

SCIENCECHRONICLES

December 2012

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Essay

An Environmental Scientist Reads Rachel Carson's *Silent Spring*

By [Jeff Opperman](#), senior freshwater scientist, Great Rivers Partnership, The Nature Conservancy



When I was asked how the environmental classic *Silent Spring* had affected me, I had to admit — somewhat self-consciously — that I had never read the book. For someone whose career is conservation, this deficit is somewhat akin to being a decade and a half out of seminary and confessing to having somehow overlooked the Gospels.

I was certainly aware of *Silent Spring* and knew that its release was one of the iconic moments, alongside the Santa Barbara oil spill and the Cuyahoga River fire, that galvanized the modern environmental movement. I thought of it as an important, but dusty, artifact; the book's target — the widespread spraying of DDT and other toxins — was long-ago banned in the United States, and then in much of the world, in large part due to Carson's book. So to me, its own success marked *Silent Spring* as more an event to celebrate than a book to read. I was content to let the historians summarize its key points and value.

Image: Rachel Carson National Wildlife Refuge, Maine, USA.
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But with a little prompting from my employer and a summer vacation on deck, I decided to dive deep into *Silent Spring*.

As I progressed through the 300-page tome, I realized that my preconceptions were at least partly right: much of the book does feel dated. To build the factual foundation to support her case, Carson provides exhaustive detail of various spraying programs, such as their cost, acreage sprayed, and impacts both quantitative and anecdotal. But since her book galvanized change decades ago, these comprehensive details now seem long and repetitive and suggest the value of a good summary as substitute.

Carson brackets this detail, however, with crisp prose and vivid imagery, and reading *Silent Spring* first-hand exposes you to the beauty of her writing. For example, she elevates a scientifically dense discussion of cellular respiration with a whimsical description of mitochondria (the cellular components that convert sugar into ATP, the body's currency of energy) as "billions of gently burning little fires that spark the energy of life." She describes the fires as being stoked by a cyclic process, like a wheel, and the dangerous, and largely unstudied chemicals, as a "crowbar to wreck the wheels" of cellular life.

So while much of the basic reporting shows its age, overall, her prose rings true. This dichotomy underscores the key to *Silent Spring's* success. Carson wielded two weapons — scientific fact and rhetorical art — and it was her deftness with words that sealed the book's impact and its legacy. Data are just numbers until someone breathes life into them and conjures a coherent, compelling story.

Carson's words also reveal her deep love of nature. Though she discusses the implications of toxins for human health and anticipates utilitarian concepts such as ecosystem services, *Silent Spring* is underlain by a nature that transcends material well-being; it is the fundamental source of inspiration and refuge. After all, she didn't name her book *Poisons from the Sky*, or *Deadly Spring*, but *Silent Spring*.

Her title suggests that even if we could fine-tune our applications of pesticide to eliminate direct human health impacts, chemistry could never provide better living if it cost us the birds' morning chorus.

This perspective, too, gives *Silent Spring* relevance beyond DDT and speaks to today's crises and choices. In the first chapter Carson writes, "For time is the essential ingredient; but in the modern world there is no time." By this she meant that our headlong rush to launch chemicals into the field of battle with insects gave no time for the unintended targets — birds, fish — to evolve resistance to these new threats.

But I read those words — "In the modern world there is no time" — while trying to unplug and unwind and they struck a different chord. In her impassioned plea for fields and forests still filled with bird song, Carson was fighting to maintain nature — unruly,

"You may want to spend some time with this towering figure and experience first-hand her prose and insights. Then again, 300 pages filled with copious detail on specific spraying programs and cellular metabolism may knock *Silent Spring* way down, or even off, your 'to-read' list."

unpredictable, diverse and wonderful — as an ever-present sanctuary in a world that seems to ratchet ever-onward toward the distracted, frenetic, and fragmented.

How did reading *Silent Spring* affect me? Well I certainly came away with a profound respect for Carson's courage, intellect and writing skill. But I realize that this is a decidedly mixed review of the book. You may want to spend some time with this towering figure and experience first-hand her prose and insights. Then again, 300 pages filled with copious detail on specific spraying programs and cellular metabolism may knock *Silent Spring* way down, or even off, your "to-read" list.

I have a suggestion: Start with Carson's *The Sense of Wonder*. This is a delightful and brief book (it took me less than an hour to read) that interweaves Carson's contemplations on the value of nature with beautiful photographs by Nick Kelsh. Both the photographs and contemplations bring to life the forests and [rocky shores of the Maine coast where Carson shared her love of nature](#) with her grandnephew Roger (who she would later adopt when his mother died at the age of 31).

The Sense of Wonder is a celebration of the full sweep of nature — from the minute to the grand — and is an invitation to adults to rekindle a relationship to rocks, water, bugs and stars they may have had once but lost somewhere along the way. Introducing a child to that lost world is the surest path back:

A child's world is fresh and new and beautiful, full of wonder and excitement. It is our misfortune that for most of us that clear-eyed vision, that true instinct for what is beautiful and awe-inspiring, is dimmed and even lost before we reach adulthood...I should ask that [each child should receive] a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation from our source of strength.

The Sense of Wonder can be just an appetizer for *Silent Spring*, or it can stand alone. While *Silent Spring* was a letter to the world that changed the world, *The Sense of Wonder* feels like a letter written to you. **SC**

Fiction

Touching Them All

***The Art of Fielding: A Novel.* By Chad Harbach. Back Bay Books, 2012. 544 pages.**

Reviewed by Jen Newlin, senior creative manager for marketing, Western U.S. Division, The Nature Conservancy

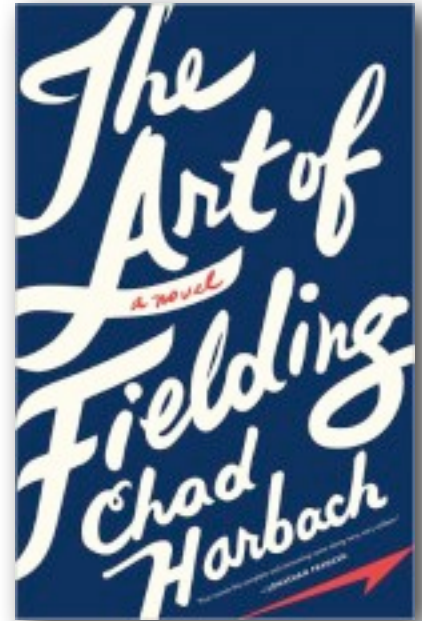
Remember when the St. Louis Cardinals' Matt Holliday slammed into the San Francisco Giants' Marco Scutaro at second during the 2012 Major League Baseball postseason? A soccer-esque slide built to take the man out? And everyone gasped, booed and wondered about retaliation?

There's honor and code in baseball (if you ignore the dugout spitting). A soft, slow pace that, when upset, is scandalous. So is built Chad Harbach's novel, *The Art of Fielding*. It's about baseball, but also — in the same soft, chivalrous dance — is about relationships, ambition and anguish.

It's a book I loved and bemoaned at the same time. Beautifully written, but with a plot I didn't want to watch unfold. (Like watching that video of Buster Posey's leg injury at home plate. Good God.) The novel's shortstop star, Henry Skrimshander, a scrawny underdog we all adore, begins to battle self-doubt. And we hate it. We know he can field. But does he?

Meanwhile Henry's warm, well-groomed roommate (who's also on the Harpooner's college baseball team) begins an off-limit romance. And his wingman, Mike Schwartz, the stout team captain who has fashioned Skrim into big league material, faces the doubts of others. Throw in a young woman, reclaiming her life after a failed marriage. And her father, the college president, in his wood paneled office/house and pocket full of secrets.

Did I like the book? I think so. Yes: the beautiful sentences. The writing that mirrors baseball's traditional, quiet culture. Yes: the characters we want on our team. No: to some messy plot decisions at the end. But it's a fast-paced paperback, smoothly constructed. And with that lovely cover design? I'll step up to bat for it any day. **SC**



Fiction

Flowing Downhill

***Pompeii: A Novel.* By Robert Harris. Random House, 2005. 304 pages.**

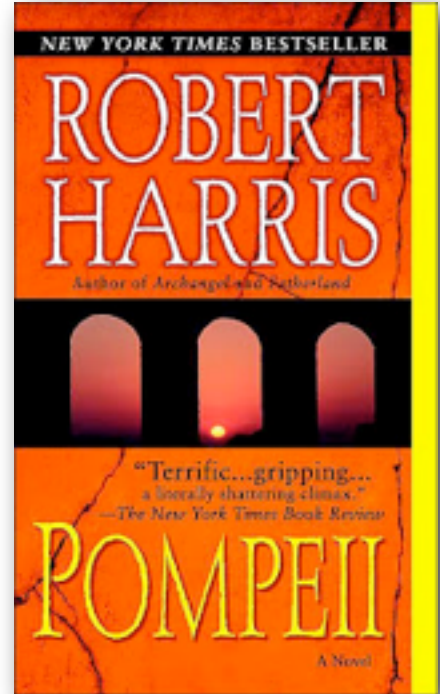
Reviewed by [Craig Leisher](#), senior social scientist, The Nature Conservancy

The pyramids in Egypt, the canals surrounding Angkor Wat in Cambodia, and the Temple of the Sun in Peru are monumental engineering feats of the ancient world still evident today. But these pale in comparison to what the Roman Empire did with aqueducts.

In the historical novel *Pompeii*, Marcus Attilius Primus is the *aquarius* (water boss) of the aqueduct that supplies water to the Roman cities near Mount Vesuvius. It's a tale of Roman water supply, Pliny the Elder's legendary learning, and volcanology. You know how it ends because it is *that* Pompeii.

