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14. Contested Wonder

Biological Reductionism and Children's Nature Education

Lisa Sideris, Indiana University

Introduction

In an address to the Aspen Environmental Forum in 2008, sociobiologist E. O. Wilson made the provocative suggestion that the child-rearing practices of “soccer moms” pose a key threat to the nature education of today’s youth. “The worst thing you can do to a child,” Wilson opined, “is take them on a hike through a botanical garden, where there are the names of the trees on the side” (quoted in Hymas). In opening remarks to the same forum in 2012, Wilson reiterated this basic philosophy: “You’ve got to get the kid out in the woods, in the natural environment as much as you can, and leave them alone. The worst thing you can do is to take them down the path of some nature park that has the label on each tree and tell them to be careful not to step off the trail because there might be snakes. What a terrible way to introduce them to nature. Turn ‘em loose!” (quoted in Nicholas). In both cases,

Wilson then went on to invoke the sage advice of environmental pioneer Rachel Carson who instructed parents (in Wilson's words) to "take the child to the seashore, turn her loose with a pail, and tell her to go explore the tidepools. Don't tell her the names of any of these things. Let her find them, let her bring them to you . . ." (quoted in Hymas).

Hyperbole aside, Wilson's point about children's need for free and unscripted play in nature – outdoor activities distinct from competitive sports or passive memorization of taxonomy – is well taken. This position has been defended not only by Carson but more recently by authors such as Richard Louv, whose *Last Child in the Woods* kindled parents' nostalgia for bygone days when children roamed the countryside without cellphones and built tree forts without building permits.

Just what constitutes actionable parenting practices nowadays is a topic about which Richard Dawkins has also made a number of typically uncensored remarks. Dawkins has long taken an interest in children's science and nature education and religious indoctrination. He once launched a diatribe against a London newspaper that ran what it intended as a heartwarming photo of three children taking part in a Nativity play at Christmastime. What drew Dawkins' wrath was the newspaper's description of three children as Muslim, Hindu, and Christian, respectively. "How can you possibly describe a child of four as a Muslim or a Christian or a Hindu or a Jew?" Dawkins demanded. "Would you talk about a four-year-old economic monetarist? Would you talk about a four-year-old neo-isolationist or a four-year-old liberal Republican? . . . Do you see what I mean about mental child abuse?" (2012: 566).

Not content to chastise weary soccer moms or newspaper reporters giddy with Christmas cheer, Wilson and Dawkins have taken a more targeted approach to influencing children and parents. Wilson's semi-autobiographical coming-of-age novel *Anthill* hit bookstores in 2010. In 2011, Dawkins released his own book aimed at children and young adults – a brightly illustrated book of answers titled *The Magic of Reality: How We Know What's Really True*. Wilson and Dawkins are two of the most prominent ambassadors of the world of science. Opinionated and controversial though both of them are, they have played a significant role in shaping public understanding of science. As I see it, these books, aimed at younger audiences are part of a larger effort to control the discourse surrounding wonder – in this case, children's wonder – and its relationship to science and religion. In particular, Wilson and Dawkins are both invested in shaping children's perceptions of what constitutes reality. Dawkins is unequivocal in his defense of science as the only authentic means of accessing reality – and its distinctive and superior brand of "magic." Introducing children to the "real world" carries a certain urgency for Dawkins, because he means to draw them into the joy of scientific explanations *before* they can be seduced by the "false" myths purveyed in religion or fairy tales. Wilson's approach is more complex, as suggested by his invocation of Rachel Carson's philosophy that direct, sensory engagement with "nature" – not nature in the lab or classroom – is integral to the well being of children. Taken as a whole, Wilson's pronouncements about science, nature, and religion suggest a deep divide within his own value system, and this conflict often interferes with his defense of nature as valuable in its own right.

Magic, Poetry, and Science

Dawkins' interest in children's education is not new, though, like the neo-atheist phenomenon as a whole, it seems to have ramped up significantly since September 11, 2001. Several years ago, Dawkins famously published a letter to his daughter Juliet – who was ten years old at the time – titled “Good and Bad Reasons for Believing.” The letter urges her to remain on guard against belief without evidence and to put her trust in scientists, who remain “the specialists in discovering what is true about the world . . .” (2003a: 242). For Dawkins, the category of problematic belief includes virtually everything ranging from children's fairytales, to Santa Claus, to programs like *The X-files*, to fundamentalism. He has been a vocal critic of the Harry Potter series for promoting what he calls “anti-scientific” beliefs and a fondness for myths and fairy tales. Not surprisingly perhaps, he is a fan of Philip Pullman's books such as the *The Golden Compass*, which many readers have perceived to be hostile to Christianity (Beckford and Khan).

