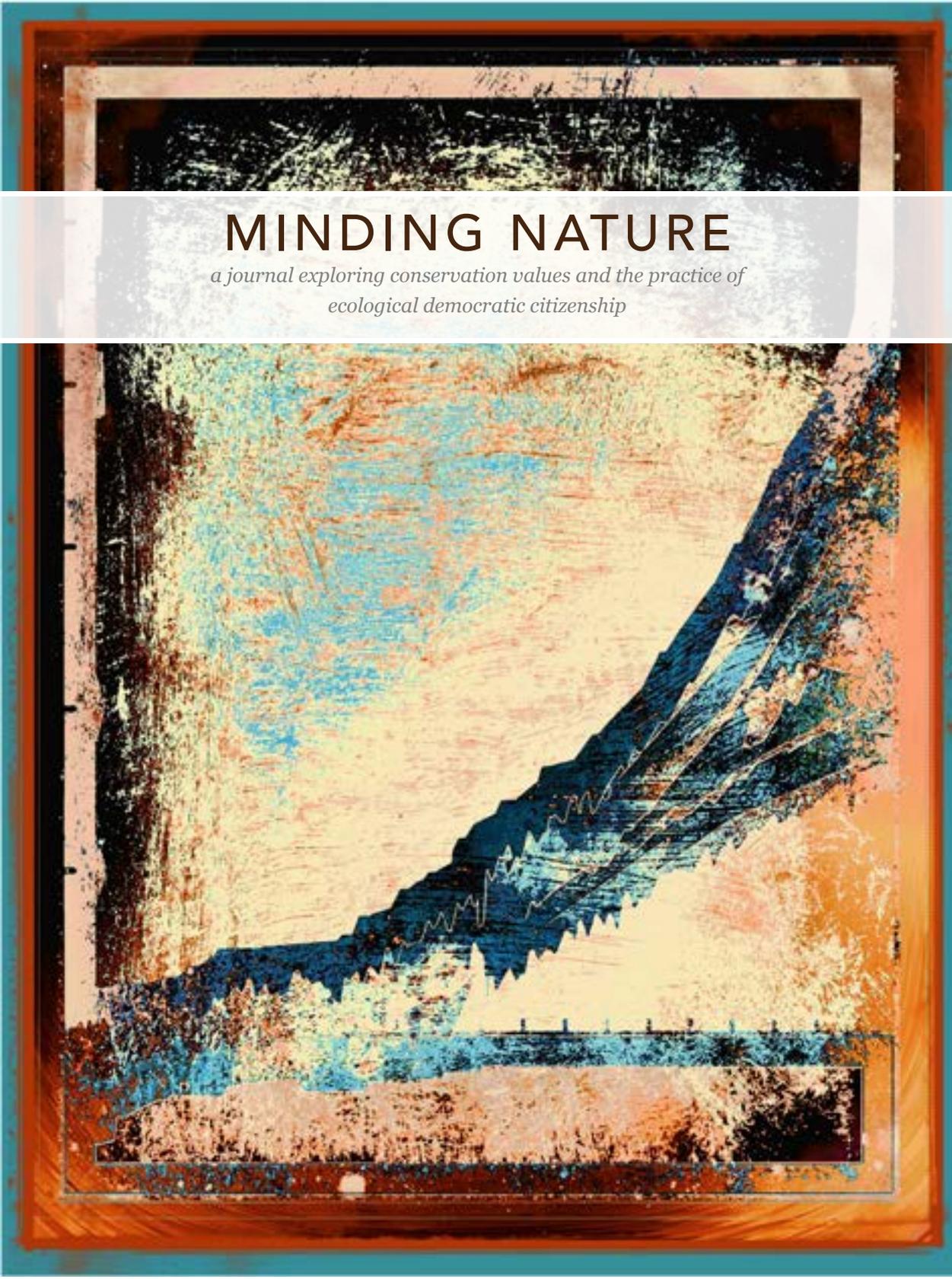


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Expanding our Natural and Civic Imagination



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ecological democratic citizenship*

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ON THE COVER

Alisa Singer, Emissions Levels Determine Temperature Rise (rust), 2014. Image used by permission of the artist.

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THE TYRANNY OF NO ALTERNATIVES



BRUCE JENNINGS

WHEN THE 2015 PARIS ACCORDS WERE ratified and became law a short time ago, U.N. climate chief Patricia Espinosa and Moroccan Foreign Minister Salaheddine Mezouar said in a joint statement, “Humanity will look back on November 4, 2016, as the day that countries of the world shut the door on inevitable climate disaster.”¹ Perhaps this will be the judgment of history on our generation. Perhaps that judgment will be less generous in view of how much more could have been done between Kyoto in 1992 and Paris twenty-four years later. Too many Hamlets have been at the helm of political leadership; too many citizens have not been able to see any alternative to the political impasse. In any case, the hour is so late that candor requires talking about a less bad future rather than a better one.

How much less bad? What contribution will the people of the United States make to determining how bad it is? Powerful people and institutions want to change the subject rather than change the economy. Much in the political turmoil and clamor that is coming in the Trump years will attempt to distract us from this question. We should not let that happen. The onus is not on the government really, but on the responsible party named in the preamble to the Constitution: “We the People of the United States.” That would be us, and, yes, I do mean all of us, despite all the injustice and inequality that divides America in other ways. The climate responsibility of We the People, the moral responsibility that crosses borders of place and generation, can and should have a keystone function in our civic ecosystem. It is the needle of the moral compass of our thought and action. We must pay more attention to where that needle is pointing. Simone Weil said, “The capacity to give one’s attention to a sufferer is a very rare and difficult thing; it is almost a miracle; it is a miracle.”² It won’t be easy, this act of paying attention to a suffering future and biosphere; it never is.

On November 8, 2016, the American electorate shut the door on leaders who might have taken the Paris accords to heart. As I write this,

odds are that the government of the United States intends to take the American people and go AWOL in the fight against global warming and climate change. Officially the United States cannot withdraw from the Paris agreement for at least four years, but President Trump has made it clear—indeed, made a promise to his supporters—that U.S. policy will be such that we will not meet our pledged emission reductions. There is a difference between a people and a government. Only tyrannies erase that difference. In a free society, if a government chooses to ignore important responsibilities in the use of its power and authority, that does not mean that a people must do likewise.

Perhaps it is time to take “think globally, act locally” out of the cliché bin and polish it up. Suggested in the work of town planner Patrick Geddes and much later given currency by René Dubos and David Brower, the slogan was a clarion call of ecological and moral imagination, urging us to see and care in new ways, to understand and emphasize more broadly. It admonished us to go beyond the limits of our own individual lives, nationalities, and ethnicities, so as to affirm our common membership in the great community of life. At the same time, it was a call to attend and abide in practice on our home soil, to be emplaced

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agents of conservation and change. This dual message was meant, I suppose, in a pragmatic John Deweyesque spirit. The ecological crisis demanded more than imaginative castles in the air. Only in their local attachments and commitments would large numbers of people find the motivation and resolve to bring about meaningful change. At that time, an environmentalism focused on reducing various forms of pollution and promoting better ecological management had strong support within the federal government. If only we still had the bipartisan political climate of the 1970s in environmental policy today. Even back then, climate change brought on by greenhouse gas pollution of the atmosphere was already on the scientific horizon and might have been acted on earlier.³ But the imperative of responsibility got lost.

As our understanding of deleterious human impacts on the biosphere has grown more robust, both the regulatory capacity and the political will of the national government have withered. This reflects a rightward shift to free-market ideology and the corruption of democratic representation by the campaign finance system. We simply cannot expect federal law or public policy to have a positive influence on the carbon footprint of the United States for the foreseeable future, let alone on other issues such as land-use regulation and the preservation of vulnerable wilderness areas atop coveted fossil carbon and other mineral deposits. Nonetheless, the redoubling of efforts to build networks and coalitions for climate action could be the silver lining of the Trump victory. These networks will be comprised of states, cities, and local governments, as well as nongovernmental organizations in the civil society and commercial interests supportive of technical innovation and market development for green products and services. Such networks, by the way, need not stop at the geographical boundaries of the nation-state.⁴ The globalization of economic life is problematic in many ways, but the interdependencies it has created can provide important leverage for eco-civic reforms.

Moreover, thinking globally and acting locally recognizes the fact that environmental protection—the phrase sounds a bit anemic now in the face of climate change, biodiversity loss, and Anthropocene responsibility—is a global problem, but one that ordinary citizens can address by making efforts in their local communities. This is a pertinent reminder for today also. The end run below the national government by We the People is not only about institutional networks and coalitions, as crucial as an institutional response is. It is also about eco-civic action by individuals in communities and families. It is about reform in our personal ways of living and in our private habits of the heart.

As economists will tell us, the logic of collective action says that unilateral change initiatives by individuals—that is to say, acts of courage and vision—are futile and self-sacrificial. If castles in the air are not what is needed, neither are *les beaux gestes*. Structural incentives, like a carbon tax, are the key.

Well, yes and no. Structural incentives are necessary but not sufficient. Unless they arise impersonally out of technological innovation or shifts in market demand, they must be deliberately planned and implemented, and that is most effectively done at a nation-

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al level, and with many nations acting in coordination and concert. This is precisely our current dilemma, since political support for such national governance in America is temporarily lacking. Of course, other nations in coalition may move forward without us, but ultimately the American economy must be part of a global solution. It is too big to drop out.

Equally troubling, this way of thinking is flawed because it is premised on self-interested rationalism and very limited benevolence—assumptions that grossly underestimate the actual possibilities of civic motivation and agency. It places its bet on private consumptive vice to produce public climate virtue. Not only is it waiting for a horse that will never come in, it is at the wrong racetrack altogether.

Telling people that only re-structuring incentives and markets at the national level will work does have the effect of letting individual citizens off the hook. This narrative reinforces what might be called the tyranny of no alternatives.⁵ It reinforces the tendency of individuals to feel powerless and overwhelmed, and it gives people a rationalization for inaction. This is as insidious in its own way as climate change denial and the well-orchestrated and funded misinformation campaigns that support it.⁶ Defeatism and civic surrender come from a failure of political imagination and an inability to see what is right under our noses precisely because it is so ordinary and so close at hand. We have acquired the bad habit of expecting solutions from experts above us, vertical expertise, and have unduly discounted the horizontal wisdom of fellow citizens that surrounds most people in most places.

We ask ourselves, What can I do? We should ask, What can I do in concert with others? Not only in collective concert with millions of others, such as the Climate Action March in 2014, but also in personal concert with scores or hundreds of friends and neighbors. These are local actions tailored to local needs and conditions. Concrete

examples are near at hand and plentiful. Change local building codes to require that all new building and renovations utilize highly energy efficient materials and systems. Amend regulations to facilitate conversion to renewable energy technologies and set up financing mechanisms that make their adoption affordable. Reduce automobile dependency through zoning that promotes close proximity between residential units, public transportation hubs, and commercial services. Take back the streets for safe, pleasant walking and cycling. Preserve wetlands and provide migration corridors. Decrease the mass of the waste stream and increase recycling. These are small changes within local and personal reach, big ideas scaled down to the dimensions of everyday civic life.