It's the details about Roman aqueducts that surprise most. Imagine a brick and waterproof cement pipeline large enough to walk in, but that runs for more than 100 miles and spans rivers and tunnels through hills, powered by nothing but the gentle slope of a 1-foot decline every 4,800 feet and durable enough to last for 1,000 years. Imagine valves to control flow, water cisterns the size of stadiums to regulate the water flow, and enough water to supply homes, public fountains, baths and even the brackish aquaculture of red mullet — a fish worth its weight in silver to the Romans.

Protection of the water sources was vital to urban life in the Roman Empire, and the city water authorities paid people to protect the upstream water sources. Sound familiar? Most cities in the Roman Empire had water funds; they just didn't know it. **SC**



Fiction

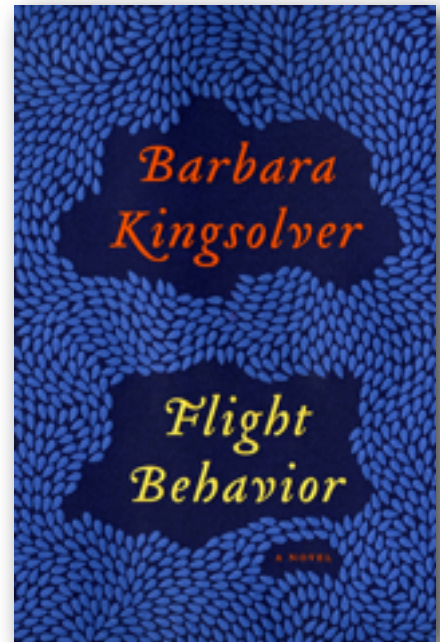
What We Talk About When We Don't Talk About Climate Change

Flight Behavior: A Novel. By Barbara Kingsolver. Harper, 2012. 448 pages.

Reviewed by [Sally Palmer](#), director of conservation science, The Nature Conservancy in Tennessee

During my evening commute a few weeks ago — receiving NPR and emitting 30 lbs of CO₂ — I heard the beginning of an interview with Barbara Kingsolver about her “new novel about climate change...set in East Tennessee.” I shut the radio off immediately and bought a copy of *Flight Behavior* on my e-reader as soon as I got home.

I'll refrain from revealing specifics about the ecological phenomenon that Kingsolver imagines into being — other than to say it resonated with me. The protagonist of the story, Dellarobia Turnbow, is a woman in her late 20s with two young children who feels trapped in a marriage that originated in a teenage pregnancy and has led her to a life on her in-laws' farm where she's made to feel like a permanent outsider. Dellarobia is the first person to witness the phenomenon as she hikes up the mountainside behind her home with a particular type of escapist behavior in mind. The sight she sees on the mountain sparks an immediate awakening inside her. She shares what she's seen with her family, and news of what's happened at the Turnbow farm soon passes around their small community. Within a short span of time, the news goes global, inviting a whole host of observers from all sorts of geographies to descend upon Feathertown, Tennessee.



The persistence of this strange, seemingly unexplainable happening begins to expose the gaps in how different characters from different circumstances choose to interpret and place value on what they see. In interviews I've read since abandoning that initial radio story, Ms. Kingsolver has pointed to these gaps as one of her major interests in writing a novel about climate change. In her words, dealing with climate change seems to be “the largest non-conversation” we're having with one another right now. Why is that? What is it about human behavior that contributes to the absence of productive dialogue? Ms. Kingsolver doesn't claim to answer these questions, but instead creates a context and characters that allow us to ponder them. I encourage you to spend some time with *Flight Behavior*, walk alongside Dellarobia, and see the world as it changes through her eyes.

SC

Fiction

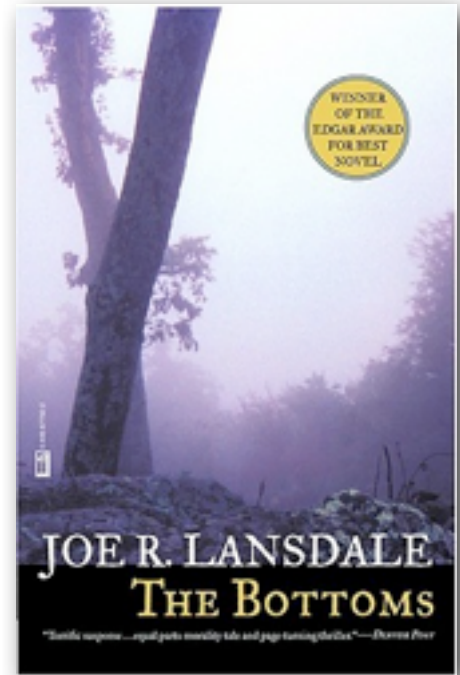
Low Country

***The Bottoms: A Novel.* By Joe Lansdale. Vintage Books, 2000. 336 pages.**

Reviewed by [Peter Kareiva](#), chief scientist, The Nature Conservancy

When I tell you this book is about murder and race during the depression in East Texas, I bet you are not thinking, “what a great holiday book to buy.” But this is the best fiction I have read this year. *The Bottoms* is *To Kill A Mockingbird* with a rough edge and better dialogue.

The story is told through the eyes of a young boy witnessing it all, and trying to make sense of the darker side of people. Ethnic hatred and racism is still very much a part of our world. *The Bottoms* gives one hope that it need not always be that way, but without any sugar-coating and with a piercing rendition of what it means when someone does not see another human as a person. Mixed in with the mystery and violence is humor and one of the best fictional characters I have ever come across. **SC**



Fiction

Read It and Leap

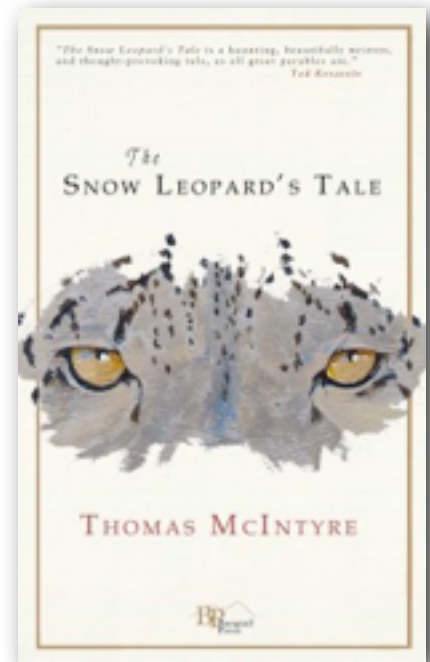
***The Snow Leopard's Tale*. By Thomas McIntyre. Bangtail Press, 2012. 130 pages.**

Reviewed by [Matt Miller](#), senior science writer, The Nature Conservancy

I once thought that any book with “snow leopard” in its title would inevitably be compared, unfavorably, to Peter Matthiessen’s travel writing masterpiece *The Snow Leopard*. I was wrong. Thomas McIntyre has crafted a surreal, taut parable of wildness and civilization, an utterly original work that I can’t compare to anything I’ve read.

This is a tale of an other-worldly chance encounter between a snow leopard and a Central Asian herder. That meeting results in the snow leopard seeing the world through the man’s eyes — or is it the other way around? The man-beast journeys to the city, an environment utterly nonsensical and barbaric by snow leopard standards. I frequently found myself lingering on passages, enjoying the author’s mastery of language and keen observations of both the human and the animal.

But beyond the words, the book left me with an urge: to flee my desk, lope into the mountains and chase large beasts. Admittedly, I don’t need much provocation for such thoughts. If you’re the same, if you love and live for wildness, buy this book. You won’t be disappointed. **SC**



Fiction

So Nice, We Reviewed It Twice

1Q84: A Novel. By Haruki Murakami. Knopf, 2011. 944 pages.

Reviewed by [Silvia Benitez](#), conservation projects manager and ecosystem services coordinator, Northern Andes, The Nature Conservancy, and [Charles Bedford](#), Asia regional managing director, The Nature Conservancy

This novel is located in Tokyo in 1984, and tells the story of two young Japanese characters (Tengo and Amomame) who, even though they live separate lives, are connected by the fact that they both live in a subtle alternative world. (As Amomame says, they are not living in 1984, but in 1Q84.) Using this parallelism with Orwell's *1984*, Murakami tells the adventures of this couple through April to December of that year in three books. Both are also lonely characters who are hiding something: Amomame, a gym instructor, has a second life as a murderer of abusive men; Tengo, a math instructor and writer, secretly re-writes a manuscript of the novel *Air Chrysalis* (written in the novel by the enigmatic teenager Fukaeri), and *Air Chrysalis* becomes a best-seller after the rewritten manuscript wins a contest. The history will take you through mysterious roads trying to solve other secrets — those behind a religious movement, strange creatures called “little people,” murder, persecution, and Tengo and Amomame trying to find each other.



1Q84 may seem too long at first glance, but the reading flows so easily that you will be glad to have a book that can accompany you on the plane, for those long waiting hours at the airport, or just when you want to relax and disconnect from work. Good long books that flow easily are my favorites because they can keep me company for some time, during which I can deeply live the story. Murakami is a master at character development, and you get to know Tengo and Amomame very closely through their thoughts, feelings and fears. It has been several months since I finished the book, but I'm still reminded of the young couple when I see a slide on a playground, eat miso soup, or when I look at the moon breaking free of clouds. **SC**

—Silvia Benitez

1Q84 grabbed my attention like a spy thriller, but kept me focused (for 928 pages!) because of the fantastic story and rich texture that Murakami weaves about contemporary Japan. The nominal plot line, in which the hero and heroine are separated after a wordless but powerful connection as 4th graders and pine for each other ever after, ties a remarkable set of parallel real and fantasy worlds together that explore death, love, sex, cults, art and culture.