While few would defend the *scientific* merits of the Harry Potter series, Dawkins' claim that these books are *anti-scientific* and potentially harmful reflects his conviction that childhood immersion in myths and fantasies of any sort actually hinders development of cognitive and imaginative faculties. He disapproves of C. S. Lewis' *The Lion, the Witch and the Wardrobe* for its reliance on “a magic wardrobe to pass through” and other invocations of what he calls a “fake world of wonder” (2003b: 231). Dawkins has also delivered The Royal Institution's Christmas Lectures for children, a British holiday tradition. His lecture series, titled “Growing Up in the Universe,” urges children to shed all superstitious thinking and to regard with great suspicion all claims of the “uncanny” (1991). He writing also discourages children from thinking of science as something fun and larky. Popular science demonstrations featuring “fun explosions” and “whacky ‘personalities’” only “store up trouble for the future,” he ominously warns (1998: 22).

Early press releases for *The Magic of Reality* gave it the working title “What is the Rainbow, Really?” Dawkins has a longstanding interest in the rainbow as a contested icon of wonder. His 1998 book, *Unweaving the Rainbow*, chides the romantic poets who resented Newton for explaining the rainbow and thus demolishing its aesthetic, mystical, and even religious, appeal. The central message of *Unweaving the Rainbow* is that scientific explanations are more interesting, satisfying, and even more wondrous, than the erstwhile mystery that prompted investigation. He offers *Unweaving the Rainbow* as a consolation prize for readers left bereft and despairing by revelations about nature and human nature contained within Dawkins' breakthrough book, *The Selfish Gene*. “In this book I shall try a more positive response, appealing to the sense of wonder in science because it is so sad to think what these complainers and naysayers are *missing*” (1998: x). Specifically, the complainers are missing the “deep aesthetic passion,” the “music and poetry” of the scientific perspective. In short, Dawkins tries to make it up to us by steering us toward the superior forms of wonder afforded by scientific investigation. “If you think the rainbow has poetic mystery, you should try relativity [theory]” (1998: 42). Science reveals “strangeness beyond wild imagining” but no spells, wizards, or witches. It allows “mystery but not magic” (1998: 29).

The line between mystery and magic is not always easy to patrol, even for Dawkins, but it appears that he has gradually warmed to the word magic. In a more recent interview,

Dawkins concedes that it was difficult for him to put the word magic in the title of his book for children, *The Magic of Reality* – after all, he accused C. S. Lewis of stooping to magical wardrobes (Attenborough and Dawkins). He defends a distinction between magic “as in a magic trick, and the magic of the universe . . . which one uses in a poetic way.” Science, Dawkins has argued repeatedly, is the poetry of reality. Unlike other kinds of magic, the poetic magic of science is real. *The Magic of Reality* is intended as a myth-busting book for kids. By “myths” he means everything from fairytales about the rainbow’s origin to “Judeo-Christian myths” such as Noah’s Ark. The book addresses a number of questions a child might ordinarily encounter in Sunday school, such as: “what is the origin of night and day?”; “who were the first man and woman?”; “when did everything begin?”; and even “Why do bad things happen?” (2011) A chapter on the sun presents Aztec, Egyptian, and Aboriginal myths, prior to displacing each of these with an account of the sun’s true nature. Though Dawkins encourages children to make up their own minds, the book’s message is essentially the same as *Unweaving the Rainbow*: what is real in the scientific sense is, without question, most deserving of wonder. Science is not one way of experiencing wonder. It is the only authentic way. “I want to show you that the real world, as understood scientifically, has a magic of its own,” Dawkins writes, “an inspiring beauty which is *all the more magical* because it is real and because we can understand how it works . . . The magic of reality is – quite simply – wonderful. Wonderful, and real. Wonderful *because* real” (emphasis added). Supernatural belief and magician’s tricks, appear “cheap and tawdry” by comparison (2011: 32).