How can we break out of the tyranny of no alternatives? The time does not seem propitious, yet doing so is now more important than ever. I believe that the antidote to feeling powerless and stuck lies in several important ideals and practices, namely, civic learning, civic solidarity, equality of mutual civic respect, and civic empowerment. I will define what I mean by this in a moment. The reach of the tyranny of no alternatives is much broader than ecological issues, of course. It infects most areas of econom-

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ic and social injustice in our neoliberal age. But in the environmental domain, a countervailing push back against this tyranny and an answering response to it lie in an eco-communitarian vision coupled with an eco-civic action strategy.

Democracy holds that law and policy should be based on the majority consent of the governed. But civic democracy—the kind of democracy to which the United States has traditionally aspired, but not always fulfilled—is more demanding. It requires informed public consent, a collective agreement to pursue the public interest and justice. Consent that is truly informed and public relies on the capability of citizens to focus on how interests they all share can be defined and fulfilled as common purposes. And it requires their ability and willingness to understand what such interests mean through mutual dialogue with others. This is what I meant by the adjective “civic” when I spoke before about civic learning, civic solidarity, civic respect, and civic empowerment.

These capabilities do not just happen, and where they exist, they should not be taken for granted. They must be supported and nurtured. Some doubt that a sense of common purpose can be achieved in a diverse, pluralistic society. I believe that it is precisely in a pluralistic society that civic capacity building is not only possible, but necessary. Pluralistic societies that lose an overriding sense of public or shared purpose undermine their own stability and their democratic future.

Civic capabilities are the product of our major learning systems—educational institutions, electoral and policy debates, news sources, books and periodicals, and structures of communication, from the mass and social media to local community meetings. But these learning systems themselves must appreciate the civic function they provide and value it. Today our learning systems have other self-images and agendas—branding, market share, amassing celebrity capital. It seems clear from the current fragmentation of our discourse

and our politics, that these systems are part of the problem, not the solution. The state of civic learning today is not healthy. What is undermining it? How can it be revitalized? What might a just and resilient civic democracy mean in America today?

I think that we must work to rehabilitate three things that are in disrepair: First, we need to articulate an accessible language of shared purpose—a vocabulary that gives voice to values that today go unheard and unheeded. Next, we need to be more open to innovation and devise experimental practices to build more democratically empowered public spheres for ecological governance at the local level—communities of conservation. And finally, we need to develop a support system for solidarity and knowledge exchange in communities across the country—a network of civic learning.

I say “rehabilitate” because robust civic ideals and values, and institutions of deliberative governance and learning, do not have to be crafted out of whole cloth. A civic renewal movement and network have been building for decades at the local level. In the first blush of progressive hope in the early Obama years, energies were siphoned off to take on progressive and high-profile reforms at the national level. But now

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young leaders are turning their attention again to more modest wells, where the waters of change are not so dark and bitter.⁷

Cultural framing and social power set the terms and possibilities of civic learning. They inform the convictions and contentments that individuals pursue in their everyday lives. But frames are changeable and power is fluid. America's capacity for practical and institutional civic learning determines how wide a gap there will be between its normative ideals and its actual practices. With civic learning that gap will narrow; without it, in a time of disagreement and conflict-generating communications and worldviews, the gap will widen. Indeed, at such times the content of those normative ideals—freedom, equality, justice, and mutual respect and care—may itself erode and morally degrade, as when freedom becomes exclusionary or when mutuality embraces only those who are alike.

Indeed, one gets the sense that there are deep factors in American political culture that are threatening traditional civic ideals. The outcroppings of these underlying factors are readily apparent: partisan political paralysis, loss of trust and confidence, and an extreme ideological indifference, widespread among officials and citizens alike, to the public interest when it comes to law or policy. For some time now, the sense of public purpose in our politics, our governance, and our public discourse has been eroding. Authority, as Hannah Arendt once remarked, is “leaking” from our institutions, drop by drop. One might say the same thing about civility and mutual respect. As authority leaks out, alienation seeps in.

Perhaps one aspect of the problem lies in the very short attention span fostered by mass and social media. Civic learning requires a certain duration and continuity of attention, during which progressively developed and complex information is assimilated. There is a dearth of civic forum opportunities to engage in serious public or civ-

ic discourse, which is the only kind of discourse that will lead us toward a sense of common purpose.

It is sometimes said that the solution is to reach larger audiences with the right content, such as accurate information about climate change and feasible approaches to converting our energy systems and conserving natural carbon sinks, for example. But larger audiences will not help unless they are made up of viewers or listeners who bring to the information a civic disposition and mentality. Without that, even accurate information may backfire and result in greater mistrust and resentment rather than enhanced understanding. To achieve a better outcome from our outreach, we need to reach citizens who have the capacity to invest a critical, thoughtful, open attentiveness to the grave ecological challenges before us. Directing attention at ecological responsibilities without also building attentiveness regarding them is not enough.

If this capacity is scarce, it can be made more prevalent via civic innovation practices. The critical attentiveness of which I speak comes from direct life experience and the experience of participatory and deliberative civic engagement. Activity in projects of environmental conservation or restoration is civic as well as biophilic. Urban and

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social project activities can also help people develop the dispositions to see interdependence and shared values. These dispositions redound to the benefit of both eco-civic-mindedness and commitment to social justice.

We need to increase the flow of civic messages and discourse before we can increase people's civic attention span and transform attention into attentiveness. Such discourse production requires support and an infrastructure of its own. It requires expensive and time-consuming research and preparation, as well as multiple venues of learning communities engaged in critical examination and debate. One would think that universities and private research institutes might serve eco-civic goals in this way, but the former seem reluctant to engage and the latter have for the most part positioned themselves to engage in the partisan activity of offering controversy-generating content rather than consensus-building content.

This is both a political and a moral mistake. If we are aiming at consensus-generating discourse, then we can't view our own preferred discourse merely strategically or instrumentally as a weapon in a competitive struggle of will and power. The slide into this mindset of politics as competitive advantage and bargaining—the art of the deal, as it were—must find a countervailing resistance in the form of another politics, a discursive, dialogic politics of listening, mutual respect, and common sense—that is to say, a sense of what we have in common.

I have drawn a distinction between conflict-generating and consensus-generating discourse and noted a critical shortage of the latter. That may seem inconsistent with my support for critical attentiveness, but it is not. The problem is not disagreement per se; reasoned disagreement is essential to any kind of learning, including civic learning. The problem is the gradual loss of the capacity to disagree constructively; or worse, the unwillingness to engage enough with fellow citi-

zens to truly disagree or debate with them at all. Indifference feeds upon itself and discourages would-be civic participants. As singer-songwriter Rod Stewart put it in his 1981 song “Young Turks,” “there ain't no point in talking when there's nobody listening.” Our conflict-generating discourse today is bringing about the death of listening.

The intellectual work needed here is partly restorative and partly innovative. Civic democratic theory and its language of common purpose does not have to be invented afresh; it already resides in a rich and varied intellectual tradition. But the world and the dynamics of civic renewal in American society are not static, and new realities require new moral responses. An important part of the tradition of civic theorizing maintains that theoretical insight and conceptual or moral knowledge must not be divorced from practical experience.

Climate models tell us that we are in trouble, but neither economic models nor general principles of political and moral philosophy will get us out of it. We will have to build the conditions of the future with civic engagement and public work. The future is not determined, and it is not really even yet to come. It is here, in formation among our communities, landscapes, and watersheds. In a moment

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of wild politics, we still have domestic common sense to guide us.

This issue of *Minding Nature* contains a special feature we are proud to present. In 2016 the Center for Humans and Nature worked with students at Loyola University in Chicago and students taking part in the Historically Black Colleges and Universities Internship program with the National Park Service, created by the Greening Youth Foundation. Two essays by students from each of these groups are published here, and we fully expect that we will be reading more from these young authors in due time. They address difficult questions about reorienting our economy, the great benefit our national parks provide, and the importance of diversity in the Park Service.

Articles by James Krupa, Alisa Singer, and Kathryn Flinn explore the connections between nature and history. Krupa takes us to the badlands of southern New Mexico in search of a rare animal, the white-sided jackrabbit. The history of conflicts, past and present, pervades the journey, but so does hope. Singer discusses her art, which graces our cover and the article itself. Using factual information about climate change as an element of a visual message about our times, she conveys a kind of knowledge unavailable in other ways. Flinn, a botanist, turns her attention to the fascinating history of the relationship between human greed and ginseng.

Our reviews and reflections contain a rich variety of topics and information. David Lukas, in an excerpt from his new book, uses his naturalist's eye and attentiveness to remind us of how much is there waiting for us in the familiar landscape of language. Reminding us of the important work of Thomas Berry and the award-winning documentary *Journey of the Universe*, Mary Evelyn Tucker describes a series of Massive Open Online Courses presented from Yale University in 2017. Joyce Munro presents a

brief story of early printing efforts by an ancestor of Strachan Donnelley, the founder of the Center for Humans and Nature.

Rounding out the issue, Julia Travers discusses the importance of new approaches in environmental law. Gavin Van Horn reviews *City Wilds: Essays and Stories about Urban Nature*, edited by Terrell F. Dixon. The Last Word finds Michael Jawer reflecting on animal souls.

Bruce Jennings is Senior Fellow at the Center for Humans and Nature and Editor of *Minding Nature*. His latest book, *Ecological Governance: Toward a New Social Contract with the Earth*, was published in 2016.

NOTES

1. Agence France-Presse, "The Historic Paris Climate Change Agreement Just Became International Law," Public Radio International, November 5, 2016, at <http://www.pri.org/stories/2016-11-05/historic-paris-climate-change-agreement-just-went-effect>.
2. "Reflections on the Right Use of School Studies with a View to the Love of God," in G.A. Panichas, ed., *Simone Weil Reader* (Mt. Kisco, NY: Moyer Bell Ltd, 1977), 51.
3. S.R. Weart, *The Discovery of Global Warming*, Revised and Expanded Edition, (Cambridge, MA: Harvard University Press, 2008). A personal footnote to this history: my wife, Margaret Jennings, a software engineer, worked from 1972 to 1977 at the NOAA Geophysical Fluid Dynamics Laboratory at Princeton University. Many of the scientists she knew there were working on global climate modeling. The greenhouse gas effect on atmospheric warming and oceanographic changes was well recognized.
4. See B.R. Barber, *If Mayors Ruled the World: Dysfunctional Nations, Rising Cities* (New Haven, CT: Yale University Press, 2013).
5. I paraphrase a notion taken from Brazilian social theorist Roberto Mangabeira Unger, who refers to the "dictatorship of no alternatives." See *The Left Alternative* (London: Verso, 2009). In the 1980s,

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Margaret Thatcher used the slogan, “There is No Alternative,” to promote her government’s policies of market de-regulation and privatization.