The characters are beautifully rendered as though in a painting or close up photo of an emoting face. Some reviewers felt that this character development and length was self-indulgent of the author, but the degree of engagement that this approach vests in the reader is powerful. All of this craftsmanship is echoed in the plot, in which one of the protagonists is carefully crafting a novel dictated by a dyslexic 17-year-old that he believes will change the world, and serves to heighten one of the underlying themes of the novel — our ability to overcome and recover from emotional injuries through writing and creation of other worlds.

One of the great devices of the novel is a naturalistic one. An air chrysalis, a covering made by plucking threads out of thin air, allows for the passage from one painful world to another that is less so. It's a beautiful metaphor laid out as a wild reality. The book reminds me of *Life of Pi* in its conscious reference to the mind's ability to create its own reality, and then to make a choice which reality to embrace.

The fantastic world, as opposed to the normal one, is the scene for most of the novel, but it is to the normal world that the characters are able to return in the end. So is there another world, or is it just an illusion? Is the illusion able to be seen by others? Is it a filter on our eyes? Or just another fine and valid reality that we can choose to exist within? The founder of the Sakigake cult has created an illusion under which all of his followers dwell; its grotesque ecosystem is woven around him in bizarre ways. He finds himself ultimately begging for deliverance from the pain of living in his own abomination. It seems that a painful catharsis is required for all of the characters to return to an objective "reality." Perhaps this is Murakami's lesson for us. **SC**

—Charles Bedford

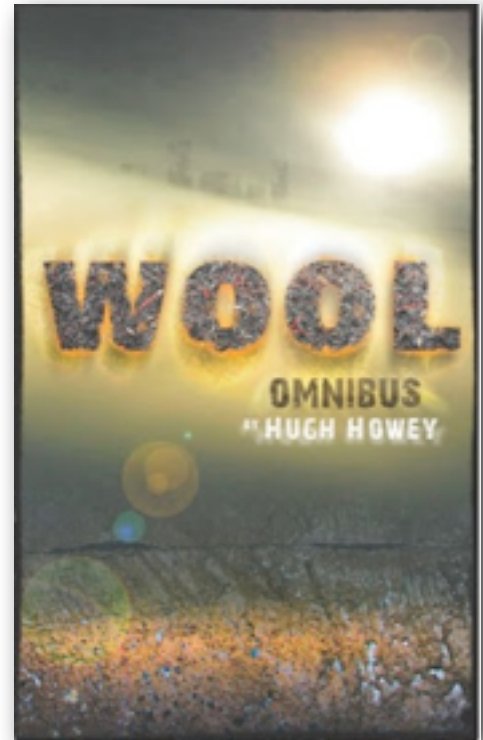
Sci-Fi/Fantasy Sheep Thrills

***Wool Omnibus: A Novel.* By Hugh Howey. Kindle Direct Publishing or paper, 2012. 550 pages.**

Reviewed by [Peter Kareiva](#), chief scientist, The Nature Conservancy

A college dropout buys himself a sail boat, bums around the Caribbean, and then ends up being a commercially successful writer by self-publishing *Wool* without the assistance of agents or a publishing house. How does he do it? He writes a terrific story, that's how.

Wool is about humans living underground in a giant silo-like container, unable to venture up onto the surface of a destroyed planet. Have you ever felt cooped up and desperate to get outdoors? Multiply that by 1,000 and you have some sense of the claustrophobia with which this book makes you cringe. But it is not the sci-fi mystery or soul-crushing setting that makes *Wool* work — it's the terrific characters, and the stories of love, murder, betrayal, collusion and inspiration. This is one of those few books that sucks you in, and you do not want to leave, even though the world it portrays has no beauty or appeal.



While it is classified as science fiction, I never felt like I was reading a sci-fi story. Maybe that is because living in a silo with a rigid hierarchy is perhaps not so different than working in today's world, with endless meetings in windowless conference rooms that sometimes start when it is dark and end when it is dark. I worry my description of *Wool* make it sound depressing. It is not, I promise you. When the in-laws descend on you for the holidays and you just want to escape for a few hours, and escape so well nothing can intrude, this is the book to buy and read. **SC**

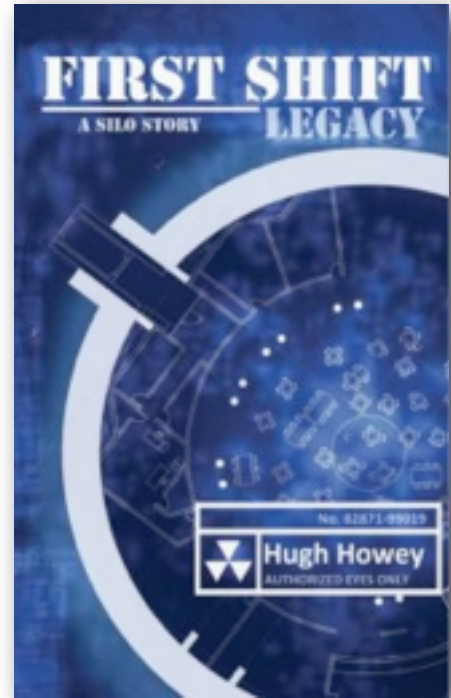
Sci-Fi/Fantasy Get Siloed

***First Shift: Legacy (A Novel)*. By Hugh Howey. Broad Reach Publishing (through Amazon Digital Services), 2012. 238 pages.**

Reviewed by [Tim Boucher](#), senior conservation geographer, The Nature Conservancy

After reading the brilliant *Wool Omnibus* (see Peter Kareiva's review on the previous page), I wondered if Hugh Howey could maintain the same level of writing in *First Shift*. Would it enthrall as did the "Wool" series?

Yes, it did. Absolutely. It is just as well-written, just as intriguing and engaging. *First Shift* is both the prequel and the parallel story to *Wool Omnibus* (which should be read first) in what is now called the "Silo Series." Unlike some prequels (and parallels) that are cop-outs in that they don't add to add anything to the original story, this book enriches the entire series, answers nagging questions, and sets the stage for more to come. I loved the way Howey wove the chapters together, jumping from past to present, presenting characters in both, only to tie them together at the end, in both subtle and sad ways. What is most frightening about the Silo Series is that the technology is already in place in our world, both for the silos to exist and for the poisoning of planet. This is not far-fetched plot; it's real, and that's a scary thing — that it would not take too much to carry out. I am going stick my neck out here and opine that the Silo Series will eventually be judged as on par with Asimov's "Foundation" and "Robot" series. It is a classic in the making. *Second Shift* is already on my eReader. I read *Wool* too fast. I am now going to take my time with this epic. **SC**



Sci-Fi/Fantasy

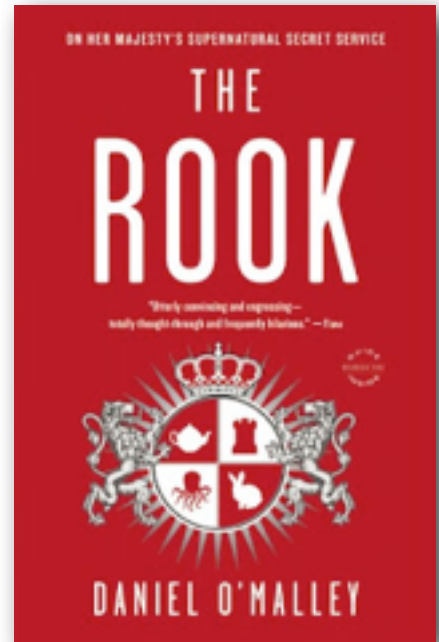
When Phoning Sir Harry Pearce Won't Suffice

***The Rook: A Novel.* By Daniel O'Malley. Back Bay Books, 2012. 512 pages.**

Reviewed by [Susanna Danner](#), director of protection, The Nature Conservancy in Idaho

You would think that Great Britain would be well protected against its fictional threats by Luther, Bond and Holmes. But even 007 might quail if faced with an immense ectoplasmic taruca. Colonist Nate Silver would stumble in his prognostications if he knew that "15 percent of all men wearing hats are concealing horns." There are some problems that might damage even Sir Harry Pearce's calm. Luckily for all of them, there is a shadowy agency preserving the realm: Her Majesty's *Supernatural Secret Service*.

In the England of *The Rook*, it takes the Checquy, an ancient court in service to the nation, to address supernatural threats that MI-5 and 6 can't abate. Unlike MI-5, in the Checquy, some of the spooks are actual spooks. *The Rook* begins as one of the highest-ranking officers of the Checquy regains consciousness in a muddy park, surrounded by the dead bodies of her attackers wearing latex gloves, and without her memory. When she finds a note in her pocket from the former inhabitant of her brain, she discovers that she was betrayed by another member of the court. Furthermore, she realizes she has bizarre powers that she doesn't understand and must learn to control. The story unspools from there, as our heroine must figure out who is the traitor within, while deadly, paranormal threats burgeon without. **SC**



Sci-Fi/Fantasy

Magic! Demons! Love! Revenge!

***The Name of the Wind: A Novel.* By Patrick Rothfuss. Daw Books, 2007. 662 pages.**

Reviewed by [Peter Kareiva](#), chief scientist, The Nature Conservancy

Ever since *The Lord of The Rings*, fantasy has gone mainstream and has provided a wonderful shared reading experience for whole generations of readers. That said, I have never been able to return to the fantasy genre since my younger teenage years. *The Name of the Wind* changed that — it is the most adult and engaging fantasy book I have ever read.