This formula – “wonderful because real” – is one children may well resist. In his more candid interviews, Dawkins even admits to a brief but dangerous childhood flirtation with fairy tales and fantasy, which he also blames for a fleeting susceptibility to religious belief. He was led eventually to biology by a fascination with what he calls puzzles or problems, not by attraction to the natural world per se. “I was never a boy naturalist,” he admits. This admission appears in an illuminating exchange between Dawkins and British natural history filmmaker David Attenborough. Asked to comment on the most exciting point in their respective careers, Dawkins and Attenborough give strikingly different responses. “One would be when I first dived on a coral reef,” Attenborough recalls, “and I was able to move among a world of unrevealed complexity.” Dawkins then gives his answer: “Something to do with a puzzle being solved” he ventures. “Things fall into place and you see a different way of looking at things which suddenly makes sense” (Attenborough and Dawkins). Where Attenborough recalls wonder at the complexity and strangeness of an almost alien realm, Dawkins wonders at the way in which everything finally makes sense. One can sense his sigh of relief that the world is not so strange after all. For Dawkins, all mysteries are problems, and the solution is more interesting and beautiful than the puzzle.

Dawkins, who lived in Kenya for a good part of his early childhood, is often asked if the African landscape shaped his choice of biology as a profession. A child of botanists, Dawkins recalls that his parents could identify virtually every plant and flower, and that he and his sister were drilled from an early age. Nature, under his parents’ tutelage, was the veritable botanical garden – ordered and precisely labeled – against which Wilson warns. As for the wilds of Africa, the impact was negligible. “Africa was lost on me,” he says. He states that he cared little for “watching wild creatures: my original interest in biology came not from the woods and moors but from books” (2009). Above all, what captured his

imagination and propelled him to a career in biology was the concept of organisms as “survival machines.” “When you study animal behavior,” Dawkins explains, “you’re looking at the product of a kind of piece clockwork machinery” (Hall).

The Book of Science and the Book of Nature

Dawkins’ constant refrain that scientific reality is what is *most* magical often entails an explicit comparison between science and what we might broadly call religion – cultural myths and cosmologies, folktales, creation stories. However, a closer look suggests an implicit contrast between science and *nature* as well. That is, Dawkins dismisses as “mystical” any form of wonder that is unmediated by science, or that looks upon the natural world in a scientifically untutored way. He seeks to “reclaim for real science that style of awed wonder that moved mystics like [William] Blake” (1998: 18). The boy who studied books, not nature, takes issue with Blake’s preference for “bask[ing] in wonder” and “revel[ing] in mystery” rather than working, as a scientist does, to find the solution. The implication is that Blake’s wonder is simply a function of his ignorance of science. It too closely resembles the “fake” wonder, “cheap” magic or “easy” miracles that hover over religion, fairy tales, or astrology. “The poetry is in the science” Dawkins insists, but one has to put in the work in order to receive the poetic vision (1998: 18). Simply gaping at nature will never bring true wonder.

The distinction I am suggesting here between science and nature was well-marked in nature-study movements for children popular a century ago. It is embodied in the famous injunction, typically attributed to the nineteenth century naturalist Louis Agassiz, to “study nature, not books.” Preserving the child’s innate sense of the world as magical and mysterious was part of that agenda. From the child’s perspective, nature-study pioneer Liberty Hyde Bailey argues, “there are elves whispering in the trees, and . . . chariots of fire rolling on the long, low clouds at twilight . . . the young mind is impressed with the mystery of the unknown. The child looks out to nature with great eyes of wonder” (36). Nature-study advocates presented children with a list of questions quite different from those Dawkins addresses in *The Magic of Reality*: “What does the flower think?” or “Who are the little people that teeter and swing in the sunbeam? What is the brook saying as it rolls over the pebbles?” (36). Bailey’s questions prompt the child to perceive nature as something animate and mysterious, not as a piece of clockwork machinery to be pulled apart and analyzed for clues. Nature-study insisted on a place for poetic interpretation in the teaching of nature – an interpretation that is not *unscientific* but that cannot be learned simply through facts. A kind of revolt against formal science and mechanical memorization, its lessons aimed to teach not facts but “spirit” – a point of view or a means of contact – that could pave the way for science education, but remained distinct from it (Bailey). An emphasis on naming things, and the habits that tend to come with naming – collecting and hunting – were to be discouraged. In short, Bailey urges, children should learn not zoology but *animals*; not botany, but *plants*. “Experience,” Bailey believed, “should come before theory,” as religion comes before theology, or words before language (197). Rachel Carson, who was herself steeped in the nature-study tradition as a child, echoes these guidelines for introducing children to nature in her classic work *The Sense of Wonder*. There she discourages parents from teaching children the “game of identification” – i.e., names and facts about plants and animals – and instructs them instead to engage the child’s emotional and sensory responses to nature (94). Scientific

curiosity about facts and details would follow later in life, but one's moral relationship to nature would be cemented by these early encounters with it as something inherently valuable and mysterious.