6. D. Kaiser and L. Wasserman, “The Rockefeller Family Fund vs. Exxon,” *New York Review of Books*, December 8, 2016, at <http://www.nybooks.com/articles/2016/12/08/the-rockefeller-family-fund-vs-exxon/>; D. Kaiser and L. Wasserman, “The Rockefeller Family Fund Takes on Exxon Mobil,” *New York Review of Books*, December 22, 2016, at <http://www.nybooks.com/articles/2016/12/22/rockefeller-family-fund-takes-on-exxon-mobil/>.

7. For a study of this movement in the 1990s, see C. Sirianni and L. Friedland, *Civic Innovation in America*, (Berkeley: University of California Press, 2001). I was recently informed by an administrator who works closely with graduating students at Yale Law School that interest in jobs in Washington, DC has fallen off markedly in favor of NGOs and agencies operating at the state and local levels, where it is perceived there is a greater likelihood of being able to make a difference.

Geronimo's Pass

By JAMES J. KRUPA

I am of a dying breed. I am a naturalist. We naturalists have an inexhaustible fascination with biological diversity and with organisms themselves, always wanting to know as much as we can about as many species as possible from first-hand experience. We are most happy when immersed in nature, far from concrete, asphalt, and steel. There was a time when the leaders of biology were naturalists: Charles Darwin, Alfred Wallace, Henry Bates, and Louis Agassiz. In the first half of the twentieth century, the infant science of conservation biology was advanced by great naturalists like John Muir, John Burroughs, Theodore Roosevelt, and Aldo Leopold. Biology has progressed beyond the study of natural history alone, as it should, but in the process naturalists have been largely left behind. Our decline is being hastened by the “nature deficit disorder” spreading throughout society and afflicting scientists as well. Many ecologists and some conservation biologists these days avoid nature, preferring the comforts of the lab perched in front of computer screens, gleaning data collected by those who still work outside.

But we naturalists feel most alive in nature. Occasionally, I have to escape the crush of humanity and lose myself in forests, swamps, and mountains, searching for species new to me and those that are old friends. Returning to civilization, I lapse into a period of depression. This phenomenon is commonly felt by

naturalists. President Roosevelt experienced this every time he returned from the wilderness to the White House, anticipating his next chance to escape: “He must long greatly for the lonely winds that blow across the wilderness and for sunrise and sunset over the rim of the empty world.”

There are drawbacks to being a naturalist. Watching the increasing loss of habitat and biodiversity hurts me deeply. As Aldo Leopold’s famous quote goes: “One of the penalties of an ecological education is that one lives alone in a world of wounds.” For me, each extinction is a deep wound that does not heal. As the rate of extinction accelerates globally (possibly over one hundred species per day), wounds accumulate. The first of these was in 1979 when the black-footed ferret was declared extinct after the last one died in captivity. I found it incomprehensible that this prairie dog-hunting weasel that once roamed my home state of Nebraska was gone. A time was when I roamed prairie dog towns in western Nebraska wanting to believe that somewhere below me, these ferrets were asleep, waiting to resume their nocturnal hunt. After the 1979 declaration, I was heartbroken. But sometimes, the extinct return. On a dark September night in 1981 near Meeteetse, Wyoming, a ranch dog named Shep presented a dead black-footed ferret to his owners, Lucille and John Hogg. A small population was then found nearby and the recovery effort was underway. I cheered the rediscovery and followed the captive

breeding program closely. Currently 1,200 wild-born ferrets live in eight U.S. states, Mexico, and Canada. They remain endangered and still face great risks, but they exist. I hope to see one someday.

Now I roam the wilds of North America hoping to see rare species before they are lost forever. In the Florida panhandle, I frequently visit a bog where steam rises with the morning sun, leaving me sweat-soaked and swarmed by flying, biting insects. Here I feel most alive. A delicate, translucent green carnivorous plant, Godfrey's butterwort, grows around me, while a family of red-cockaded woodpeckers scolds me overhead from the crowns of longleaf pines; the butterwort and woodpecker are federally endangered. Nearby, threatened Sherman's fox squirrels scramble up the trunks of pines, sending down showers of bark scales. These are huge and spectacular squirrels that come in many colors. Some are black with white masks; others are gray with black faces. All these species are in decline as ancient stands of longleaf pines and their associated bogs are devoured by logging and development. For a time, I forget my wounds standing in that bog, surrounded by these rare life forms. How much longer they will exist is uncertain.

When in Florida, I am exuberant watching our largest and showiest birds (white ibis, brown pelicans, great egrets, snowy egrets, wood storks, and many others) knowing they all faced imminent extinction until President Theodore Roosevelt provided them protection and sanctuary with his decree "I so declare it."

I am constantly tugged by an urge to roam wild places in search of the rare and threatened. I want so see them all while I can. For days and weeks at a time, I have wandered North America for this reason. In 1991, when still young, I set out on a three-month, eighteen-thousand-mile trip that took me through all the western states, from the Arctic Circle of Alaska to the Mexico border. My rusty, little yellow 1981 Ford Courier pickup truck was packed and ready to be my home and laboratory during the journey. It was pushing 150,000 miles and had been with me for many adventures from northern Maine to Key West to the Olympic Peninsula. The truck's dented white aluminum topper functioned as my shelter, protecting me from the wind and rain as I slept.

My plan was to end the trip in southwestern New Mexico to search for the very rare white-sided jackrabbit. Southern Hidalgo County is in the bootheel region of New Mexico along the Mexico/Arizona border. This is where the white-sided jackrabbit lives. It's a big jack

that looks like a small deer. It is tall, long, and lanky, pushing six pounds. White-sided jackrabbits are built to live in desert heat. Huge six-inch ears function as its cooling system with a network of tiny blood vessels that rapidly release body heat during the hottest days. Its long, spindly legs help release heat as well and provide the rabbit with a very long stride needed to outrun predators. Of the seven species of North

“A growing national attitude that our border with Mexico should be more secure, with high-tech walls and fences, is a major problem for wildlife.

American jackrabbits and hares of the genus *Lepus*, this one is unique. When it runs, large white patches of fur flash on its sides, creating a striking visual effect as a warning signal to other jacks. This species has always been rare and is becoming rarer as its numbers decline in the United States and Mexico. White-sided jacks need open desert grassland dominated by buffalo grass, nutgrass, flatsedge, wolftail, blue grama, black grama, and tabosa grass. This critical habitat is being lost as fire suppression and overgrazing cause dense scrub thickets to spread. These thickets favor the much more common black-tailed jackrabbit and create barriers preventing gene flow between already small populations of the rarer jack.

My desire to find this jackrabbit was pressing. A growing national attitude that our border with Mexico should be more secure, with high-tech walls and fences, is a major problem for wildlife. Border walls prevent wildlife from moving between the countries, restricting critically important gene flow between populations. The potential for extinction increases when genes can't flow and genetic diversity declines. Even border fences are problematic, as the parallel roads used by fast-moving Border Patrol vehicles kill endangered animals as they cross the road moving between the two countries. Both of these create problems for already threatened species straddling the border. These political winds are putting white-sided jacks at a greater risk of vanishing forever. If I did not see one soon, I might never.

Historically, the Animas and Playas valleys in the bootheel, with their diverse assemblage of grasses, were the white-sided jackrabbit's only home in the United States. I arrived in Animas Valley mid-afternoon in the scorching heat. The valley was harsh and hostile. I could not escape the intense sun, the hot wind was relentless, the earth was dry and hard

as concrete, and the grasses were brown. I felt unwelcomed. I drove highway 338 south from Animas to Cloverdale as it transformed from asphalt to a rough, dusty dirt road. Driving was slow as I bounced over the road's severe washboarding. An old sign indicated I had arrived at Cloverdale—a ghost town where only the weathered, abandoned general store still stood. I pulled close to the building, wedging the truck into the thin band of shade it provided. With binoculars, I scanned the valley.



Pronghorn roaming Animas Valley

Five miles to the south, a three-strand barbed wire fence marked the United States-Mexico border. Somewhere out there, hidden in clumps of tobosa grass, a white-sided jackrabbit was hunkered down in a depression it had scraped into the hard earth for a scant bit of shade. Here it would wait for dusk to arrive. I sat on my truck's tailgate in the shade of the general store, waiting for the long shadows of the Peloncillo Mountains to the west to fill the valley, telling the rabbit it was time to forage. All I could do was wait. I rolled my sleeping bag out in the back of the truck to sleep, but blowing dust and heat made it difficult. As the sun dipped behind the Peloncillos, the heat broke and the wind died down. It was time to begin an age-old ritual of naturalists. It was time to night ride. This involves driving the roads slowly with high beams on, watching for animals on the road. A spotlight is at the ready to follow animals trying to escape into the darkness beyond the lights. With luck my lights might catch the white sides of a big rabbit. I slowly drove the dirt roads of Animas Valley as night fell, kicking up clouds of choking dust behind me. Desert cottontails darted across the road. Occasionally my heart would convulse as a black-tailed jackrabbit ran into the road; each time I looked for white fur. Each time it wasn't

the rabbit I was after. I continued roaming the roads until I was exhausted. Around 2:00 a.m., I returned to the Cloverdale store and rolled out my sleeping bag for a few hours of sleep. At 5:00 a.m. I resumed the hunt, driving the roads until the heat of the day consumed the valley, sending jackrabbits back to their depressions hidden amid clumps of grass. By mid-morning there was nothing to do but explore while waiting for dusk.

I roamed the dirt roads of Animas Valley, exploring each. I came upon one marked "Geronimo Trail" heading west up into the Peloncillo Mountains. Curious, I followed as it began to rise out of the valley. A brown wooden sign with engraved white letters read, "Entering Coronado National Forest." I proceeded into Clanton Draw, a canyon filled with large oaks and alligator junipers. Steep slopes on either side were littered with rocks and boulders. Rock squirrels with their big bushy tails bounced across the road, scrambling for cover. A magnificent bird called the elegant trogon, with iridescent green wings and a bright red breast, croaked at me as I drove by. This is a bird I had not seen before.

Clanton Draw, I learned later, is named for a family that built a cattle ranching empire in the region, but this family did more than ranch. The Clantons (Newman "Old Man" Clanton and his sons) were also smugglers, robbers, cattle rustlers, horse thieves, and murderers belonging to a loose association of lawless men known as the "Cowboys" that included Johnny Ringo and Curly Bill Brocius, among others. The Cowboys gained notoriety for carrying out two brutal ambushes. The first was in 1879, stealing cattle from Mexican Federales; the second was in 1881, stealing silver from Mexican smugglers. The Cowboys were at their peak in 1881. Their decline toward extinction began when the Mexican government retaliated with their own ambush in August 1881, killing Newman and four other Cowboys.