Because it is told in the hero's voice, it can be wry and sad and arrogant at the same time, and it draws you in personally as he tells his tale. You will recognize the story as one of the classic themes underlying all epics, but it is interwoven with digressions about everything from human psychology to the nature of jealousy and friendship and even academia. This is the perfect book for a glass of mulled wine, a deep leather chair, a dark winter afternoon, and a need to escape the holiday cash registers. And I have always had a deep attraction to stories of magic and demons — why else would one embark on a career as a scientist?

This is the first of a trilogy — so if you like *The Name of the Wind*, you have some more lost evenings to look forward to. **SC**



Sci-Fi/Fantasy

Reading This Review Could Kill You

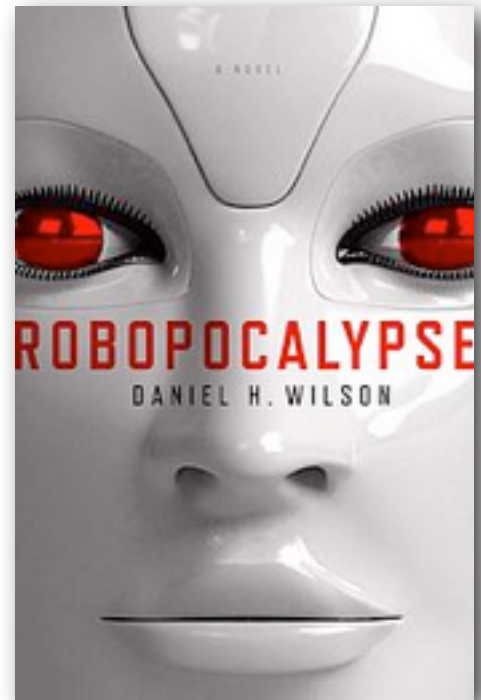
***Robocalypse: A Novel.* By Daniel H. Wilson. Vintage, 2012. 416 pages.**

Reviewed by [Susanna Danner](#), director of protection, The Nature Conservancy in Idaho

What are the job prospects for a nerd? For you, lucky reader, it's to work for The Nature Conservancy. But what about for less fortunate nerds? If you're a Porifera biologist, you become the creator of SpongeBob SquarePants. If you're a stargazer, you create a skyscraper and land Curiosity on Mars. But what about if you're just a PhD roboticist? Breakdance instructor? Campaign speechwriter? Barista?

No. You write one of the best apocalypse books ever penned. Wilson is that roboticist, and *Robocalypse* is that book.

Like me, I'm sure you are enjoying the many zombie-related apocalypse stories shambling through the zeitgeist of late. Sure, "The Walking Dead," *World War Z*, and *Zone One* are snappy. But none of those perils measure up even a little bit to the scariness of a robot apocalypse. To defeat a zombie, you just need a knife, or, in a pinch, a chainsaw arm. How do you defeat a worldwide, networked AI? All our networking may help us communicate, but it also helps the robot hive mind to infiltrate our every defense. Do you remember DARPA's nano-hummingbird from last year? That is the least of our problems. Chuck the Three Laws of Robotics out of the window: cars, radios, toys, computerized HVAC systems — they all become our assailants in the Robot War. They use our security cameras, our conversations on Skype, and our motion detectors against us. Because Wilson knows the science behind robotics, his description of our malevolent overlords chills the blood. I'm beginning to think that Admiral Adama had the right idea: I'm just going to switch my webcam off, start driving a Dodge Dart, and revert to a rotary dial phone now. For your sake, I hope you are reading this copy of *Science Chronicles* on parchment. If you are reading it online, it was nice knowing you. **SC**



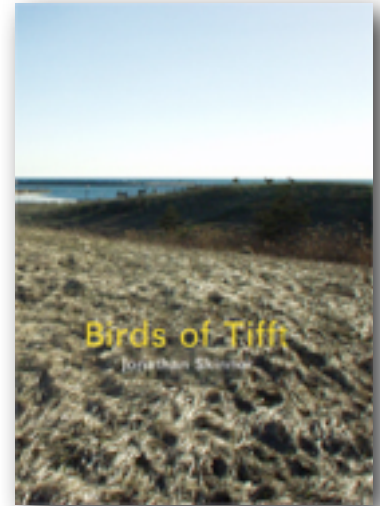
Poetry

The Songs of Novel Ecosystems

Birds of Tifft. By Jonathan Skinner. BlazeVOX Books, 2011. 120 pages.

Reviewed by [E.J. McAdams](#), associate director of philanthropy, The Nature Conservancy in New York

Just as The Nature Conservancy has evolved over the last decade in its understanding of nature and its relationship to human beings, so has literary culture, especially poetry. There is a new movement away from “nature poetry” toward “ecopoetics,” and one of the guiding lights in this evolution is the poet and founder of the journal *ecopoetics* (<http://ecopoetics.wordpress.com/>), Jonathan Skinner. Poets like Skinner are exploring landscapes that were previously neglected and assumed devoid of ecological value or beauty, like the Tifft Farm Nature Preserve in Buffalo, around which he builds his book *Birds of Tifft*.



Skinner is a true naturalist, and you will find attentive descriptions of the natural world that include human impacts and humor:

old upended bottle
mr. muskrat
cleaning his ears

among the bulrushes

alpenglow
on General Mills
pink behind larches

rustle honk
trill whirr
shree splash

no. 5 whines and roars

(from “Tifft Log,” page 13)

To bring in the history of this place, including its industrial past, Skinner uses other tools in addition to the expected poetic tools like rhyme and rhythm. These include appropriation of other texts not his own, maps, photos, and (one of the highlights of this

book) a kind of concrete, ethnopoetic word-map of Tifft called “Ropy World” that is surprising in its indeterminate form — basically a reader has to tackle the poem like a hiker in an unknown landscape.

One of results of Skinner’s walks at Tifft is not the enraptured loss of self that you find in much nature poetry, but instead something more humble: “proportion’s restored / to think with others...” (page 47) Obviously, if we want more successful outcomes for the planet, we need to do a lot more (and better) thinking with others.

As the Conservancy ventures out into urban conservation and conservation for people, Skinner’s *Birds of Tifft* should be essential reading to understand the ethical contradictions and beauty in these human-impacted landscapes. **SC**

Food Fully Baked

***Home Baking: The Artful Mix of Flour and Traditions from Around the World.* By Jeffrey Alford and Naomi Duguid. Artisan, 2003. 448 pages.**

Reviewed by [Jensen Montambault](#), applied conservation scientist, The Nature Conservancy

“Who is Wendy’s biggest competitor?” would ask the late Dave Thomas, CEO of that large hamburger restaurant chain. The typical U.S. audience rattled off a list of alternative fast food chains — processed chicken, ketchup and various arrangements of fried potatoes abound. The punch-line? Fast-food’s biggest competitor, said Thomas, is... people eating at home.

That’s one of the stories of expansive agriculture, arguably one of conservation’s keen competitors, too. The 1950’s brought us “better living through chemistry,” leading many societies to embrace as a modern miracle the shelf-life of some preservative-laced breads, as well to develop an alarming dependence on a wildly industrialized supply chain. The confident approach to making daily bread and other baked goods that is gently described in this book is the quiet domestic defiance that could be a conservation alternative.



Mind you, this is not the Land Institute — no one is suggesting that this bread is baked from perennial grains harvested by cradle. But the authors do offer such as casual familiarity with grain, with spur-of-the-moment baking. There can be so little waste with home-made bread because of the flavor and the time management and meal planning that goes with the lifestyle.

Even if you are not interested in the conservation aspects of food-waste reduction and decentralized processing, this book is well worth the read and a good pouring over the rich photographs. The authors relate in glorious sympathy their conversations with street vendors in South Asia and bakers in small towns in Austria, recounting their economics, lifestyles and personal struggles to remain traditional, modern and solvent.

Best of all, they field test all their recipes in a normal home kitchen with easy-to-attain ingredients and substitutions — including, somehow, my own great-aunt’s signature prune-filled cookies. So enjoy — or share it with your favorite farmer, foodie or cultural wanderer. **SC**

Food

Big Ag-gravation

***Stuffed and Starved: The Hidden Battle for the World's Food System.* By Raj Patel. Melville House, 2008. 416 pages.**

Reviewed by [Matt Miller](#), senior science writer, The Nature Conservancy

Raj Patel has worked for the United Nations and World Bank, but he's also been tear-gassed for protesting those entities. One of the reasons he's become such a vocal critic is the global agricultural system, a system he dissects in *Stuffed and Starved*. The book covers a remarkable amount of ground as Patel describes an industrial agriculture paradigm that has left in its wake rural and urban poverty, ecological calamity, monoculture, farmer suicide, human and animal abuse and a world plagued by both starvation and obesity.

Patel argues that these problems stem from policy that benefits corporations while harming large numbers of people, particularly in the Global South. For instance, he believes U.S. farm policy has for decades undermined self-sufficiency and agricultural economies in developing nations, leading to poverty and starvation — while making grandiose claims about “feeding the world.” Food aid exists not to feed children in Africa but to ensure markets for surplus grain.

I suspect many will find Patel alarmist and overly negative, but I don't think that's quite fair. He's done his homework; he knows history and policy and culture. I wish I could place this book in the hands of all those who believe industrial agriculture is a solution to conservation challenges. You may not agree with Patel's arguments, but I think they're important arguments to address and discuss. **SC**



Food Eat Up

***The Windup Girl: A Novel.* By Paolo Bacigalupi. Night Shade Books, 2009. 359 pages.**

***The Seed Underground: A Growing Revolution to Save Food.* By Janisse Ray. Chelsea Green Publishing. 2012. 212 pages.**

Reviewed by [Sara Gottlieb](#), conservation planner, The Nature Conservancy in Georgia

Speculative fiction may be read either as fantasy or as cautionary tale. I tend to view it as the latter, taking the existing trajectory of society and our relationship with technology to a logical conclusion or an absurd extreme. Recent trends in organic/local/slow food are a reaction to the industrialization of food, an industry that has swelled to mind-boggling proportions over the past seven decades. The two books that are the subject of this review provide a startling contrast between two possible futures that may have you look at the grocery store in a whole new, more ominous light.