Naturalist

The distinction between science and nature-study also hints at differences between the scientist and the naturalist. In his conversation with Dawkins, Attenborough claims the title of naturalist for himself – “I am a naturalist rather than a scientist,” he attests. One could be both, but being a naturalist suggests, among other things, a more generalist bent, or at least an ability to move back and forth between the specialists' account and more immediate – *unmediated* by science – perceptions of nature that are part of humans' lived experience.

Interestingly, E. O. Wilson also claims the title of naturalist for himself in his autobiography (2006). As with Carson and the nature-study philosophy in general, Wilson urges that hands-on experience with organisms rather than “systematic knowledge” goes into the making of a child *naturalist*. A child's mind is “prepared for wonder,” Wilson writes, “He is like a primitive adult of long ago, an acquisitive early [human]” (2006: 11). Readers familiar with Wilson's larger body of work will recognize that in this analogy between the child's mind and that of the primitive human, Wilson is subtly invoking his theory of biophilia – the idea that humans are innately drawn to nature and that our responses have adaptive value. In the child's response to the ocean, he notes, we see a recurrence of our ancestors' recognition of oceans as “sources of food and barriers against enemies” (2006: 11). Our responses to the sea are encoded in our genes, reinforced by what Wilson calls “epigenetic rules” that helped our ancestors survive. Past evolution prepares us to respond with wonder to encounters that are, for the child (though not the species), fresh and new. The child's wonder is thus borne simultaneously of novelty and atavism. The child does not know that her attraction to the sea carries an ancient adaptive function; she simply finds it wondrous.

Wilson's penchant for words such as *encoding*, *programming*, *epigenetic rules*, and *algorithms* – terms that make a frequent appearance in his writing – is, like Dawkins' approach, decidedly disenchanting. But Wilson is in less of a hurry to turn the child, who is a born naturalist and generalist, into a scientist and specialist. “Better to be an untutored savage for a while, not to know the names or anatomical detail” (2006: 12). Again, he turns to Carson's *Sense of Wonder* as a case in point, adding that “she wisely took children to the edge of the sea,” where their imaginations would be ignited by the mix of novelty and atavistic associations (2006: 13). Carson, who often assailed the narrow vision of “the specialist,” believed that children should first engage the natural world with their senses and emotions, laying a moral groundwork for scientific curiosity later in life. With nature-study as the foundation, scientific inquiry would retain an ethical compass – and wonder would endure.

Wilson's ruminations on the child as a primitive endowed with an evolutionarily engrained attraction to nature reappear in his novel *Anthill*. The story's young hero, Raphael Cody, is “turned loose” by his parents “to wander about on his own.” Stripped of mechanical toys and sent out to play, children naturally revert to “hunter-gatherers,” Wilson writes. Once turned loose they “discover a multitude of kinds they have never seen in a zoo or picture book or television, and for which there is no name.” The child – if allowed to –

encounters plants and animals not as reified labels but in their “immediacy,” their “novelty and strangeness” (2011: 119-20).

The idea that children are instinctively engaged with the natural world was integral to children’s nature study at the turn of the twentieth century. As Kevin Armitage argues, “Nature study advocates found scientific justification for their bedrock belief that children needed unmediated interaction with the natural world to develop both mind and body” (72). As in Wilson’s biophilic account, this belief was bound up with an old evolutionary concept of recapitulation – that the child’s individual development repeats the evolutionary history of the whole human species: ontogeny recapitulates phylogeny. The child is naturally drawn to folk-tales, nature myths, and fairy tales at a certain stage in his development. This tendency was not to be discouraged but rather cultivated, at least for a time. “Therefore, teachers should not make the mistake of using methods of instruction” – including scientific instruction – “beyond the developmental stage of the child” (76).