These events are not why we remember the Clantons today, nor is it because Ike and Phin Clanton were probably involved in the attempted assassination and crippling of Virgil Earp and the murder of his brother Morgan. We know the Clantons because of thirty bloody seconds that occurred around 3:00 p.m. on October 26, 1881, when five Cowboys (Billy Claiborne, Ike and Billy Clanton, and Tom and Frank McLaury) faced off with John Henry Holliday and three Earp brothers (Virgil, Morgan, and Wyatt) on a street in the boom town of Tombstone. These two groups of men

had strong opposing political views on many issues and simply did not like each another. The Earps were Republicans who favored fencing the rangeland. The Clantons were southern Democrats who wanted open range. These opposing views in part led to the gunfight that left Billy Clanton and the McLauray brothers dead. It was a strange day in Tombstone, for a thin layer of snow covered the town. It was said that as school let out, the children were led home by a different route, as their normal path was covered with blood-soaked snow from the fight.

In the days and weeks that followed, Wyatt Earp retaliated for the ambushes on his brothers that happened after the gunfight and in the process killed more Cowboys. The gang's extinction came in 1887 when Ike and Phin Clanton were served warrants for cattle rustling. Phin was arrested, while Ike was shot dead for resisting.



Geronimo Trail in 2015 at the pass below Geronimo Peak

I emerged from Clanton Draw slowly climbing Geronimo Trail. The trail was littered with loose rocks, some as large as bowling balls. Swerving to avoid one would cause me to collide with others, each one pounding the undercarriage of my truck. Deep ruts and wash outs made driving miserable. I wanted to turn back but pushed on. The trail reached a crest and immediately plunged down a steep slope toward Arizona. Massive rock formations towered on either side, with steep rock-strewn slopes spilling down to the trail creating a mountain pass. The taller formation to the north was Geronimo Peak. Frazzled from the ascent, I pulled over to admire the view. To the west, a deep, hazy San Simon Valley spread out to the horizon with the purple Chiricahua Mountains off in the distance. The slopes around me were stippled by the many shades of green of bunch grasses, cacti, yucca, agave, and sotol. The

pass was peaceful and serene. A gentle breeze flowed, making it cool and comfortable. I pulled out a National Forest Service map to orient myself. It was then that I saw the name "Skeleton Canyon." Skeleton Canyon, just to the north of the pass, connects Animas Valley to the San Simon Valley. Smugglers moving up from Mexico into the United States have used this canyon for over a hundred years. It has a dark history. This is where the Cowboys carried out the two ambushes in 1879 and 1881 that would cost Old Man Clanton his life. In 1883, a band of Chiricahua Apache surprised troops of the U.S. Fourth Cavalry in the canyon, killing three, then burning their wagons and supplies, driving off their horses. But the most historically significant event happened on September 4th, 1886, where the canyon opened into San Simon Valley.

During the nineteenth century, the U.S. and Mexican governments expanded into the tribal lands of the Apache, displacing them and leading to the decades-long Apache Wars. Goyaałé, leader of the Bedonkohe band of Chiricahua Apache, was the last warrior chieftain to surrender to the U.S. government. Mexican soldiers called him Geronimo. In 1858, when most of the warriors were away, Mexican soldiers attacked Geronimo's band, killing his mother, wife, and three children. For nearly three decades following, Geronimo engaged in revenge attacks on Mexicans, killing hundreds. During 1885 and 1886, thousands of U.S. and Mexican soldiers pursued Geronimo and his band through the canyon lands of southeast Arizona and northern Mexico. Growing fatigued from constant pursuit, often hiding in Skeleton Canyon, Geronimo finally surrendered at the canyon's mouth.

With this, the United States declared the nation's Indian Wars over. The Apache were eradicated from the region as Geronimo and what was left of his peo-

ple were packed into boxcars under squalid conditions and shipped out of his homeland.

Geronimo's last words were: "I should have never surrendered. I should have fought until I was the last man alive."

For the rest of his life, Geronimo was a prisoner of war kept in Florida, Alabama, and finally Fort Sill, Oklahoma. Geronimo became a national celebrity appearing at fairs, including the 1904 World's Fair, wild west shows, and President Theodore Roosevelt's 1905 inaugural parade. Despite his celebrity, Geronimo was never allowed to return to his tribal lands. In his autobiography, which was dedicated to President

Theodore Roosevelt, Geronimo asked that his remains be buried in the land of his people: “It is my land, my home, my fathers’ land, to which I now ask to be allowed to return. I want to spend my last days there, and be buried among those mountains.” This request was ignored. Geronimo’s last words were: “I should have never surrendered. I should have fought until I was the last man alive.”

There, on a pass that was once Geronimo’s, I imagined the horror the Apache faced as an overwhelming force arrived without invitation or explanation and took everything. I understood why Geronimo fought back for so long; he was trying to keep his last position—freedom. As a naturalist being left behind by science, I felt a slight connection to Geronimo, understanding what it is like to be cast aside by a changing world.

The competitive exclusion principle is an ecological phenomenon that occurs when more than one species tries to occupy the same niche. The winning species will gain control of the resources; the loser is forced to leave or go extinct. This principle applies to competing human cultures, too, and has been an ugly part of human ecology for as long as humans have existed. With the elimination of the Apache, the United States turned its attention toward other competitors that were eating its livestock and game. Mexican gray wolves, grizzly bears, and jaguars were soon eradicated, leaving European Americans alone in the niche of top predator.

I sat there at Geronimo’s pass thinking about all the species we extirpated in the past, knowing the future would be more of the same. I mourned for the creatures we eradicated from the region and imagined a day when they roamed the valleys below me. Longing for the past, I felt a connection to all species now gone. It seemed most appropriate that I should camp at the pass. The view itself was reason to stay. With the gentle breeze still flowing over the pass, I napped in the back of my truck in preparation for another round of night riding. As the sun began to dip, I awoke and began the slow descent down the mountain to resume my search for white-sided jackrabbits. As I reached Animas Valley, a fierce thunderstorm erupted over the Peloncillos, bringing violent wind and rain. I stopped on the trail to wait out the storm; my truck rocked as it was pounded by driving rain. I was elated with this unexpected event. Animals are particularly active following early evening storms. Jacks would be active as well.

By the time the storm passed, Animas Valley was dark. The dusty, washboard roads were transformed into sheets of slimy mud. Hitting the brakes caused the truck to slide sideways before stopping. Hitting the gas caused fishtailing, as my spinning tires sprayed mud everywhere. My truck was quickly covered. As expected, rabbits were active and bouncing about. Desert cottontails zigzagged across the road trying to escape my headlights. Jacks crisscrossed in front of me, kicking up mud like race horses on a wet track. Each jack caused my heart to jump, hoping to see a flash of white. Black-tail, black-tail, not sure! With each “not sure,” I hit the brakes and slid, directing my spotlight towards the jack now hidden by the night beyond the road. Another black-tail. The tires spun as I resumed the search. Dozens of jacks galloped across the road, none of them glowing white. Water-filled road ruts were clogged with male toads in breeding frenzy. Great Plains toads, red-spotted toads, Couch’s spadefoot toads, desert spadefoots filled Animas Valley with their cacophony of calls. For weeks and months these toads were dormant, buried beneath the desert hardpan, waiting for this thunderstorm. This was their narrow window to breed. Time was short and the orgy would last a single evening. Then the race would begin as the tadpoles hatched and scrambled to eat enough and grow fast enough to transform into toadlets and escape the drying pool.

Black-tail, black-tail, another black-tail. Kit fox! I slammed on my brakes, almost sliding off the road as this yellowish, cat-sized fox with giant erect ears trotted across the road. It froze for a moment, looking directly into the headlights, then fled for darkness. My spotlight followed it as it ran, looking back, frustrated by my intrusion. Finally it escaped beyond the light and was gone. This is a species I had not seen before. Elated and hopeful, I kept driving.

Snakes, too, were active, gliding across the road: long-nosed snakes, glossy snakes, night snakes, and western diamondback rattlesnakes. Then I saw a small, unfamiliar creature slowly crossing the road. I slid to a stop for a look. It was a tarantula hawk, dragging a victim. This is a giant wasp with bright orange wings and metallic blue body. It hunts tarantulas larger than itself. Once found, the spider is stung, causing permanent paralysis. The helpless spider is then dragged to a hole where it is buried after the wasp lays an egg on its victim. Over time, the wasp’s larva will devour the helpless, living tarantula and transform into an adult. I slowly approached the hawk hoping for a decent pho-

to. It dropped the spider, stood up on four back legs, and locking its eyes on me. Unnerved by having an insect make eye contact with me, I got back in my truck. The hawk resumed dragging its prey. I waited for it to cross the road, then proceeded.

Soon I was back on roads I had already driven. More and more, large tire tracks were appearing, clearly not mine. Others were driving the roads. It seemed an odd time for anyone to be out. Then I saw a six-foot diamondback rattlesnake writhing in the road. It was just run over, leaving it with a crushed spine and internal organs sprawled out over the mud. It was dying, so I carefully put it in a bucket, then into the back of my truck. It would make for a fine teaching specimen demonstrating the anatomy of a venomous snake once the skull was cleaned and the skin tanned.

As the evening wore on, black-tailed jackrabbits continued to run in front of me. Still nothing with white sides. More large tire tracks appeared on every road. Suddenly something glowing white was lying in the road. It was a mammal. I hit the brakes and jumped out while the truck was still sliding to a halt. Slipping and falling on the muddy road, I ran sure it was a white-sided jack. When I got to it I was both disappointed and relieved. It was a kit fox that had just been hit. Its whitish-yellow belly glowed in my lights. I am always conflicted when I find road kill—saddened that another marvelous creature is dead, yet elated that I'm the one to find it. It will be a tremendous teaching specimen; the study skin demonstrating the huge ears of a desert-adapted mammal, and the skull that of our smallest North American canid.

Exhaustion got the best of me. After seeing over forty black-tailed jacks and over fifty desert cottontails, I needed some sleep to resume the search in the morning. I made the slow climb back up to the pass. It was two in the morning.

In the summer, processing fresh road kill must be done soon before decomposition begins. Sleep had to wait. I set up my field lab by flipping down the tailgate as a bench; turning over the plastic bucket provided a stool. I set out my skinning tray with scalpel blades, scissors, and forceps. I placed a hefty pile of cornmeal on a tray to soak up blood and fluids. I laid out my meter stick and notebook. With a bright headlamp centered on my forehead, I began making notes—date and location found, sex and weight, body and tail length, and, for the fox, length of hind foot and ear. The data tags I filled out would be attached to skins and skulls. I have skinned hundreds of animals in my life and have

become very fast. Before long, a pile of fur sat on the tailgate next to a pile of scales. Two skinless heads sat next to these, and a couple of carcasses were piled on the ground. The vultures would be most pleased in the morning. Arms smeared with reptile and mammal blood, I was sealing the two skins in plastic bags, ready to place them on ice, when my concentration was broken. I could hear vehicles coming up the trail from Clanton Draw. They sounded big and they were moving fast. Then I heard vehicles on the Arizona side.