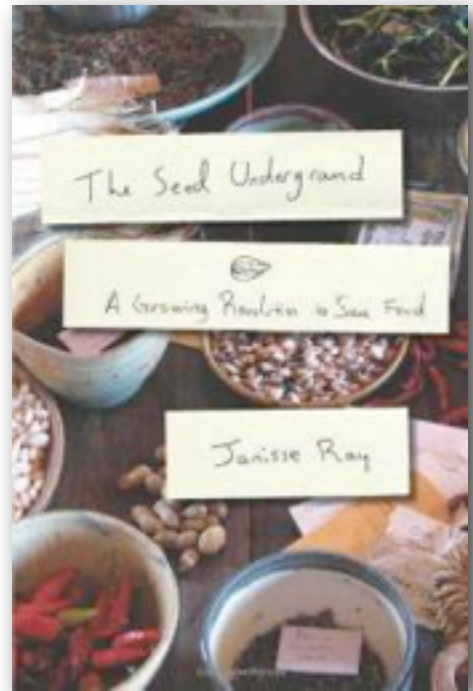
The Windup Girl is a genetically designed human who is accidentally unleashed in a post-climate-changed Thailand. The area is one of the few places in the world where people can live free of the fear of coastal inundation, thanks to pumps that run constantly; free of the fear of horrific food-borne diseases developed by genetic hackers, thanks to an army of government-controlled import inspectors. Fossil fuels are outlawed, except as licensed in controlled quantities to certain companies and essential government agencies. Work is accomplished by mahout-controlled genetically modified mammoth elephants, who turn spindles to store calories. Calories are controlled by a few agricultural biotechnology companies, which employ scientists to develop strains of seed that produce all the food anyone is able to obtain. Calorie companies also wage biological warfare against their competitors and anyone who tries to produce food from seed saved from traditional strains. Millions of people die horribly at the hands of the calorie companies in their quest for control and profit.

Just how close are we to an existence where the means of production are so thoroughly controlled in the hands of a very few companies which own the technology patents? Janisse Ray argues in *The Seed Underground* that we are within a generation of such a world, and that the key to avoiding this future rests on the conscious efforts of seed savers. Who would have thought that growing a garden plot where some plants are



allowed to go to seed — then harvesting, storing, and exchanging those seeds for varieties that can't be bought in catalogs — could now be considered a subversive act? Ray holds that such subversive activities, which seem quaint when practiced by my mother and her garden club friends, may indeed save us from a very undesirable future.

The cautionary tale of *The Windup Girl*, in contrast to Janisse Ray's informal network of seed savers and exchangers, should make us stop and think about the consequences of putting too much faith in technology to provide for our most basic needs. As we conservationists move from viewing agriculture as a threat to an opportunity or even a partner or funder, let's not blindly follow the promise that a technology-based industrial Green Revolution can indefinitely and benignly feed billions of urbanized people who have no clue about the consequences of such efficiency. **SC**



Food

You've Been Served

***An Economist Gets Lunch: New Rules for Everyday Foodies.* By Tyler Cowen. Dutton, 2012. 293 pages.**

Reviewed by [Bob Lalasz](#), director of science communications, The Nature Conservancy

Why old taxi drivers are the best way to find the best meals.

Why restaurants in low-rent strip malls with abandoned cars and customers who get into fights often serve the best food, and restaurants with great drinks and beautiful patrons serve the worst.

Why we need *more* agribusiness and consumerism — not less — to feed 9 billion and bring about global justice.

Why Michael Pollan, locavores, slow-foodists and anti-GMO crazies are making hunger and poverty and climate change worse.

Why Prohibition and allowing kids into restaurants killed American food, and why relaxing anti-immigration laws saved it.

Why you should try eating for a month only what you buy from a Chinese grocery store.

Why greener energy won't alone solve the climate crisis; why the United States will adopt a carbon tax (and Republicans will lead the way); why applying the animal cruelty laws we have for household pets to agribusiness could help save the planet; and why eating the most expensive version of any unsustainable food you can find would help, too.

Why you should always order the foulest sounding or most unknown thing on any menu.

Economics explains all these things. And Tyler Cowen, an economist at George Mason University, the founder of [the quite wonderful blog Marginal Revolution](#) and (most importantly) [the best food blogger in the Washington, DC area](#), lays it all out for you. You'll disagree, whine and scoff. But three pages of *An Economist Gets Lunch* are fresher and more stimulating than a year of Friedman, Krugman, Bittman, and Pollan put together. Sloppy thinkers about food and nature? You've been served. **SC**



People (and Animals) What Lady Gaga Can Teach Us

Language Intelligence: Lessons on Persuasion from Jesus, Shakespeare, Lincoln and Lady Gaga. By Joseph Romm. CreateSpace Independent Publishing Platform, 2012. 230 pages.

Reviewed by [Julie Morse](#), project ecologist, The Nature Conservancy in Washington

Truth is, if Joe Romm had left Lady Gaga out of the title. I never would have bought this book; the rest of those guys are so out of my league. But, I figured, if Lady Gaga and her poker face could master the art of persuasion, how hard could it be? (Plus, I just had to know: what on Earth do Jesus and Lady Gaga have in common?)

The answer, according to *Language Intelligence*, is annoyingly simple: rhetoric and repetition. Really? That's it?

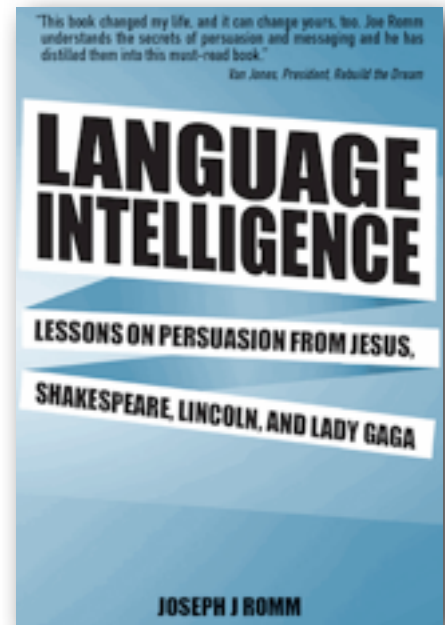
It would be nice to totally discredit Romm as just some whack job linguistic professor who is clueless about science communication. But that's hard, since he has a PhD in Physics from MIT, and he also happens to run Climate Progress, one of the most influential climate blogs out there. If your success metric is number of retweets, than Joe Romm is likely on the top.

Honestly, I can't say I liked *Language Intelligence* much; reading it is akin to having an itch you just can't reach, with periods of nails on a chalkboard thrown in. But enjoyment isn't really the point. To persuade, says Romm, use short words — slogans even — repeated again and again. (Think "new normal" instead of "shifting baselines.") This is everything our precise, sophisticated, and complicated science talk isn't. He even goes so far as to suggest you practice giving a talk using only one syllable words. Are you nuts?? What about estuaries, resiliency, and all my other science-y ~~terms~~ jargon?

Which is, of course, exactly Romm's point.

If facts were sufficient to persuade people, then experts in the science world would rule the world. But facts are not, and scientists do not.

We scientists can continue to try and beat people upside the head with our science "facts," but perhaps it's time to try a more artful approach using metaphors and extended metaphors. As long as they're short, sweet and repeated often. **SC**



People (and Animals) Calling it Right

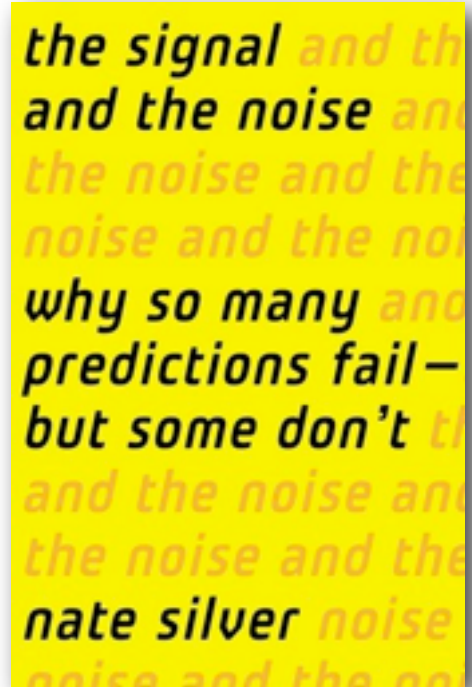
***The Signal and the Noise: Why So Many Predictions Fail—But Some Don't.* By Nate Silver. Penguin, 2012. 544 pages.**

Reviewed by [Peter Kareiva](#), chief scientist, The Nature Conservancy

If you paid any attention to the U.S. presidential race, you almost certainly heard of Nate Silver, who predicted on his *New York Times* “538” blog the precise Electoral College vote — getting 50 out of 50 states correctly. This wasn’t a fluke: In the 2008 election, he got 49 out of 50 states right. For these and other statistical analyses, Silver has earned the label “public statistician,” and *The Signal and the Noise* (about prediction and forecasting) is a must read for enviros of all flavors.