A more gene-centered, reductionist version of the recapitulationist theory is key to Wilson’s account of children’s biophilia and his fictional portrait of Raff. Raff’s early nature education is largely solitary and self-taught, as was Wilson’s. Raff eventually comes under the influence of an ecologist named Norville (who narrates the story). The best way to learn a frog, Norville clearly instructs him is “*not by reading.*” Only by experiencing the frog where it lives in nature, his teacher advises, can Raff be “rooted in the full reality of frog” (2011: 124). The frog’s “full reality” will not be apprehended through science, least of all for the child. “Nature,” Wilson writes, “is the real world” (2011: 140), “a great living library” (2011: 152). This conviction that interacting with organisms in their natural homes will generate not only knowledge but sympathy and care was critical to the nature-study approach. The same conviction drives the storyline of *Anthill* and its overarching message is an explicitly environmental one (with a few gratuitous swipes at the fundamentalist religious culture of the Deep South, on the side). The adult Raff becomes not a scientist but an environmental lawyer – with an encyclopedic knowledge of ants. He never ceases to be a naturalist. On the whole, Wilson’s *Anthill* appears to honor the injunction of Agassiz, Bailey, and Carson to study nature, not books.

Never Wonder

Dawkins’ *Magic of Reality* on the other hand, seems to follow the imperative of Charles Dickens’ infamous character Gradgrind in *Hard Times*: “Never wonder.” As Dickens explains, “no little Gradgrind . . . had ever learnt the silly jingle, Twinkle, Twinkle little star; how I wonder what you are! . . . By addition, subtraction, multiplication, and division, settle everything somehow, and never wonder” (15, 62).

Indeed, some of Dawkins’ admirers who promote a quasi-religious movement rooted in evolutionary worldviews have taken this advice to heart. Proponents of the Epic of Evolution (epicofevolution.com) proffer their myth as a true – and therefore superior – myth that will better align humans with reality and help us discern purpose and meaning in our lives (see further, Sideris). Wonder at science, cultivated early in life, is understood as the most efficient way of *inoculating* children against religion, fantasy, and fairy tales. Self-styled “evolutionary evangelist” Michael Dowd, author of *Thank God for Evolution*, and his wife, science writer Connie Barlow, have created a promotional video for *The Magic of Reality*

(2011). Barlow, who introduces children to evolutionary rituals and songs, teaches an enlightened version of “Twinkle Twinkle” of which Dickens’ headmaster would heartily approve:

Twinkle twinkle little star / Now we know just what you are. Making atoms
in your core / Helium and many more. Twinkle twinkle little star / Now we
know just what you are (n.d.).

Dowd and Barlow hail the new atheists as “prophets of reality.” The sooner children get on board with reality, the better.

By contrast, Wilson’s approach seems to have more to commend it, particularly for anyone persuaded by nature-study’s commitment to cultivating the child’s imagination and wonder at mystery, along with his curiosity. But we should not overstate the differences between Wilson’s perspective and that of Dawkins and his devotees. Wilson and Dawkins are equally invested in reenchanting scientific narratives to stand in as superior myths to religion, even while Dawkins distances himself from the myth-making enterprise. It was Wilson who coined the phrase, “the Epic of Evolution,” in his Pulitzer Prize-winning book, *On Human Nature*, arguing that the evolutionary epic is “probably the best myth we will ever have” (1978: 201). Interestingly, Wilson’s call for an epic story that will give humanity a shared sense of origins and overarching purpose occurred around the same time that theologian and cultural historian Thomas Berry issued a call for a New Story to replace the dysfunctional and out of date narratives offered by the traditional faiths. A whole constellation of movements, variously called The Epic of Evolution, The Universe Story, The Great Story, The New Story, or Big History, have since sprung up; all have a similar agenda of imparting a new science-based origins story and cosmology that will orient us to what is *real*, who we are, and what matters most if we are to live sustainably on earth (Sideris). Along with Berry, Dawkins and Wilson are two of the guiding lights for some proponents of this movement. Dawkins’ followers see the Epic of Evolution as an innovative approach to children’s religious education, and *The Magic of Reality* perfectly suits their curricular ambitions (see The Great Story).¹

In this contest between science and religion as ultimate sources of wonder, nature itself often gets marginalized and devalued. That is, nature – as something other than an abstract set of scientific principles or a foil for humans’ grand intellectual adventures – is often difficult to locate. In fairness to Dawkins, he does not explicitly offer his approach as superior to nature-study philosophy that encourages children’s sensory and emotional engagement, but his criticisms of childhood indulgence in mystery and unscientific wonder (at any age) suggest that he would not sanction such methods. That Dawkins turns out not to be a particularly strong advocate for children’s sensory bond with nature is hardly surprising, given his stated preference for books rather than nature and his penchant for viewing organisms as genetic survival machines. It is surprising, however, that ambivalence regarding nature’s significance and value is a feature of Wilson’s worldview as well, given his autobiographical resemblance to Raff and his contributions to nature conservation. Even

¹ Dawkins, it should be noted, would likely be uncomfortable with allusions to his approach as religious, as he has chastised some religious naturalists for calling what they do *religion* (see 2003: 146).