Something was wrong and I was alarmed. Was someone being chased? Why would vehicles be on such a rough road at 3:30 in the morning? I stood in the road listening. Whatever was to happen when they arrived, it would look bad to have arms covered with blood. I frantically washed the blood off with wet

“I sat there at Geronimo’s pass thinking about all the species we extirpated in the past, knowing the future would be more of the same.”

rag, not realizing some was on my face. My t-shirt was smeared with blood as well, so I turned it inside out and put it on

backwards. The vehicles were louder and getting closer. I wanted it to look obvious that I was a biologist camping on the pass. I rolled out my foam mattress and sleeping bag and laid out my pillow. I leaned my butterfly net against the truck in plain view. I spread out my field guides to birds, butterflies, reptiles, and amphibians on the tailgate next to camera and binoculars. My heart was pounding and I was shaking with fear. Something wasn't right.

The sounds grew louder. I became frightened. Are they after me? Am I about to get robbed, beaten, my truck stolen? With this my fight-or-flight response kicked in. This is a physiological response and evolutionary adaptation in which, in response to fear, the body is prepared to either escape or fight. The nervous and endocrine systems spring into action as the hypothalamus, pituitary, and adrenals kick into gear, dumping the hormones ACTH, norepinephrine, and epinephrine into the blood. Heart rate and breathing accelerate. Blood vessels constrict in the skin, sending blood to the dilated vessels of the muscles where a boost of oxygen is needed to run or fight. The body begins to shake. Blood clotting chemicals increase in preparation to reduce blood loss from wounds. Hearing and peripheral vision waver. My body was ready for whichever action I would take.

I chose flight. I started scrambling up the slope

towards Geronimo Peak. I stopped, ran back to the truck, grabbed my twelve-gauge double barrel shotgun, and headed back up the slope. I stopped again and ran back to the truck to grab my camera. Back up the slope I went. For a third time I turned back to lock the truck doors. Then an internal voice said, "Stay!" The little truck had been my home for three months, and everything inside was precious to me. I couldn't leave it. I slid the loaded twelve-gauge under my sleeping bag, stalk pointing toward me. I loaded the twenty-two-caliber revolver and slid it under the bag as well. I locked my elbows, then leaned back on my palms, my fingers on the shotgun and the revolver. One voice said "Run, fool!" while another kept saying "Stay." The vehicles got louder and closer. My heart raced faster. I was shaking badly. Run, fool! Stay.

Suddenly I was blinded as vehicles swerved off the trail, directing their high beams into my eyes. All I could hear were big engines roaring. I slowly removed my left hand from the shotgun to cover my eyes, right hand still on the revolver. The vehicles sat idling, blinding me. We all sat and waited. Finally, I heard a door open and boots on gravel. My finger was on the trigger of the revolver. Then, over the sound of engines, I heard the crackle of a dispatch radio and the sound of a distant voice. I felt a sudden surge of relief. Someone of authority. An imposing silhouette of a man stood between me and the headlights. Then a voice: "Let's see some ID." I took my hand off the hidden revolver, fumbled in my wallet, then held out my driver's license. A long arm covered in a brown sleeve reached down and took my license. I heard a door close, the crackling of a radio, and muffled voices. My relief was suddenly replaced by another rush of fear. Did I do something wrong? Then horror replaced fear. I had loaded weapons, possibly not well concealed, behind me. Leaning back I slowly pushed the guns farther under the bag. I sat and waited. Eventually I heard a door open and a stern voice asked, "What are you doing here?"

I began to babble without taking a breath. "I'm a biologist. I'm here looking for rabbits. I've been picking up road kill. I have a dead fox. I have a dead snake. Do you want to see?" A long silence followed.

"A biologist?" Another long pause. The long arm extended out from the lights with my license, and the voice spoke these words: "You picked a bad time to be here."

Silence. Then doors closed and engines revved as red tail lights slipped down the trail toward Animas

Valley. I sat on the tailgate, shaking as the sound of vehicles faded away. "A bad time to be here!" I sat in the silence pondering these words. Eventually my heart slowed, the epinephrine ebbed, and I stopped shaking. Consumed by fatigue, I collapsed onto my sleeping bag and fell asleep. I don't know when, but in the darkness I was jolted awake. I felt the truck move ever so slightly. I heard and felt the truck door's latch lifted, then released. Then footsteps. Again, epinephrine surged and my heart raced. I didn't move. Should I yell? Should I jump out of the truck waving my shotgun? Should I run? I did not move but listened until it seemed whoever it was left.

Feeling vulnerable in the back of the truck, I slipped out without a sound, slowly slung the double barrel over my shoulder and quietly crawled up the slope towards Geronimo Peak. There was just enough star light for me to see my way. I reached a large boulder protruding from the slope two-thirds of the way up. I sat down, leaning against it. I could make out the dim shadow of my truck. If anyone approached it, I could safely fire the shotgun in the air to scare them away. There I sat waiting for dawn. There was no movement below.

Eventually, the first hint of gray appeared in the east, and I could make out my truck and the trail more clearly. Feeling I was no longer in danger, I scrambled down to my truck and headed for the valley. I was numb from lack of sleep.

By the time I reached Animas Valley, color was returning. Jacks would be finishing a night of foraging and heading back to their depressions to sleep. I parked at the Cloverdale store. With camera and binoculars, I began meandering my way south to Mexico, hoping to kick up a white-sided jackrabbit. Since night riding failed, maybe walking would bring success.

Immediately a jack bounced up from the grass. A black-tail. I was exhausted to the point of feeling dizzy but determined to walk the five miles to Mexico. My little truck grew smaller behind me. With binoculars, I could see the barbed wire border draw closer. I meandered from right to left as I walked. Stopping from time to time, I looked around for ears of big rabbits moving above the grass. With my binoculars, I looked forward to the fence, then back to my truck. It was not much more than a yellow speck. Slowly, on tired wobbly legs, I kept going.

Again, I looked back at the truck. Something was different. Something shinny and white was next to it. I stood amid the desert grasses wondering what to do—

head south or turn back. Concerned, I turned back. As I got closer, I could see a white Blazer with a bold green stripe. In the stripe were two words in bold white letters: “BORDER PATROL.” Now what have I done? As I approached, I could see an agent leaning against the Blazer. Reluctantly, I continued. Reaching the road, the agent sprang from his vehicle approaching me at a brisk pace. With broad smile and hand extended, he gave me an enthusiastic hand shake and a hearty hello. The agent said “You gave us quite a chase last night. I wanted to congratulate the elusive biologist.”

I was confused until I realized that overnight, I had become a celebrity. I had questions, and the agent filled in the details. Local ranchers reported someone in a small truck behaving strangely. They reported this to the Border Patrol and the Hidalgo County Sheriff. Agents and the deputy sheriff fanned out to find me. It was the deputy sheriff who talked to me on the pass. Somehow, I had eluded them in the night. Those were their fresh tire tracks. The snake and fox were their road kill. It ended when they sandwiched me in on Geronimo’s pass. I was told drugs were smuggled into the United States from Mexico by foot here and that August is a month of heavy trafficking. Ranchers are especially edgy about strangers this time of year. I stood out the moment I arrived in the valley. The agent said the valley is becoming more dangerous. He said that in the future I should check in with the County Sheriff and be careful where I camp. We shook hands and he departed.

Alone, I sat on the tailgate looking out over the valley, thinking about the conversation, still wondering if someone was at the truck the night before or if it was my imagination. All the while I was scanning the grass for a white-sided jack. I wanted to stay another night, but I was tired and my truck was beaten up. It was two hard days at the end of three exhausting and exhilarating months. I was spent. It was time to return to civilization, despite the fact that the thought of doing so was depressing. I promised myself I would return soon to look for the rabbit. It was a broken promise.

In May 2015, twenty-four years later, I returned to Animas Valley with the intention of staying the night to search for white-sided jackrabbits and camp on the pass. I felt even more unwelcome this time than I did on my previous trip. I drove past fifteen Border Patrol vehicles—each agent watching me as I passed. “No trespassing” signs were in abundance. My New Mexico bird finding guide was on the dashboard, open to the page for Animas Valley, which had a highlighted

warning: “It is important that you bird only from the road while in the Animas Valley. Be aware that virtually all of the land is private property and some landowner will have trespassers arrested.” Signs along the road warned, “Border Patrol Agents use South Road.” I turned onto Geronimo Trail, headed for the pass. Yet another sign greeted me, “Travel Caution—Smuggling and illegal immigration may be encountered in this area.” It took me twenty minutes to make the slow, dusty drive up. A second travel caution sign awaited me at the pass. I pulled over to the exact spot where I had parked twenty-four years earlier. The sun beat down on me. A hot wind assaulted me. Quickly I was covered by swirling dust. I tasted dust and felt grit between my teeth. After only a few minutes, I left, dropping down into Clanton Draw to escape the wind. On the way down out of the national forest, I passed by two ranchers who stopped what they were doing while suspiciously watching me drive by. I surprised a golden eagle feeding on a jackrabbit carcass. The giant bird flew to a nearby fence post, also watching me with suspicion. I stopped and got out of the truck looking to see if I was alone. Knowing I could be charged for trespassing, I ran twenty feet off the road to identify the rabbit. It was a black-tail. Running back to my truck, my heart raced from fear of being caught. After only three hours, I left Animas Valley.

White-sided jackrabbits remain much on my mind. I have read everything written about them, and I have talked to those who know the rabbit best, especially Myles Traphagen, who completed a comprehensive survey of them in 2011. This is what I know about the white-sided jackrabbit: it is now extinct in the Playas Valley; since 1976, its critical desert grassland habitat has declined by over 50 percent, from 29,600 to 14,400 acres; shrub habitat, which favors black-tailed jackrabbits, is spreading; it is endangered in Mexico; there may be fewer than fifty individuals left in the United States; and the state of New Mexico considers it a threatened species, while the U.S. Fish and Wildlife Service does not list it as threatened or endangered. Thus, it is afforded no federal funding for protection; the 500,000 acres of the Animas Valley in which this rabbit lives are private land with an easement by The Nature Conservancy, yet there is no motivation for the land owner to develop a management plan for the rabbit; in 2005, an imposing Normandy fence with parallel dirt road for Border Patrol vehicles replaced the barbed wire fence across Animas Valley; the number of Border Patrol agents in the sector in-

cluding Animas Valley increased from fifty in 2000 to three hundred ten years later; biologists now avoid research in the border region, creating a knowledge gap; Border Patrol vehicles average hitting one jackrabbit per night in Animas Valley, and these killings probably include both species; efforts to enforce a twenty-five mile per hour nighttime speed limit in the valley for all vehicles to reduce road kill were met with strong local opposition and stopped; and, most importantly, the white-sided jackrabbit is in serious trouble.

I worry much for the white-sided jackrabbit and all the threatened border species. The political winds in Washington D.C. have transformed the entire border region, creating more problems for these species. Politicians do not consider how increased border security will harm conservation and management of endangered species. Rabbits are getting hit by government vehicles, jaguars and Mexican gray wolves can't disperse from Mexico to the United States easily with the new fences and walls. Gene flow between Mexican and U.S. populations of ocelots and jaguarundis is in decline. Thus, the recovery and survival of these species in the U.S. are being threatened. White-sided jackrabbits could be one of the easiest and cheapest species to save if we choose to do so. Myles Traphagen has made recommendations to accomplish this: establish a land management program that involves some combination of prescribed burns and controlled grazing on both sides of the fence to increase the needed desert grassland habitat and reduce shrub growth; mandate that Border Patrol vehicles go no faster than twenty-five miles per hour at night; develop a Border Patrol outreach program to help agents recognize white-sided jackrabbits to avoid hitting them and to record sightings and locations of these rabbits; transplant some of these rabbits to suitable grassland habitat in eastern New Mexico to establish a second population in case the Animas Valley population goes extinct.

