transcend it, but preserves and dwells in nature as an enduring object of wonder and ecological concern.

McGuigan, drawing again on Francis, points out that this analogy does not necessarily hold: science as the ultimate object of wonder may gather self-congratulatory power unto itself by explaining nature away, but the deity as the ultimate object of our wondering response does not function merely as an explanation of the natural world. “God” (shall we say) is not merely the *explanans* to nature’s *explanandum*, to use McGuigan’s terms. Indeed, a crude understanding of religion as functioning as a rival explanation to science is one I critique as a hallmark of consecrated science and its tendency to infantilize religion. (McGuigan is perhaps too generous to point out my contradiction, but too smart not to have noticed.) The relationship between the deity and nature—or creation, as Francis would say—is far more complex and mysterious than that of mere explanation. For, as McGuigan says of Francis, there is an “imbrication of the earthly and the heavenly that inoculates his species of theistic wonder against the reduction of created otherness to disposable stepping stones on the way to divinity.” He continues, “Transcendence for Francis is to be sought by descending deeper into the world and its possibilities, not leaving or pushing beyond it.” This is a very astute (and beautifully phrased) correction. I think McGuigan captures in this account of theistic wonder much of what is so attractive to me about *Laudato si’*—the ineradicable mystery in Francis’s vision of nature, as embodied in this reverberating imbrication of the divine and the earthly.¹⁷

Talk about wonder-evoking theisms and nontheisms, of divine and earthly depths, raises a final question, one that Tucker essentially puts to me, of why religion seems to play so little role in my analysis of wonder, especially in my *own* apology for wonder. Indeed, where is religion at all in *Consecrating Science*? My intention was to write the book in such a way that its arguments, and especially its articulation of wonder, might be legible and persuasive to a variety of readers, regardless of religious commitments or lack thereof. Perhaps, in this one sense at least, my approach is not so different from *Journey of the Universe*, with its imperceptible, invisible weaving of religion into a secular-sounding narrative. Religion is there, for me, on every page of *Consecrating Science*. I have hidden it in plain sight.

NOTES

1. Likely etymological connections here between root, rooting out, uprooting, and race (racine, radix) are suggestive.
2. See, for example, a conversation between Warren and Tucker promoting *Journey* (Mowe 2016).

3. In fact, some reviewers of the film on Amazon.com complain that the science presented in *Journey* takes great liberties with established knowledge of cosmology or biology.

4. Dennis, "Review of *Journey of the Universe*," October 24, 2018. Goodreads: <https://www.goodreads.com/book/show/11804499-journey-of-the-universe>, " <https://www.goodreads.com/book/show/11804499-journey-of-the-universe>. My emphasis.

5. Patricia Scott, "Review of *Journey of the Universe*," November 30, 2011. https://www.amazon.com/Journey-Universe-Brian-Thomas-Swimme/product-reviews/0300209436/ref=cm_cr_getr_d_paging_btm_next_4?ie=UTF8&reviewerType=all_reviews&pageNumber=4. My emphasis.

6. Cornelia Serna, "Review of *Journey of the Universe*," November 1, 2016, https://www.amazon.com/Journey-Universe-Brian-Thomas-Swimme/product-reviews/0300209436/ref=cm_cr_ar_p_d_paging_btm_next_5?ie=UTF8&reviewerType=all_reviews&pageNumber=5. My emphasis.

7. Julianne Lutz Warren, "Review of *Journey of the Universe*," November 7, 2011. https://www.amazon.com/Journey-Universe-Brian-Thomas-Swimme/product-reviews/0300209436/ref=cm_cr_ar_p_d_paging_btm_next_2?ie=UTF8&reviewerType=all_reviews&pageNumber=2

8. Randy Overholt, "Review of *Journey of the Universe*" (DVD), March 7, 2015. https://www.amazon.com/Journey-Universe-David-Kennard/dp/B079WN6G8V/ref=sr_1_1?ie=UTF8&qid=154955157&sr=8-1&keywords=journey+of+the+universe#customerReviews. My emphasis.