Wilson's most impassioned pleas to save the planet fail to evoke the natural world in its immediacy and beauty.

Wilson's difficulty, I think, stems from his uncertainty regarding how to locate and define the ultimate sources of reality, wonder, and value. Followed to their logical conclusion, Wilson's main lines of argument – even those framed as calls for environmental stewardship – lead ineluctably back to the spiritual value not of *nature* but of *scientific materialism*. Works such as *On Human Nature* and *Consilience*, for example, clearly exalt science as the most spiritually ennobling and fulfilling enterprise humans can undertake. In *On Human Nature*, Wilson presents science as a grand, epic adventure and outlines its potential to displace traditional religion:

Scientific materialism . . . presents the human mind with an alternative mythology that until now has always, point for point in zones of conflict, defeated traditional religion. Its narrative form is the epic: the evolution of the universe . . . The evolutionary epic is mythology in the sense that the laws it adduces here and now are believed but can never be definitely proved to form a cause-and-effect continuum from physics to the social sciences, from this world to all other worlds in the visible universe, and backward through time to the beginning of the universe (1978: 192).

Consilience makes a similar case, slightly embellished, and asserted with greater conviction. The words myth and epic, however, begin to shed some of their associations with a disposition to *believe* or a lack of definitive proof: “The *true* evolutionary epic, retold as poetry, is as intrinsically ennobling as any religious epic” (1999: 289, emphasis mine). More recently, Wilson has affirmed that science is “in the process of hollowing out traditional, organized religion,” though he predicts that a “residue of spirituality” will likely remain, given what appears to be a genetic basis for this propensity (quoted in Adams). The key is to reorient this engrained spiritual impulse toward scientific materialism.²

Other works by Wilson, including *The Diversity of Life*, *The Future of Life* and *The Creation* often contain an odd mix of reverence for science, on the one hand, and reverence for nature, on the other. They further articulate Wilson's belief in humans' innate attraction to nature – biophilia – and argue that our genetic hardwiring provides a sociobiological basis for an environmental ethic. *The Creation*, as its title suggests, is Wilson's strongest appeal to religious believers to join the environmental cause; it is written as an open letter to a Southern Baptist minister whom Wilson respectfully addresses as “Pastor” throughout. Yet, even here, Wilson's appeal on behalf of nature becomes unhelpfully entangled in endorsements of his competing causes – evolutionary apologetics, sociobiological analyses of human nature, and the grandeur of science's quest for totalizing (consilient) knowledge. Wilson cannot seem to decide whether nature has value because it is instrumental to experiences of the ultimate wonder of science or whether science is valuable because it

² In *On Human Nature*, Wilson gropes for a way to effect this reorientation of the religious impulse toward the scientific enterprise: “The time has come to ask: Does a way exist to divert the power of religion into the services of the great new enterprise that lays bare the sources of that power?” (1998: 193). *Consilience* provides such an orientation.

enhances our apprehension of nature as the ultimate good. In *The Creation*, for example, the Japanese Maple – hailed by Wilson as “the world’s most beautiful tree” – is invoked not as an object of beauty or wonder in its *own* right but as evidence for our genetically hardwired (biophilic) reactions to certain types of tree canopies, and thus as evidence *against* the “blank slate” theory of human nature (though it is rather hard to imagine that Wilson’s Southern Baptist interlocutor is heavily invested in blank slate theories!) (2007: 66-67). Wilson clearly wants to defend another kind of value, namely, what he terms “stewardship,” but this value has interest to him largely because “it appears to arise from emotions programmed in the very genes of human social behavior” (2003: 122). The stewardship impulse, in other words, provides another case in point of his cherished biophilia hypothesis. Here is Wilson explaining the wonder of the humble mouse: “If the DNA helices in one cell of a mouse . . . were placed end on end and magically enlarged to have the same width as wrapping string, they would extend for over nine hundred kilometers . . . Measured in bits of pure information, the genome of a cell is comparable to all editions of the *Encyclopaedia Britannica* published since its inception in 1768.” (2003: 131). This “gee whiz” tour of the genome is, finally, Wilson’s argument for a conservation ethic. An organism’s “ethical value” is “substantiated by close examination of its biology” (2003: 131).

Fiction or Reality?