Here is why: Environmentalists handle uncertainty poorly. We tend to think consensus is some measure of reliability in predictions when it is not. We undervalue and put too little energy into explicitly testing predictions and then revising our ideas and models accordingly. Silver’s chapter on predicting climate change is a must read (and do not worry: Silver is not a climate skeptic — but he is critical of how climate models are used).

My favorite quote from *The Signal and the Noise* is: “[T]here is a fundamental difference between science and politics. In fact, I’ve come to view them more and more as opposites. In science, progress is possible.” I cannot recall a book that is so profound, yet delivered in such an entertaining and easy-to-read style. This may come off as condescending, but an understanding of Bayes Theorem should be required of anyone who uses data to inform their decisions in an uncertain world. Of course if you do not live in an uncertain world, there is no reason to read Silver’s treatment of Bayes Theorem. And if you do not use data to inform your decisions, you also can skip this homework. But for the rest of you, I strongly recommend this book for pleasure and for illumination. **SC**



People (and Animals) The New Neighbors

***Nature Wars: The Incredible Story of How Wildlife Comebacks Turned Backyards into Battlegrounds.* By Jim Sterba. Crown Publishers. 368 pages.**

Reviewed by [Peter Kareiva](#), chief scientist, The Nature Conservancy

North Americans are really confused about nature, and in *Nature Wars* Sterba tells story after story recounting the depth of that confusion and how it interferes with common sense resource management. The source of the confusion is a concatenation of detached urban populations, romantic depictions of wildlife in Disney movies and nature shows, animal rights movements, a growing wildlife-human interface, and some bizarre notions of what is “natural.” Since all of these ingredients can also be found outside the United States, we can expect the confusion to spread and to become a real problem for conservation.

Just one example: Deer populations have exploded in the eastern United States with a surplus of habitat (along with humans feeding them in suburbia), a decline in hunting, and an absence of natural predators. And this development is not just an inconvenience — deer are now the predominant wild vertebrate killers (“predator,” if you do not require eating to be part of the definition) of humans in the United States, through collisions with cars. Almost inevitably, whenever a community attempts to come to grips with deer overpopulation, acrimony ensues. Princeton Township hired special sharpshooters to quietly (almost secretly) kill deer and remove their carcasses under cover of night, at the cost of \$350 per deer. Also under cover of the night, opponents smeared deer guts over the Honda owned by the mayor (who had sanctioned the deer control program). New Jersey, the nation’s most densely populated state, has 3,500 black bears commingling with 8.7 million people. Hunting of bears is contentious, but it was probably a good thing when New Jersey Governor Chris Christie authorized bear hunting in New Jersey in 2010 (it had actually been a campaign issue).

A big challenge for conservation will be the recalibration of how humans and wildlife interact in a world where the boundaries between the two are blurred, yet the public’s experience with and knowledge of wildlife is at an all-time low. **SC**

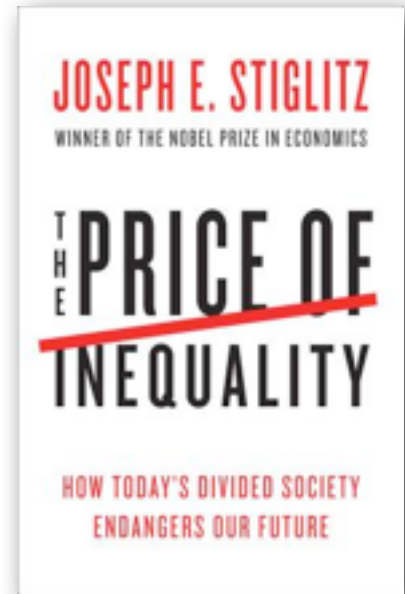


People (and Animals) Totally Unfair

The Price of Inequality: How Today's Divided Society Endangers Our Future. By Joseph E. Stiglitz. W.W. Norton & Co., 2012. 449 pages.

Reviewed by [Peter Kareiva](#), chief scientist, The Nature Conservancy

The occupy Wall Street movement may not have had a constructive agenda. But it struck a chord of “something is wrong” today in the United States, where the upper 1% have accumulated such a disproportionate amount of wealth and influence. In this fiercely written book, Nobel Prize-winning economist Joseph Stiglitz probes our current excessive inequality (and I wager anyone reading this book review is on the upside of that inequality — even if you’re not in the upper 1%) and makes a strong case that it is a matter of national security to redress it.



Inequality imperils our democracy, says Stiglitz. His data, writing and arguments are compelling and depressing. You cannot read this and not feel guilty about your own privilege. So many others writing about the upper 1% focus too much on wealth itself, and too little on opportunity. It does not really bother me that the upper 1% has one-third of the wealth in the United States. The real issue is upward mobility. The fact that poor kids who succeed academically are less likely to graduate from college than rich kids who do worse in school is an unfairness that eats at me. Or consider this: in Denmark, 75% of the children born into the bottom 20% make it out of that bottom. In the United States, only 58% of that cohort do. Amazingly, there is less upward mobility in the United States now than in the United Kingdom.

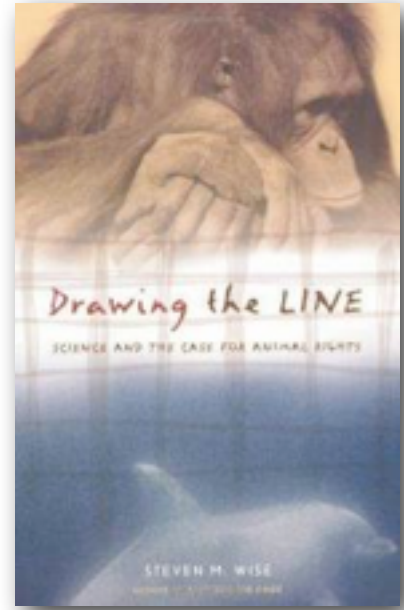
By focusing on opportunity as opposed to the distribution of wealth — an opportunity that both institutions and individuals can create — Stiglitz gets us closer to a solution to our divided society. You might wonder why all this might matter to conservation? It is simple — nature can be one of those assets that is there for people no matter what their income. Second, whereas Wall Street has often generated wealth by phony devices and derivatives, nature can generate real wealth. For sure, nature is not THE solution to inequality, but it is a salve to the divisions and despair of what Stiglitz feels is a deeply flawed economic system. **SC**

People (and Animals) My Golden Retriever is Smarter Than Your Honors Student

***Drawing the Line: Science and the Case for Animal Rights.* By Steven M. Wise. Basic Books, 2003. 336 pages.**

Reviewed by [Jon Fisher](#), spatial scientist, The Nature Conservancy

There are arguably two things going on in this book: an honest and fascinating exploration of animal cognition, and an interpretation of how that should affect legal protections for different species. Some people reading this may be turned off by the latter — but do yourself a favor and read *Drawing the Line* anyway. Wise starts by taking you through some of the basics of human developmental psychology, using his son as an example (guaranteed to be riveting for any scientists with kids). He then examines seven different animal species (one per chapter) to see how they compare to us. While his intent is to determine where to “draw the line” for some kind of legal protection for each of these species, it’s the details on how each animal thinks and how that was tested that has encouraged me to read and reread this book a few times over the past 10 years.



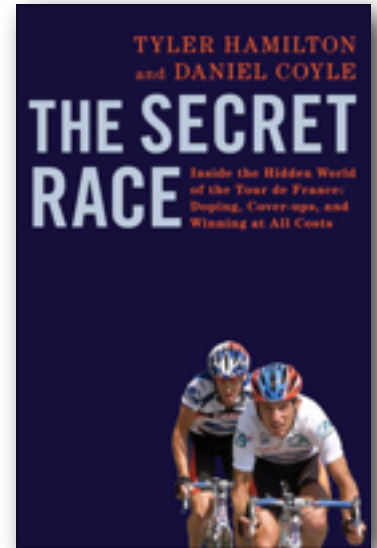
Some of the characters being used as examples in this book are animal celebrities (Alex the African Grey parrot and Koko the gorilla), while others are less well-known (the author’s dog). Throughout, Wise makes it clear which abilities seem to be typical of a species and which seem to be exceptional. The writing style of this book is clear and compelling, something most of us could probably do better at. But if you’re not up for a learning experience over the holidays, read it just for having some good anecdotes at your next cocktail party. From the complex language of honeybees (and the way that hives process that information) to the universally relatable mind of the household dog, I challenge anyone to read this book without gushing to a friend about one of the fascinating stories it contains. **SC**

Memoir/History Shoot 'Em Up

***The Secret Race.* By Tyler Hamilton and Daniel Coyle. Bantam, 2012. 304 pages.**

Reviewed by [Charles Bedford](#), Asia regional managing director, The Nature Conservancy

I nominate this fascinating story for the best science book of the year in two categories — bio-chemistry and psychology. Tyler Hamilton, a cycling hero, Olympic gold-medal winner and teammate of Lance Armstrong in the early 2000s, tested positive for performance enhancing drugs. After years of maintaining his innocence and trying to get back into biking, he agreed to tell all to a federal prosecutor and the world. *The Secret Race* is his remarkable story of the corruption and moral turpitude that run through all the "moneyed" sports; the psychological walls that cyclists, doctors, managers, coaches, and race directors must build within their own minds to make it through the days; and the veritable arms race of chemicals that are being poured into the healthiest bodies on the planet to give them just a little edge over their competitors. And all brought to you by the big-money vehicle for advertising that professional sports have become.



The revelation is how Armstrong thought about cycling — from a completely professional perspective. He assumed every other racer was also doping and that you were a chump if you didn't get just as good at it (and avoiding the testers) as you were on the bicycle. It was a truly rational view, shared by virtually everyone in professional cycling. Hamilton chronicles his own first encounter with this reality, as well as how the moral objections of others evaporated over the space of weeks, days or even an afternoon. They were 20-year-olds, faced with the choice to take drugs like everyone else or to abandon the dream that they had held since childhood, that had molded their lives so fundamentally that their identities were inextricable from their bicycles.