Following the 2016 presidential election, environmentalists and conservationists are deeply concerned. During the campaign, Donald Trump vowed to increase border security with a forty-foot wall and even more border agents. Doing so will put the white-sided jackrabbit in even greater peril as more border patrol vehicles will hit more jackrabbits. A wall will destroy gene flow, preventing these jacks from moving between the two countries. If we are to save this rabbit, we must act soon. Since November, I have become deeply fearful for the white-sided jackrabbit's surviv-

al. Yet I have no choice but to desperately cling to the hope that this species can be saved. It does not compete with livestock or humans in any way. It does not eat our crops. Its flesh and fur are of no value. Sadly, the problem is that this rabbit is not glamorous, charismatic, or conspicuous, and too few care about it. But these are not reasons to let this species slip away into extinction. What white-sided jackrabbits need, like so many species facing extinction, are politically powerful people who care. What this rabbit needs is a Roosevelt to save it with the decree, "I so declare it." Only time will tell if this is a species I'll have a chance to see. Only time will tell if this is another species whose extinction I will mourn.

James J. Krupa is a professor of biology at the University of Kentucky who teaches the required evolution course for biology majors, in addition to courses in vertebrate biology and mammalogy. His research focuses on the ecological interactions between carnivorous plants and spiders.

Environmental Graphiti— Science>Art>Cause

By ALISA SINGER

I am a corporate lawyer turned environmental artist. It might be difficult to imagine how this transition came about, but for me the progression from one to the other made perfect sense.

When I was seventeen, I gave up my full-tuition university art scholarship only two days after beginning classes. I had suddenly realized that committing myself to a career in art probably would mean either lifelong financial insecurity or having to compromise the pursuit of art that interested me in favor of projects that would be of interest to paying clients. Neither scenario was appealing and so, based on some advice I received from a trusted uncle, I turned from my dream of becoming an artist to preparing for a career in law, though I had no idea what that meant and had never even met a lawyer. But I also made myself a promise: When I did achieve some level of financial security I would return to focus on my art.

For some thirty-five years I handled the legal aspects of various kinds of business transactions, from small acquisitions to multi-billion dollar mergers. I counseled clients on public and private securities matters, domestic and foreign private equity investments, and an infinite variety of other legal matters, working both in private practice and as in-house counsel.

Oddly enough, my legal career had a direct impact on my chosen medium for creating art, becoming the path by which I moved from working with acrylics on canvas to digital art. This happened when, for a few years during the recession that began in 2008, my parallel universes of art and law collided. At this

to a significant reduction in the activities of my employer. Job security required that I continue to appear busy and engaged, despite having hours on end with nothing to do. I began to amuse myself by writing humorous essays designed to appeal to female baby boomers. Eventually the essays were published in dozens of obscure newspapers and magazines across the country and in parts of Canada. (Oddly enough, despite my target audience, one of my most loyal subscribers was the largest publisher of magazines for truckers.) When I realized that editors loved illustrated articles, I began experimenting with painting software to add simple, light-hearted sketches to go with the pieces. I became intrigued by the infinite possibilities and flexibility of digital art. It remains my primary medium today, though I have long since given up my brief career as a writer.

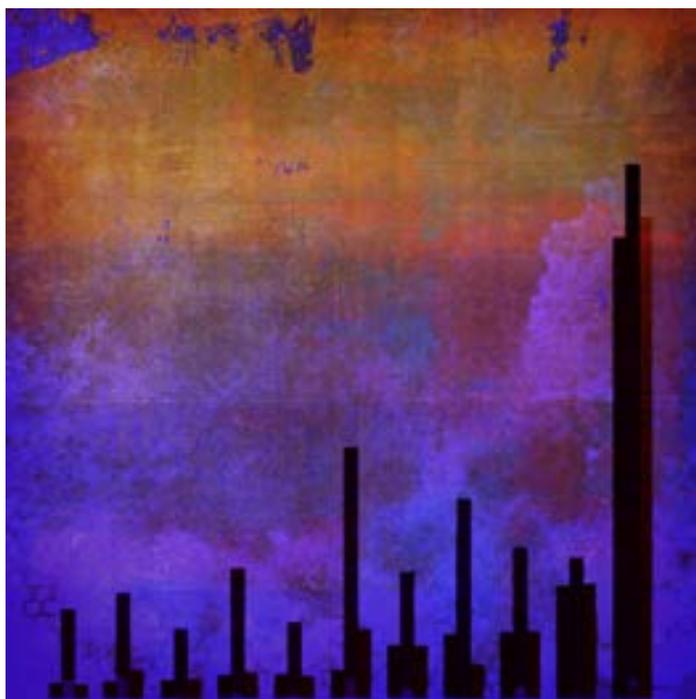
After I made the decision to retire from the practice of law I was ready to fulfill the promise I had made to myself decades before—to finally really devote myself to my art. But I was also very interested in incorporating some form of charitable work into my “second act,” something I had never found time to do while I was juggling career and family responsibilities. I challenged myself to figure out how to combine art with cause.

I began this journey by creating contemporary Braille greeting cards for the benefit of The Chicago Lighthouse for the Blind. For this project I used the actual Braille message (i.e., the patterns of dots) as the

principal design element of the image for each card. After a year I had designed over a dozen cards for different occasions. It was time to consider my next focus. I directed my attention to climate change, an issue about which I have for some time felt a deep concern and believe to be the most pressing challenge of our time.

I am more than a little bewildered that the general public isn't more alarmed about the compelling facts regarding climate change and how it is impacting our planet. A plethora of charts, graphs, and maps illustrating the science can be found with any Google search; the data tell an alarming story but, unaccountably, too many people are not paying attention.

I realized that many people might be put off, confused, or intimidated by graphic depictions of data and statistics. I conjectured, however, that those who would shun a presentation of charts and graphs might nonetheless be happy to look at bright, colorful art. It



occurred to me that art could become the vehicle for “delivering” the facts about our changing world or, more accurately, a non-threatening device to entice people, making them more receptive to learning a bit about the science.

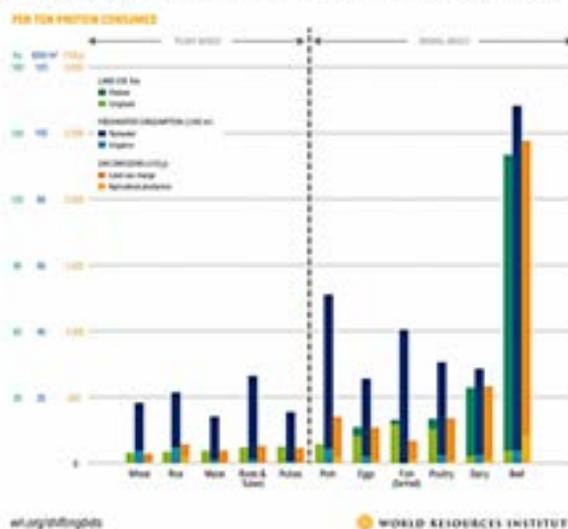
I set out to develop an approach to marry my art to this cause. This led me to found the non-profit venture, Environmental Graphiti, which has as its mission the use of art to enhance public awareness about the facts of climate change. The actual blueprint for each of the digital paintings in my series, “The Art of

Climate Change,” is a chart, graph, word, number, or symbol representing a key fact about climate change.

As I began this project, one obvious obstacle immediately presented itself—not only am I a self-taught artist, I also lack any background or training in science or statistics. (Please don't confuse this confession with the favorite disclaimer of climate science deniers, who often precede their denunciations about the validity of climate science with the statement: “I'm no scientist, but...”) As I reflected on this potential dilemma, I began to see my lack of scientific training more as a positive than a negative. Perhaps I was rationalizing, but it seemed to me that this shortcoming could be of benefit when making the point that the essential facts of climate change are completely available, and comprehensible, to anyone—no scientific background or expertise required. And that's terribly important because this is a problem everyone is, and will be, affected by in different and significant ways.

Less Red Meat = Greener Planet

Animal-Based Foods Are More Resource-Intensive than Plant-Based Foods



Decreasing meat eating could cut in half greenhouse gas emissions attributable to food production.

With this in mind, I turned my attention to the challenge of creating art from data. I was immediately drawn to the design possibilities of the geometric lines and shapes of scientific charts, graphs, and maps, finding these graphic elements to be both dramatic and persuasive. The impressive trajectories pointed clearly in one direction or the other, e.g., upwards, to reflect the inevitable correlation between temperature rise, carbon emissions, and rising ocean levels, or downwards to reflect the Arctic sea or land-based ice melt.

In addition, the many key indicators of climate change (including increased heat, intense storms, drought, famine, flooding, forest fires, risks to human health and marine and other forms of wildlife, and so many more), offer an endless variety of approaches to the presentation of the data. This gave me a broad, rich pool of source material to draw from. In fact, it was rather too much of a good thing.

Because of the overwhelming amount of data, it became necessary for me to bring discipline to the selection of each graphic. So I devised rules and criteria for myself: First, the data itself must be from a credible source (I prefer, when possible, U.S. government sources that have the added benefit of waiving copyright). Second, the information must represent an important fact that forms a part of the narrative of the series of artistic pieces, which collectively tell the story of climate change. Third, when I look at the basic design of the graphic, I must be able to visualize its artistic possibilities so that I can feel confident of creating an image that will stand on its own from an aesthetic perspective. (This is critical—people must find the art appealing, and be drawn into it, in order to be more receptive to the underlying message.) Finally, I favor simpler graphics that allow me more artistic freedom to develop. (Some graphics are so beautiful and artistically evolved that there is little for me to add. I prefer to use only the most elemental aspects of the graphics in providing the “canvas” for a piece.)

Once I select a graphic I scan or download it and, using a variety of design software (none of which I have any actual training with), I begin to paint and manipulate the image until it becomes a work of seemingly abstract art. This is very much an exercise in “happy accidents”—I can never reproduce a particular image and generally don’t know exactly how I created it. As an untrained artist, much of the pure joy of the process of creating digital art derives from stumbling upon effects, which I keep or discard as my intuition dictates. In this way the painting evolves. (Another of the great joys of digital art is the fact that you never have to clean up afterwards—no paints to put away or brushes to wash.) Still there is some method to my madness—the decisions I make as I create the art are designed to control how the art is ultimately experienced by the viewer.

Each painting is displayed with a plaque depicting the underlying climate data source and explaining its significance. Once the viewers realize they are not looking at mere abstract images, they are intrigued

and a kind of “double take” will occur. Moving back and forth from art to graph, and from one piece to the next, they try to decipher how the data is reflected in the art. As a result of this process, the viewer becomes more engaged in both the art and the underlying message.