Wilson’s abiding conviction – which, I would argue, is shared by many in the Epic of Evolution/Universe Story movement – is that sheer accumulation and recitation of information about the natural world will somehow evoke wonder, and thus care and concern. Put differently, Wilson’s key argument for valuing nature is that much of its “scientific information” or “biological wealth” is simply being lost through extinction, before it can be “mapped” and “counted” (2010: 347). The quest to catalogue all of the world’s biodiversity will take on a kind of religious significance, he predicts, leading to the “transcendent and only dimly foreseeable complexity of future biology.” In this transcendent realm of future biology, humans – or, at least, the biologists in our midst – will discover a “*new theater of spiritual energy*,” Wilson assures us (2007: 109, emphasis mine). As he draws out this implicit comparison between the great spiritual potential of future knowledge, vis-à-vis the waning attractions of traditional religion, his plea for nature is strangely muted. The result is that works such as *The Creation* often read less as an appeal to save the natural world than as “an evangelical tract for Wilson’s greater cause of consilience” – the final unification of all knowledge (Stoll: 344).

And yet in *Anthill*, the novel’s ecologist-narrator defends firsthand encounters with nature in terms that unmistakably echo Wilson’s own remarks to the Aspen Environmental Forum. Norville’s full-throated and passionate endorsement of the “full reality” of frog treats nature as “more real” than the classroom or laboratory:

To learn a frog in a full and lasting manner, you must find one where it lives in nature, watch it, listen to it if it is calling . . . The concept of frog will be with you forever if you follow this kind of education. You can pick up additional information from science and literature and myth, and all those things you have at school, but you will be wiser for being rooted in the full reality of frog. You will care about frog, too, like nobody else (2011: 124).

Wilson's allusion in *Anthill* to nature's full reality – “nature [as] the real world” (2011: 140) – and to the solid moral foundation provided by sensory encounters in nature is strongly resonant of Rachel Carson's philosophy. Here he even casts science in a supporting role as mere “additional information” picked up in formal schooling. Yet the mature *scientist* Wilson seems often to neglect the concept of frog in its fullness and sensory reality. Does Wilson believe that the perception of nature as ultimate reality is appropriate only for children – or perhaps, only in works of fiction?

In fact, Wilson was a latecomer to environmentalism. Nature provided comfort and peace during some troubled childhood years, but he first recalls having become engaged in environmental issues in 1979 – at about age 50 – when he encountered alarming reports of rainforest destruction (Wilson 2006). Since the 1990s, Wilson has come to be seen as an ardent defender of nature, a kindred spirit of Rachel Carson. Yet his position would seem to be that direct sensory engagement with nature of the sort advocated by nature-study is merely a means to an end, a necessary but juvenile – and indeed *savage* – stage passed through on the way to a mature, rational (civilized?) form of wonder at scientific explanation. In this respect, though he seems to allow untutored, imaginative experiences of nature as a primitive prerogative of youth, Wilson's thinking is not so far removed from Dawkins.

Conclusion

Whether partial or complete, this eclipse of nature is a troubling feature of both scientists' efforts to communicate the value and significance of scientific discovery to the broader public. For Wilson and Dawkins, habitual immersion in the values and culture of science leaves them in a poor position to articulate what, if anything, is uniquely valuable and real about *nature*, apart from our scientific apprehension of its workings. Perhaps the important lesson to be drawn, then, is that writers like Wilson and Dawkins who are deeply invested in celebrating the superiority of scientific wonder, and the eventual triumph of science over religion, do not always make the best advocates for *nature*, least of all for an audience of children.

Bibliography

Adams, Tim

- 2010 “Anthill: A Six-Legged Adventure from Science to Fiction: How Leading Biologist EO Wilson Turned his Passion for Ants into a Best-Selling Novel.” *The Guardian* (June 5). Available online at <http://www.theguardian.com/science/2010/jun/06/biology-wilson-anthill-bestseller>.

Armitage, Kevin

- 2009 *The Nature Study Movement: The Forgotten Popularizer of America's Conservation Ethic*. Lawrence: University Press of Kansas.

Attenborough, David, and Richard Dawkins

- 2010 “Of Mind and Matter: David Attenborough Meets Richard Dawkins.” *The Guardian* (September 10). Available online at <http://www.theguardian.com/science/2010/sep/11/science-david-attenborough-richard-dawkins>.

Bailey, Liberty Hyde

1904 *The Nature Study Idea*. New York: Doubleday.

Barlow, Connie

n.d. "Order of Service Suggestions for Stardust Intergenerational UU Service." Available online at <http://thegreatstory.org/stardust-service.html>.