Hamilton has come to terms with his choice and his life, as have virtually all of professional cycling's greats from the last 15 years. What isn't clear is whether cycling (or any professional sport) can change. Cycling has always had pro sports' most rigorous anti-doping regime. (Have you ever seen footage of '70s era basketball or football players? It's inconceivable that the 25% increase in muscle mass of today's players comes through better diet and training.) But the incentive to win, to gain fame and fortune is extraordinarily powerful. And science can help to tilt the playing field your way, or make the hill less steep. I hope *The Secret Race* helps to make parents a bit more thoughtful about pushing their kids into competitive sports — or stick to curling, which is probably the only sport unaffected. **SC**

Memoir/History

Life, the Best You Can

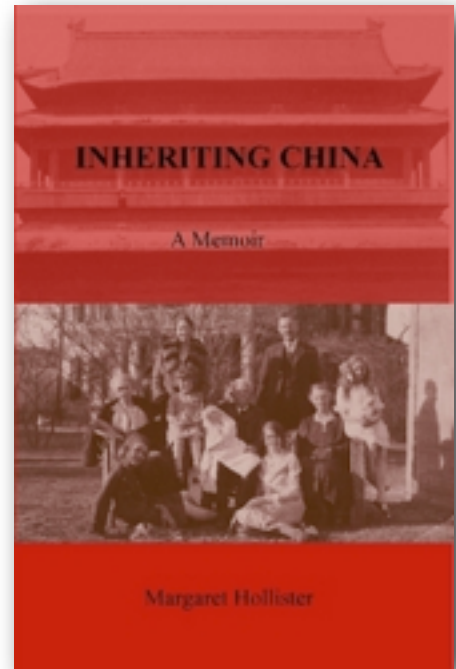
Inheriting China: A Memoir. By Margaret Hollister. Self-published, 2011. 368 pages.

Reviewed by [Jon Fisher](#), spatial scientist, The Nature Conservancy

When I'm not reading something educational, I usually read science fiction. The mix of unconstrained ideas and fast storytelling are a relaxing relief from the world of facts. So when my 95-year-old great aunt (whom I only recently met) handed me her just-published memoirs, I was expecting to find it pretty dull; I almost never read autobiographies. Instead, I found myself rethinking my reading habits.

Inheriting China is a great mix of a fascinating life story, a look into what China was like in the early 20th century (where she grew up), and a peek into the unique culture of missionaries living abroad. I found myself surprised both at how much good work missionaries had carried out in China (e.g., both science education and poverty relief) as well as how difficult and repressive they could be. In the end, I found myself both learning a lot about an unfamiliar subject and wanting to see what would happen next in the story.

One high point for me: while temporarily fleeing to Scotland to escape anti-foreign sentiment, Margaret's younger sister is hit by a car en route in Indonesia. Her mother gets into an ambulance with the injured sister, and leaves a 10-year-old Margaret with her other two sisters (ages four and one) to fend for themselves in a foreign city, with the helpful advice: "Do the best you can, Margaret." Anecdotes like that kept me glued to a book I normally would never have read. **SC**



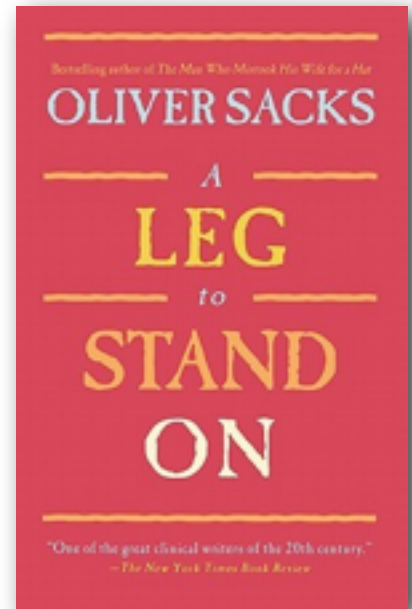
Memoir/History

Shake a Leg

***A Leg to Stand On.* By Oliver Sacks. Touchstone, 1998. 224 pages.**

Reviewed by [Patrick McCarthy](#), director of conservation, Colorado River Program, The Nature Conservancy

Oliver Sacks' books bring out the magic of the natural world and reveal the essential nature of science as a blend of deep curiosity, observation and logic. His chosen field — neurology — is always put in the service of solving the problems of ordinary people who find themselves in extraordinary and sometimes inexplicable circumstances, such as the victims of encephalitic lethargica who return to the world after decades of “sleep” in *Awakenings*. In his little-read third book, *A Leg To Stand On*, Sacks turns his astonishing powers of observation and logic inward. This “neurological novel,” as Sacks calls it, tells of his deeply disturbing experience with post-injury paralysis and alienation of a limb — a leg that no longer responds to his will, nor even feels a part of his body.



After an encounter with a bull in the mountains of Norway turns out badly, Sacks' leg is operated upon — “fixed,” or so he believes. His surgeon expects a speedy and full recovery. But when Sacks cannot regain use of the leg, neither his doctor nor anyone in the London medical community can explain it. Only weeks of correspondence with a Russian neurophysiologist and an epiphany brought about by intensive listening to a Mendelssohn concerto bring intellectual understanding and a cure. This deeply emotional book is also one of the most scientifically lucid that I have read. Read it if you can find it. **SC**

Memor/History

Hungry for Change

***Tombstone: The Great Chinese Famine, 1958-1962.* By Yang Jisheng. Farrar, Straus & Giroux, 2012. 656 pages.**

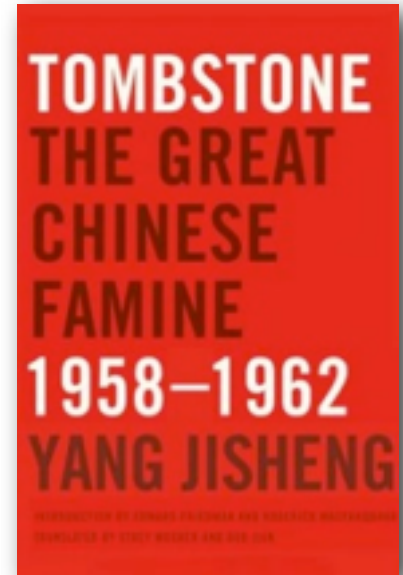
Reviewed by [Charles Bedford](#), Asia regional managing director, The Nature Conservancy.

Just released in English this fall (but still not available in his home of Beijing or anywhere in China) is *Tombstone*, Yang Jisheng's massive work describing the consequences of Mao's Great Leap Forward from 1958-1961, during which 36 million people died as a direct result of brutal totalitarianism. What is particularly stark is that, 50 years later, the same political system is in place.

The accounts of brutality and depotism in *Tombstone* will exhaust you: petty bureaucrats eating while those around them starved; full granaries in towns where the death toll was over 50%; cannibalism as a common practice; children being drowned by parents to save them from certain starvation; fatal beatings and "struggle sessions" of commune managers who didn't meet their quotas for bringing more grain in from their villages to satisfy the inflated reports of provincial officials. While it all happened, the Chinese government blamed drought and weather. The Cold War and the contemporaneous Sino-Soviet split made it impossible for the international community to intervene, though some have hung the blame on the West for knowing and failing to do more.

China has undergone an enormous transformation since Mao's time — and after more than 20 years of economic reform, today's totalitarian system is far more flexible. But because the political system remains unchanged, China's great economic and social changes have resulted in an unequal allocation of the fruits and costs of economic reform. The combined abuses under the exclusive profit orientation of a market economy and the untrammled power of totalitarianism have created an endless supply of injustice, exacerbating discontent among the country's lower-class majority.

Despite all this. Yang is optimistic. He writes this book as a tombstone, not just for the victims of the famine, but in anticipation of the end of totalitarianism in China — as he writes: "I believe that rulers and ordinary citizens alike know in their hearts that the totalitarian system has reached its end." And apparently, so does the new leadership in Beijing. Wang Qishan, long regarded as one of the few leaders who gets things done, has been appointed not to head commerce and central planning, but to head the Party's



Central Commission for Discipline. This appointment would, if the United States were a one-party country, be akin to appointing Mitt Romney to the office of Attorney General and FBI director.

Yang watched his own father die from starvation at the beginning of the famine, rushing home just a little too late to save him. And it took him decades to believe the truth of the cause rather than the lie of the cover-up. *Tombstone* is a stunning memorial to his father and 36 million other souls. But it is unclear whether his fellow Chinese will ever see it. **SC**

The End We're All Going to Die

***The Fate of the Species: Why the Human Race May Cause Its Own Extinction and How We Can Stop It.* By Fred Guterl. Bloomsbury USA, 2012. 224 pages.**

Reviewed by [Darci Palmquist](#), senior science writer, The Nature Conservancy

Do thoughts of humanity's collapse keep you up at night?

First, the good news: A zombie apocalypse is not one of the many doomsday scenarios you should worry about. The bad news: Super bugs, sudden climate disruption and biowarfare are.

With a twinkle of gallows humor, Guterl explores six end-of-the-world scenarios, ranging from ecological (climate change and mass extinction) to viral (killer flus) to artificial (machines). Guterl is executive editor of *Scientific American*, so it's safe to say he's done his research — and knows how to tell a good science story. This book certainly delivers.

Drama, sci-fi technology, mystery, innovation and fear all play out in this dark but oddly entertaining book.