With this process in mind, I try to create each painting so that it is independent of the science it is derived from, making the ultimate reveal of the source data more unexpected and dramatic. What I mean by “independent” is actually two things: First, as I mentioned above, the art must meet my own aesthetic standards so that it will attract people to want to see and exhibit it on its own merits. Second, the image should not hint too obviously at the substance of the fact from which it is derived because I want the art to be more than just an artistic illustration of the science. So when I begin to work with a graph or chart, I try to reduce it to its basic design elements without regard to its meaning, and then I build from there. Sometimes, though, I allow something of the underlying science to seep through—for example, in my choice of the color orange for a painting about heat, or wild, wavy lines in a painting about the risk of future global conflict resulting from constrained environmental resources.

The art is intentionally designed to be bold, vividly colored, and striking. When exhibited, it is typically printed on a large piece of glossy metal to attract attention and draw people in. And to appeal to as many people as possible, I try to employ a wide range of styles while retaining for each the feeling of a contemporary abstract work.

As the series evolved, I began to add paintings based on sketches. Instead of drawn lines, these paintings use a word, number, or symbol of specific significance to climate science. For example, one sketch uses as its sole design the numbers 2 and 3.6 to represent the degrees in Celsius and Fahrenheit that climate scientists have warned us not to exceed (though it now appears clear this boundary will be exceeded). One painting is based on a sketch of the word “deforestation,” another of the word “drought.”

Early on, one of my Environmental Graphiti colleagues, Julie Stark, showed the art to a friend who became inspired to turn the images into a video in which the paintings are shown to “morph” back into the original charts and graphs, and then into art again. (Later videos based on this technique can be viewed on the Environmental Graphiti website.)

There are now over fifty digital paintings in the se-



A fifth of global greenhouse gas emissions come from forest clearing.



Word-image Deforestation Sketch

ries, loosely divided into three galleries: “Why is our climate changing?” “How is climate change affecting our world?” and “What can we do to address climate change?” The project has grown to include two very creative strategic advisors, Julie Stark (mentioned above) and Ellen Friedler—each of whom helps to guide the focus of the venture, acts as a critical “sounding board,” and seeks new opportunities for exhibition or use of the art—as well as others who assist and support the project in various ways.

In furtherance of its mission, Environmental Graphiti offers the art, at cost, to schools, universities, libraries, and other non-profits who mount temporary exhibitions or permanent displays or sell the art at fundraisers. We have exhibited the art in universities across the country, as well as in public venues such as libraries, and at various environmental events. And most unexpectedly, I was given the opportunity to adapt a painting to form the basis of the cover for the song “Love Song to the Earth,” featuring artists such as Paul McCartney, Jon Bon Jovi, Sheryl Crow, and others, with all proceeds to benefit the United Nations Foundation and Friends of the Earth.

Our brief experience with Environmental Graphiti has already proven the original hypothesis: art, science, and cause are a dynamic trio with synergies that enhance the qualities and impact of each. Art can serve as an inviting point of entry to make scientific information more accessible and comprehensible. Art derived from science is inherently unique and mean-

ingful, which makes it more engaging and satisfying. And art combined with science can effectively serve the cause of climate change awareness as a powerful tool to tell the story about how our world is being, and will be, impacted—a story that must be told by as many people and in as many ways as the imagination allows.

Alisa Singer is a self-taught artist who has, since her retirement from the practice of corporate law, devoted herself to creating art to further causes she believes are important. She is attracted by the inherently aesthetic design elements of scientific charts and graphs and is intrigued by the idea of using art to give them dramatic effect. To learn more about Environmental Graphiti and to see more of the art, please visit <http://www.environmentalgraphiti.org>.

What do Plants Mean?

By KATHRYN M. FLINN

As a college student, I was torn between two different worlds: literature and botany. Grasping at threads to connect them, I held on to the cultural meanings of plants, from the hazel and rowan trees of Irish myth and the jasmine and anemones of Arabic songs to Huysmans' arjuns, orchids, and bromeliads. Above all, I questioned how these plants had come to mean what they mean. In the Hebrew Bible, why does a particular plant called spikenard represent allure, or mandrake fertility, or hyssop purification? How had this specific significance grown out of biological reality?

During this time I started studying ginseng, a plant more invested with meaning than most. This species made the perfect study organism for an overly imaginative English major. Its fame originated in the Doctrine of Signatures, the principle common to the ancient world and famously expounded by Foucault, that plants resemble the body parts they were meant to treat. Walnuts heal the brain, and so on. Since forked ginseng roots looked like whole persons, ginseng must be a panacea. In fact, hundreds of pharmacological studies have documented multiple and complex effects, including anti-inflammatory and anti-cancer properties; ginseng is also used to treat diabetes and cardiovascular disorders, though clinical evidence is scarce. This medicinal use is the nub of ginseng's value in Asia, but around that grew a whole mythology involving tigers, lightning strikes, glowing roots, cherubic spirits. Trying to understand how and why ginseng inspired such myth-making, I dug deeply

into this cultural murk, to the evident dismay of my biology advisor.

But what I really wanted to know was what ginseng meant to Americans. Closely related to the legendary Asian species, American ginseng is native to eastern North America. Surely it meant something different and unique in American culture. Ginseng has played small roles in Native American and new age medicine. But as I pored over three hundred years of American writings on ginseng, I found that, in America, ginseng mostly only meant one thing: money. As the *Wall Street Journal* quoted one digger, "I never found it worth a damn for anything but to get money out of."

How disappointing. Like bison and beaver and so many other living things, ginseng had simply become a commodity. Its cultural meaning seemed divorced from its biology. But gradually the nuances of the story grew on me, and I realized that even if it brought the same price, a sack of ginseng would never mean the same thing as a bushel of corn or soybeans. The specific biology of American ginseng has colored its meaning as money. As the plant's distribution and abundance, ecology and evolution changed over time, its meanings as money changed, too.

In colonial America, commerce in American ginseng centered on the fur trading posts of Montreal and Albany. Gathering ginseng went along with hunting and trapping, and fur traders bought the roots. Indians exchanged ginseng for cloth, blankets, kettles, guns, and other technologies of an easier life, from fishhooks to thimbles. The ginseng made its way to Canton (now

Guangzhou) via French and British firms.

Indians near Stockbridge, Massachusetts, began selling ginseng in 1752. According to Jonathan Edwards, the trade led to decadence among his flock:

This has occasioned our Indians of all sorts, young and old, to spend abundance of time in wandering about the woods, and sometimes to a great distance, in the neglect of the public worship and of their husbandry; and also of their going much to Albany (which proves worse to them than their going into the woods) to sell their roots: where they are always much in the way of temptation to drunkenness, especially when they have money in their pockets.

American ginseng has some of the attributes of commonness—it has a large geographic range and grows in many kinds of habitats. The species occurs throughout eastern North America, from Ontario and Quebec to Georgia, and west to the states on the west shore of the Mississippi River. Ecologist Jim McGraw of West Virginia University, who has spent most of the last thirty years studying American ginseng, quantified its distribution across the central Appalachians. Despite the stereotype that ginseng prefers moist, base-rich, north-facing coves, he found it in all the elevations, aspects, and forest types he sampled.

But populations tend to be small. In 293,200 meters squared, McGraw and his students found only 539 ginseng plants. They concluded that American ginseng has an unusual form of rarity, in which it is widespread across many habitats, but nowhere very abundant. This is exactly the distribution one would expect for a plant that has been harvested for hundreds of years, especially in supposedly typical habitats, and especially in places where it was plentiful.

After the American Revolution, the ginseng trade was freed from British middlemen. The first American ship to trade directly with China arrived in Canton in August 1787, loaded with thirty tons of ginseng. It returned to New York with tea, silk, and porcelain, which made the ship's backers a 30 percent profit.

Both Britain and the States had trade deficits with China, paying for most of their tea and china with silver money. But ginseng enabled Americans to close the gap. American consul to Canton Samuel Shaw vaunted this advantage in a 1787 letter to Foreign Secretary John Jay. "While the nations of Europe are, for the most part, obliged to purchase this commodity [tea] with ready money," Shaw wrote, "it must be pleasing to an American to know that his country can have it

upon easier terms; and that the otherwise useless produce of her mountains and forests will in a considerable degree supply her with this elegant luxury."

Like their new country, many Americans found themselves cash poor and resource rich. In September 1787, while delegates drafted the Constitution in Philadelphia, John Mathews and his team were surveying the Ohio River valley. They camped at a river fork on a Saturday and stayed there to dig ginseng for four days. Mathews recorded that each man dug forty to sixty pounds of root per day. The next fall, Daniel Boone floated fifteen kegs of ginseng up the Ohio River from Kentucky to Pittsburgh. Roads between Pittsburgh and Philadelphia were clogged with wagons, pack-trains, and horses loaded with barrels of ginseng. According to botanist François-André Michaux, ginseng was the only product of Kentucky that could pay for its passage to Philadelphia. Each barrel would turn into a small fortune. Ginseng supposedly started the wealth of John Jacob Astor, America's first multi-millionaire.

The plant itself is unassuming. American ginseng is about fifty centimeters tall. Its tuber-like root sends up a single stem each year. A mature plant has three or four leaves. It may grow for five years or more before it starts flowering, and when it flowers, it produces a single inflorescence. The flowers are very small, greenish-white, and what wildflower guides call "inconspicuous." Tiny sweat-bees and syrphid flies visit the flowers.

Like many other herbaceous plants of forest understories, American ginseng has a classic "slow" life history—growing slowly, producing few, well-provisioned offspring, living a long time. In one population studied by botanist Mark Schlessman, most flowering plants had ten to twenty flowers, and the average plant produced four or five seeds per year. (By contrast, an invasive garlic mustard plant in the same forest can produce three or four thousand seeds in a year.)

These few seeds have low chances of making new plants. By marking and following four populations over multiple years, ecologists Danielle Charron and Daniel Gagnon estimated that only 1 to 15 percent of seeds became seedlings, and only 8 to 31 percent of seedlings survived. But once a seedling became established, it was likely to live for twenty years, or fifty years, or longer. All of this results in populations that tend not to grow or decline much, but remain the same size for hundreds of years, in the absence of disturbance. This is exactly the worst kind of organism to harvest, because populations can't rebound.

Until the late 1800s, American ginseng had not been cultivated as a cash crop, but the 1880s began a ginseng-growing boom. Agricultural weeklies, government bulletins, and practical handbooks gave detailed calculations of the potential profits: prices for seeds, seeds per ounce, plants per acre, roots per pound, prices of roots. Plant pathologist H.H. Whetzel wrote, “No wonder that a ‘Ginseng craze’ broke out and that men sat up nights to figure out on paper the vast fortunes that were bound to accrue to those who planted a few hundred seeds at three cents each and sold the roots in five years at \$12.00 a pound.”