9. David Milliern, "Review of *Journey of the Universe*," February 6, 2013. https://www.amazon.com/Journey-Universe-Brian-Thomas-Swimme/product-reviews/0300209436/ref=cm_cr_getr_d_paging_btm_next_7?ie=UTF8&reviewerType=all_reviews&pageNumber=7. My emphasis.

10. Scott O'Reilly, "Review of *Journey of the Universe*," April 22, 2012. https://www.amazon.com/Journey-Universe-Brian-Thomas-Swimme/product-reviews/0300209436/ref=cm_cr_ar_p_d_paging_btm_next_2?ie=UTF8&reviewerType=all_reviews&pageNumber=2 My emphasis.

11. Puzzled by Tucker's allegation, I tracked down the quote and checked it against my endnotes. My endnote indicates that the quote appears on page 16 of Berry's *Dream of the Earth*, but it appears on page 18 of my edition. This is a typo, not a distortion.

12. My point in saying this is not in any way to denigrate this project or Tucker's involvement in it—it is significant and ambitious work—but just to note that even if they were directly germane to my inquiry, these volumes do not contain her own research and writing.

13. John Slattery (2017) argues that Teilhard's racism is foundational rather than incidental to his cosmology.

14. John Haught's efforts (2019) to defend Teilhard against charges like Slattery's are fairly damning in their own right, as when he wishes Teilhard "had expressed himself more clearly" regarding race, or laments that he was not "more ecologically sensitive, less Eurocentric . . . more attuned to the ambiguities of technology," as well as more "Darwinian" rather than "Lamarckian" in his evolutionary philosophy (in fact, greater attention to Darwin would have undercut Teilhard's theories of race). Which raises, again, the question: why put a figure known to be ecologically insensitive, scientifically misguided, and uncritically enthusiastic about technology at the heart of *religion and ecology*?

15. In this context, Tucker seems to suggest that Rachel Carson is to me what Teilhard or Thomas Berry is to her—a virtually inerrant and eternal source of wisdom, or even orthodoxy. As I think my book makes clear, I draw on many different thinkers in developing a defense of wonder. But the fact remains that some thinkers age better than others.

16. My recently published article in *The Trumpeter* (Sideris 2018) sets forth my own interpretation of Francis's views of science and technology, contrasting them favorably with other globalizing and totalizing philosophies, notably certain forms of what is called integral ecology.

17. Have I just gone all Heideggerian? Apologies to Schaefer.

REFERENCES

Alaimo, Stacy. 2010. *Bodily Natures: Science, Environment and the Material Self*. Bloomington: Indiana University Press.