Of particular interest to the environmentalist: Guterl describes a “new breed of ecologists who have a numbers sense” — researchers using advanced math to uncover more about how the planet works than we've ever known before. He also explores the current research on climate change tipping points. And he deftly relates the tale of cyanobacterium (pond scum), the only species known thus far to cause a mass extinction event. Will humans be the next pond scum?

This book is not pessimistic. In fact, Guterl believes “optimism is our best weapon.” But it's interesting to note that he encounters many scientists who don't much want to talk about how real the prospect of these collapses might actually be. One can't help but wonder: Is optimism actually a weapon, or a shield? Case in point: the latter half of the book's subtitle — “and how we can stop it” — is a short afterthought to the book. **SC**



The End Pass the Cipro, Please

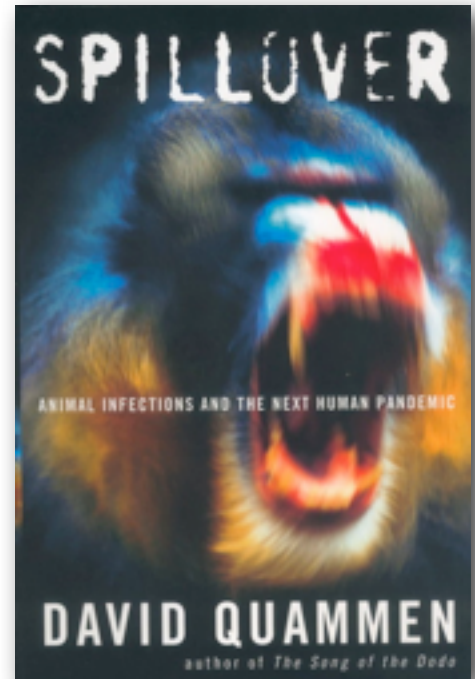
***Spillover: Animal Infections and the Next Human Pandemic.* By David Quammen. W.W. Norton, 2012. 592 pages.**

Reviewed by [Matt Miller](#), senior science writer, The Nature Conservancy

“We shake the trees, figuratively and literally, and things fall out,” David Quammen writes in his latest book, the monumental *Spillover*. Some of the things that fall out happen to be very, very bad for humans. While virus-borne pandemic may seem a topic that has been written about to death (no pun intended), Quammen brings a fresh take, examining not just medical research but also ecology. Avoiding sensationalistic predictions, he traces the spread of some very nasty bacterial and viral diseases, including Ebola, SARS, Hendra and AIDS.

He finds story after story of zoonoses — diseases that jump from animals to humans. Why? Well, it’s that tree shaking we’re doing — deforestation, killing wildlife, penetrating ever deeper into wild places. These trends, Quammen argues, put us increasingly in contact with dreadful viruses — some of which win an evolutionary gamble by successfully taking up habitation in humans. And spreading.

Quammen studiously refuses to engage in apocalyptic fantasies; the well-documented truth is scary enough. There’s plenty here for conservation biologists to ponder, but read it for this, too: Quammen’s grasp of science writing. No one tells a science story better, and *Spillover* is his most powerful work yet. I admit envy of his painstaking research, his willingness to put himself in harrowing situations and, yes, that beautiful writing. Study it, ponder it, enjoy it. Then get a flu shot, pronto. **SC**

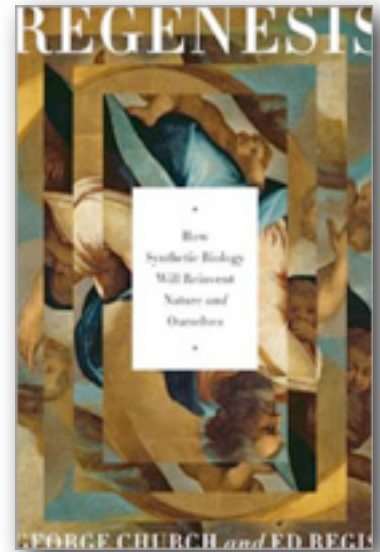


The End Is Extinction Forever?

***Regenesi*: How Synthetic Biology Will Reinvent Nature and Ourselves.** By George Church & Ed Regis. Basic Books, 2012. 304 pages.

Reviewed by [Peter Kareiva](#), chief scientist, The Nature Conservancy

Molecular biology has made advances that most of us in conservation or the environmental sciences eye suspiciously. Suspicion based on knowledge might be okay. But suspicion based on ignorance is not. It is time we all paid more attention to biotechnology — especially the branch of it now being called “synthetic biology.” Church and Regis have written an astonishing book telling us of the things that can now be done by “reading and writing” DNA at will — sometimes synthesizing new genes, and maybe even new organisms. Take extinction. In 2000, the last living Pyrenean ibex (or bucardo goat) was crushed by a falling tree, and the IUCN declared this Spanish ibex extinct. Luckily, a biologist had scraped some ear cells from that last bucardo prior to its death and frozen those cells. In 2003, a nucleus from one of those ear cells was placed in the egg of a domestic goat and a bucardo was resurrected from extinction — the infant goat lived only seven minutes, but was clearly a bucardo. Remembering that the first flight of the Wright brothers lasted only 12 seconds, and that within 66 years we had a man on a moon, one can only wonder what we will be doing with genetic cloning and DNA manipulation in 2069. There is talk of resurrecting the passenger pigeon, the Tasmanian wolf and even the mammoth. Even if we never venture into this Jurassic park world, surely the technology could help nearly extinct species get through bottlenecks until habitat pressures relax as human population’s shrink or leave the countryside for cities.



Genomic technology represents a brave new world that could be hugely beneficial to the environment. In 1980, it cost \$50 to read or write one base pair of DNA. Now, for \$1, we can read and write 10,000,000 base pairs of DNA. Already this inexpensive automation of DNA technology has led to the engineering of microbes that turn corn syrup into plastic cups and bottles that are 100% biodegradable in only a few months. Other genetically engineered microbes make the main ingredient of Sorona, which is Dupont’s fiber that is woven into Smart Strand carpet — the carpet that rightly is advertised as green because it is made from corn sugars as opposed to petrochemicals. Maybe we could plant a seed that then grew into a house — it sounds wild, but Church and Regis will convince you it is not totally far-fetched. The possibilities for the human species itself are even more fantastical. This wonderful book will open your eyes to a world we nature-lovers rarely consider, but a world that is as key to the future as all of the other things we talk about around the campfire. **SC**

Poem

'Twas the Night Before Christmas...at TNC

Editor's Note: This unattributed poem was recently discovered deep in the archives of ConserveOnline and sent to *Chronicles* for disposal:

'Twas the night before Christmas, and throughout TNC,
Not a creature was stirring, by Mark Tercek's decree.
Mist nets had been hung from our office walls with care,
In hopes that St. Peter soon would be there.

The Conservancy's scientists were snug in their beds,
While visions of grant funding danced in their heads.
The board, the trustees, even Bill Ginn in his cap,
Had just settled in for a long winter's nap.

Then WO's native garden was filled with a clatter!
We sprang to the windows wondering what was the matter!
Through the halls into doors we flew with a crash,
'Til I dug out my pass card — then outside in a flash.

The moon on the breast of the new-fallen snow,
Gave the glare of a (climate-changed) summer below.
When, what to our wondering eyes should appear,
But a broken-down hybrid, and eight tiny reindeer.

Such a curmudgeonly driver, such a sad-looking beater,
I knew in a moment it must be St. Peter.
Swift as black-footed ferrets his coursers they came,
And he griped, and he grumbled, and he called them by name:

"Now, Fargione! Now, Kiesecker! Now, Palmer and Gordon!
On, Molnar! On, Spalding! On Durnin and Doran!
To *Nature* and *Science*! *PLoS One* and *Frontiers*!
Now publish! Now publish! Let's impress all our peers!"

As the oak leaves of old TNC logos do fly,
Out of favor, they tend to mount to the sky.
So up to the rooftop the coursers they flew,
Pulling people, and nature, and St. Peter, too.

And then, in a twinkling, I heard on the roof,
"Great places" and "biodiversity" disappear in a poof.
As I drew in my head, and was turning around,

Out of his office Old St. Peter did bound.

His garb was quite frightful, from his head to his foot,
Wearing basketball shorts! He seemed rather caput.
A ragged old athletic bag he'd flung on his back,
And he looked like a peddler, just opening his sack.

His eyes — a bit bleary! His dimples — quite scary!
"It's a round-the-world red-eye," he yelled, "and I can't really tarry!"
His droll little mouth was drawn up in a sneer,
He looked right at me and said: "Pumpkin! Where's my beer?"

A cigar made of OGSPs did he puff, this freethinker,
And the smoke it gave off set off all the WO sprinklers.
He had a broad face and a little round belly,
That shook when he insulted you, like a bowlful of jelly!

He was gruff and forbidding, a cantankerous chief scientist,
I laughed when I saw him, in spite of Compliance!
But a wink of his eye as he quaffed his first ale,
Soon gave us to know his gifts wouldn't fail.

To Sanjayan, a TV show! To everyone, returned emails!
Then he filled all our mist nets with projects at scale!
To XA — timely science! Much praise for the field!
Even a promise to Philanthropy to keep his lips sealed!

Then he sprang to his sleigh, to his team gave a whistle,
And away they all flew like the down of a (non-invasive) thistle.
But I heard him exclaim, 'ere he drove out of sight,
"Happy Anthropocene to all, and to all a good-night!" SC

The Mission(s) of *Science Chronicles*:

1. To bring you the latest and best thinking and debates in conservation and conservation science;
2. To keep you up to date on Conservancy science — announcements, publications, issues, arguments;
3. To have a bit of fun doing #1 and #2.

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