Beckford, Martin, and Urmee Khan

2008 "Harry Potter Fails to Cast Spell Over Professor Richard Dawkins." *The Telegraph* (October 24). Available online at <http://www.telegraph.co.uk/news/3255972/Harry-Potter-fails-to-cast-spell-over-Professor-Richard-Dawkins.html>.

Berry, Thomas

1978 *The New Story*. Teilhard Studies 1. Woodbridge: American Teilhard Association.

Carson, Rachel

1965 *The Sense of Wonder*. New York: Harper and Row.

Dawkins, Richard.

1991 "Growing Up in the Universe." Royal Institution's Christmas Lectures Part 1. Video available online at <http://www.youtube.com/watch?v=eYb-c4mavzM>.

1998 *Unweaving the Rainbow*. Boston: Houghton Mifflin.

2003a "Good and Bad Reasons for Believing." Pp. 242-48 in *A Devil's Chaplain: Reflections on Hope, Lies, Science, and Love*. Boston: Houghton Mifflin.

2003b "I Speak of Africa and Golden Joys." P.231-33 in *A Devil's Chaplain: Reflections on Hope, Lies, Science, and Love*. Boston: Houghton Mifflin.

2009 "Growing up in Ethology." *Edge* (December 17). Available online at http://edge.org/3rd_culture/dawkins09.1/dawkins09.1_index.html.

2011 *The Magic of Reality: How We Know What's Really True*. New York: Free Press.

2012 "Is Science a Religion?" P. 566 in *Philosophy of Religion: An Anthology*. Edited by Louis J. Pojman and Michael Rea. Boston: Wadsworth.

Dickens, Charles

2003 *Hard Times* [1854]. London: Penguin Classics.

Dowd, Michael

2009 *Thank God for Evolution: How the Marriage of Science and Religion Will Transform Your Life and Our World*. New York: Penguin Group.

Dowd, Michael, and Connie Barlow

2011 "The Magic of Reality – An inside Look at Richard Dawkins' First Children's Book." Video available online at <http://www.youtube.com/watch?v=CcOwS8EFSou>.

The Great Story

- n.d. "Evolutionary Curricula for Children and Youth." Available online at <http://www.thegreatstory.org/kids.html>.

Hall, Stephen S.

- 2005 "Darwin's Rottweiler. Sir Richard Dawkins: Evolution's Fiercest Champion, Far Too Fierce." *Discover Magazine* (September 8). Available online at <http://discovermagazine.com/2005/sep/darwins-rottweiler>.

Hymas, Lisa

- 2008 "E. O. Wilson Calls for Kids to be Set Free Outside, Scripted Activities be Damned." *Grist* (April 2). Available online at <http://grist.org/article/aspen-envt-forum-soccer-moms-are-the-enemy-of-biological-education>.

Louv, Richard

- 2005 *Last Child in the Woods: Saving Our Children from Nature Deficit Disorder*. Chapel Hill: Algonquin Books.

Nicholas, Elizabeth

- 2012 "The Aspen Environment Forum Launches with E.O. Wilson and Stewart Brand." *The Aspen Institute* (June 23). Available online at <http://www.aspeninstitute.org/about/blog/aspen-environment-forum-launches-co-wilson-stewart-brand>.

Sideris, Lisa H.

- 2013 "Science as Sacred Myth? Ecospirituality in the Anthropocene Age." Pp 147-62 in *Linking Ecology and Ethics for a Changing World: Values, Philosophy, and Action*. Edited by Ricardo Rozzi, S. T. A. Pickett, C. Palmer, J. J. Armesto, and B. Callicott. New York: Springer.

Stoll, Mark

- 2009 "Edward Osborne Wilson." Pp. 333-48 in *Eminent Lives in Twentieth Century Science and Religion*. Edited by Nicholas K. Rupke. Frankfurt: Peter Lang.

Wilson, Edward O.

- 1978 *On Human Nature*. Cambridge: Harvard University Press.
- 1999 *Consilience: The Unity of Knowledge*. New York: Vintage.
- 2003 *Future of Life*. New York: Vintage.
- 2006 *Naturalist*. New York: Island.
- 2007 *The Creation: An Appeal to Save Life on Earth*. New York: W. W. Norton & Company.
- 2010 *The Diversity of Life*. New York: W. W. Norton & Company.
- 2011 *Anthill: A Novel*. New York: W. W. Norton & Company.