- Barlow, Connie. 1997. *Green Space, Green Time: The Way of Science*. New York, NY: Copernicus.
- Carson, Rachel. 1962. *Silent Spring*. Boston, MA: Houghton Mifflin.
- Eger, Martin. 2006. "Hermeneutics and the New Epic of Science." In *Science, Understanding, and Justice*, edited by Abner Shimony, 261–80. Chicago, IL: Open Court.
- Fredericks, Sarah E. 2019. "Reacting to Consecrating Science: What Might Amateurs Do?" *Zygon: Journal of Religion and Science* 54:354–381.
- Hesketh, Ian. 2015. "The Recurrence of the Evolutionary Epic." *Journal of the Philosophy of History* 9:196–219.
- Haight, John. 2019. "Trashing Teilhard: How Not to Read a Great Religious Thinker." *Commonweal*. January 28. <https://www.commonwealmagazine.org/trashing-teilhard>
- Hulme, Michael. 2010. "Cosmopolitan Climates." *Theory, Culture, and Society* 27:267–76.
- Keen, Sam. 1973. *Apology for Wonder*. New York, NY: HarperCollins.
- Larson, Brendan. 2011 *Metaphors for Environmental Sustainability*. New Haven, CT: Yale University Press.
- Leifert, Harvey. 2019. "Climate Change Brings Extreme Weather." *Physics World*. January 14. <https://physicsworld.com/a/climate-change-brings-extreme-weather/>.
- Markman, Art. 2018. "Why People Aren't Motivated to Address Climate Change." *Harvard Business Review*. October 11. <https://hbr.org/2018/10/why-people-arent-motivated-to-address-climate-change>
- McGuigan, Colin. "Wonder Opens the Heart: Pope Francis and Lisa Sideris on Nature, Encounter, and Wonder." *Zygon: Journal of Religion and Science* 54:396–408.
- Mowe, Sam. 2016. *The Unfolding Story of the Universe: A Conversation with Mary Evelyn Tucker and Julianne Warren*. Garrison, NY: Garrison Institute.
- O'Dell-Chaib, Courtney. 2019. "The Shape of This Wonder? Consecrated Science and New Cosmology Affects." *Zygon: Journal of Religion and Science* 54:387–395.
- Rolston, Holmes, III. 2019. "Lame Science? Blind Religion?" *Zygon: Journal of Religion and Science* 54:351–353.
- Rudiak-Gould, Peter. 2013. "'We Have Seen Climate Change with Our Own Eyes': Why We Disagree about Climate Change Visibility." *Weather, Climate, and Society* 5:120–32.
- Schaefer, Donovan O. 2019. "Mere Science: Mapping the Land Bridge between Emotions, Politics and Ethics." *Zygon: Journal of Religion and Science* 54:382–386.
- Sideris, Lisa H. 2003. *Environmental Ethics, Ecological Theology, and Natural Selection*. New York, NY: Columbia University Press.
- . 2009. "Fact and Fiction, Fear and Wonder: The Legacy of Rachel Carson." *Soundings: An Interdisciplinary Journal* 91:335–69.
- . 2010. "I See You: Interspecies Empathy and 'Avatar'." *Journal for the Study of Religion, Nature, and Culture* 4:457–77.
- . 2015a. "The Confines of Consecration: A Reply to Critics." *Journal for the Study of Religion, Nature and Culture* 9:221–30.
- . 2015b. "On Letting a Thousand Flowers Bloom: Religious Scholarship in a Time of Crisis." Roundtable on Climate Destabilization and the Study of Religion. *Journal of the American Academy of Religion* 83:356–72.
- . 2016. "Anthropocene Convergences: A Report from the Field." In *Whose Anthropocene? Revisiting Dipesh Chakrabarty's "Four Theses,"* edited by Robert Emmett and Thomas Lekan, 89–96. Munich, Germany: RCC Perspectives: Transformations in Environment and Society.
- . 2017. *Consecrating Science: Wonder, Knowledge, and the Natural World*. Oakland: University of California Press.
- . 2018. "Techno-Science, Integral Thought, and the Reality of Limits in *Laudato si'*." *The Trumpeter: Journal of Ecosophy* 34 (1):14–35.
- Slattery, John. 2017. "Dangerous Tendencies of Cosmic Theology. The Untold Legacy of Teilhard de Chardin." *Philosophy and Theology* 29:69–82.
- Smocovitis, Vassiliki Betty. 1999. "The Tormenting Desire for Unity." *Journal of the History of Biology* 32:385–94.
- Swimme, Brian Thomas, and Mary Evelyn Tucker. 2011. *Journey of the Universe*. New Haven, CT: Yale University Press.
- Tuana, Nancy. 2008. "Viscous Porosity: Witnessing Katrina." In *Material Feminisms*, edited by Stacy Alaimo and Susan Hekman, 188–214. Bloomington: Indiana University Press.

- Tucker, Mary Evelyn. 2003. *Worldly Wonder: Religions Enter Their Ecological Phase*. Chicago, IL: Open Court.
- . 2015. "Journey of the Universe: An Integration of Science and Humanities." *Journal for the Study of Religion, Nature, and Culture* 9:206–12.
- . 2016. "Influences of Pierre Teilhard de Chardin on *Journey of the Universe*." In *Living Cosmology: Christian Responses to Journey of the Universe*, edited by Mary Evelyn Tucker and John Grim. Maryknoll, NY: Orbis Books.
- . 2019. "Journey of the Universe: Weaving Science with the Humanities." *Zygon: Journal of Religion and Science* 54:409–425.