George Stanton, “father of the cultivated ginseng industry,” was a tinsmith and small farmer in the Shawangunk foothills of New York State. Farmers in places like this needed a get-rich-quick scheme in the late 1800s. Commodity prices were falling, equipment debts were rising, banks were foreclosing on their neighbors. Planting ginseng meant self-sufficiency. In a Department of Agriculture publication, Maurice Kains recommended it as an adjunct to raising fruit or poultry. “The [ginseng] crop is one which can be grown incidentally to general farming without any great outlay of capital, and further, if there should be a temporary decline in price, the grower can leave his roots in the ground, knowing that they are improving in quality.” Kains followed his ginseng-growing manual with books on gardening, home canning, and animal husbandry, including *Five Acres and Independence*.

Ginseng populations tend to remain stable in the absence of disturbance, but of course the forests where ginseng grows have undergone a number of disturbances over the past three hundred years. Most of these forests no longer exist, lost to agriculture or development. The forests that remain have gained many species from Europe and Asia, including invasive plants. In a survey of thirty ginseng populations across seven states, Kerry Wixted and Jim McGraw found that about one third of ginseng plants were growing within a few meters of an invasive plant.

Since 1950, land-use changes, losses of predators, and game management have led to unprecedented increases in white-tailed deer densities. In seven West Virginia populations, deer ate 10 to 63 percent of ginseng plants and sometimes all the seeds. When Mary Ann Furedi and Jim McGraw fed ginseng seeds to deer and examined the scat, no seeds passed through. They estimated that without deer browsing, almost all of the populations they studied had a 95 percent chance of surviving for one hundred years. With current rates of

deer browsing, none of the populations were predicted to survive.

By the 1960s, most people saw ginseng as a relic of the frontier past, persisting only in backward-leaning parts of Appalachia. More specifically, it represented the lost economic opportunity of the frontier past. Americans were nostalgic for times when it seemed any pioneer or homesteader could make it on sheer grit and resourcefulness. Daniel Boone was on TV. *Five Acres and Independence* was reprinted as a back-to-the-land classic. Folksinger Norman Blake sang about a digger called Ginseng Sullivan hoping “next summer if things turn right/The companies will pay high.” But there wasn’t enough ginseng to justify hopes of a fortune, or even a living. In the song, Sullivan finds “a tow sack full of ginseng/Won’t pay no traveling bills.”

Eliot Wigginton, an English teacher in north Georgia, sent his students to interview older people about hide tanning, butter churning, and other disappearing “affairs of plain living” for a magazine that became the *Foxfire* books. They talked about “sang hunting” as one of few sources of cash “to pay taxes or buy a new gun or hound dog.” As digger Wallace Moore put it,

Boy, that’s a pretty sight to see...Walk up and see big wads of berries just scattered all over the side of the hill and in the holler. Well, I reckon it’s about every sang hunter’s dream—everybody that’s ever dug the sang or fools around with it any—is always a’looking for a patch where he can dig maybe two, three hours, three, four hours, or a half a day in one patch. Everybody you see: ‘Boy, if I could just find a patch where I could dig a half a day, I’d be all right!’ But them patches are scattered.

Working with Martha Case and others, I measured how much American ginseng has declined in abundance by looking at how many herbarium specimens botanists collected over time. Compared to its close relatives, ginseng collections declined from 1850 to 2000 in Vermont, New York, Pennsylvania, Michigan, Wisconsin, and Minnesota. Since ginseng and related species are affected in similar ways by deer, invasive plants, and habitat destruction, these declines probably resulted from harvesting.

If undisturbed, larger ginseng plants have higher survival rates and produce more seeds, which, if size is inherited, would cause plant size to increase over many generations. But both deer and people tend to take larger plants. From 1900 to 2000 the ginseng plants botanists collected declined in size, especially

height. Jim McGraw counted the annual bud scars on the rhizomes of these plants to determine their age, and the more recent specimens were not younger. Plants of the same age are now smaller and shorter than in the past. Smaller, shorter plants have less leaf area gathering light, so they have fewer resources and make fewer seeds. They contribute less to population growth, so populations of the same size may be less likely to persist.

In the twenty-first century, finding ginseng has become more difficult, and diggers less numerous and more desperate. In 2014, ginseng digging became bizarre and risky enough to debut on reality TV. Over spooky music and sounds of heavy breathing and fast heartbeats, *Appalachian Outlaws* follows diggers who trespass on private property and dig on federal lands without permits. They risk fines, jail time, and bodily harm for payoffs of \$550 per pound of root. “It’s powerful—it’s money,” one digger explains. But he’s not making fortunes. He doesn’t have a steady job. He talks about feeding his kids.

Shaky camera work shows a West Virginia landowner who protects his patch by waiting in the woods at night with a shotgun and installing a “hillbilly alarm system” of homemade land mines. He says his grandfather planted some of the plants. “This stuff means a lot to me,” he says. “I mean, that’s my retirement fund.”

Appalachian Outlaws doesn’t much reference conservation ethics, but some diggers do plant seeds. After collecting a motherlode of roots from one hillside, a digger says, “Well, I think I’ve raped it enough, really.”

Diggers, buyers, ecologists, managers all recognize the problem of scarcity. Trade in American ginseng is now regulated by the Convention on International Trade in Endangered Species, which took effect in 1975. Under this treaty, the Fish and Wildlife Service’s Office of Scientific Authority decides each year that the upcoming year’s harvest “will not be detrimental to the survival of the species.” This decision is based on an annual report from each state of how many pounds of root it exported. These numbers tend to track unemployment.

Many states have harvest seasons, intended to allow plants to produce seeds before being dug, and size limits, to let plants get big enough to produce seeds before being dug. Many states also prohibit harvesting in state parks and nature preserves. But when Jim

McGraw and his colleagues monitored harvesting in thirty marked populations, only 6 percent of harvests were legal in all respects. They warned that centuries of overharvesting have left Asian ginseng virtually extinct, and American ginseng seems likely to follow. If it does, diggers will be poorer, and Americans’ dreams of wild success or self-made security will be poorer, too.

The good news is that the meanings of plants are changeable, and we can change them. If ginseng can mean independence, or insurance, it can also have new meanings that respect its altered biological reality. Ginseng isn’t the only species disappearing—many biological communities are impoverished in diversity. If we leave it in the ground, perhaps ginseng can represent a new kind of savings against a leaner future.

Kathryn M. Flinn is a plant ecologist and Assistant Professor of Biology at Baldwin Wallace University in Berea, Ohio. Learn more at <https://kathrynflinn.wordpress.com/>.

VOICES FROM A NEW GENERATION— A SPECIAL FEATURE

Editor's Note: The following four articles, introduced by Jeremy Ohmes and James Edward Mills, are contributions by outstanding students whose voices enrich the ongoing conversation that is Minding Nature.

Questions for a Resilient Future Responses from Loyola University Chicago

By JEREMY OHMES

In fall 2016 the Center for Humans and Nature worked with two groups of undergraduate students at Loyola University Chicago to share their visions of a culture of conservation. The first group comprised a mix of environmental science and business students from a course called “Sustainable Business Management.” They responded to our question, “How can we create a successful economy without continuous economic growth?” and we are happy to share our favorite response here. You can view all of the student reader responses on the question page (<http://www.humansandnature.org/how-can-we-create-a-successful-economy-without-continuous-economic-growth#response>). The second group consisted of graduating environmental science students from the senior capstone course, “Integrative Environmental Seminar.” They drew from the scholarship and ideas they explored during their environmental studies to develop the following question for our Questions for a Resilient Future series: “What happens when we perceive ourselves either as separate from or as a part of nature?” The students then worked in teams to write responses to this question, and we are excited to share the winning response in this issue of Minding Nature. All of the students’ responses will be posted online in March 2017 when the full question series is launched.

We would like to thank Dr. Nancy Landrum from Loyola University Chicago for making this collaboration possible. We hope you enjoy these voices from the

next generation of environmental scholars, scientists, activists, and leaders.

Jeremy Ohmes is Communications Manager at the Center for Humans and Nature.

Everything has a Limit to Its Growth

By ALYSON CRUTCHFIELD

Can we have a successful economy without continuous economic growth? The current goal of economic growth is focused too much on the concept of gross domestic product (GDP) growth. GDP is defective in that it lacks a value system that differentiates the kinds of output it measures. Thus, an increase in jails due to higher crime rates, an increase in weapons due to political tension, and an increase in pollution due to manufacturing all are counted positively toward GDP growth. Since things produced that certainly do not signify positive changes are counted toward GDP growth, the idea that economic growth is beneficial is astoundingly misleading. It is a common belief that economic growth makes our economy successful, but economic success should be the reflection of the state of society. If unfavorable production is increasing in order for the economy to “grow” yet society’s well-being is decreasing, why is this the sort of growth that people desire? How is this considered growth at all? It certainly is not an accurate depiction of the state of society.

People’s choice to consume is to improve and ensure quality of life. The demands of all consumers that must be met first and foremost are basic needs like food, water, shelter, and health. The market’s purpose is intended to meet the needs of the consumers and at the very least abstain from doing anything that goes against the ability to meet these needs. Yet crop yields are diminishing due to mistreatment of land, fresh water is being polluted by industrial and agricultural processes, and health is declining due to exposure to pollutants in our air, water,

food, and products. Global warming is even taking away land and shelter, with the increase in sea levels and intense storms wiping out infrastructure and eroding coastal land.

Additionally, consumers in the developed world have the privilege of looking past basic needs. In the game of economic growth, the idea persists that more consumption is going to make consumers happier. This goal of consuming more puts a demand on more production, which is great for industry in a monetary sense. But it also means more extraction of resources and a piling up of waste. There is only so much an individual can consume and hold onto. Furthermore, companies often design products not to last, and it is almost a guarantee that an average American who consumes something will also be wasting that same product or a replacement of that product. What people fail to see and know is that after a certain point in consumption, levels of happiness are not increasing. In fact, Americans’ happiness level has not increased since the 1950s.¹ Yet economic consumption keeps growing. It is not making American consumers happier; it is inhibiting them from meeting their basic needs, especially in the long run. Moreover, health is declining. Consuming more is doing nothing but creating additional problems. It is not to the consumer’s benefit, especially since it is actually subjecting consumers to a poorer quality of life.

Although these problems negatively impact humans, consumers aren’t demanding a change because those causing the problem—the affluent global population—are not yet largely impacted. Thus

the citizens of developed countries do not realize the severity of the problem. As previously stated, a business's efforts are directed toward meeting the needs and demands of consumers in order to generate a profit. If consumers aren't changing their demands, businesses won't change either. However, the problems people face on this path of economic growth are inevitable. If the majority wait to be reactive to a crisis rather than pro-active to the situation already at hand, the situation will be much more difficult to take on, and many more people will suffer before it improves.

The answer is not for markets to cease to exist but for growth to stop at the peak point where its costs do not outweigh its benefits. Right now, our economy externalizes a lot of costs, such as environmental damage. Ignoring these externalities is why the economy appears able to keep growing—the market does not reflect those costs. However, if you make those externalities visible, the economy is actually moving on a downward slope where the costs significantly outweigh the benefits.

We need to retreat—to figure out how to go back to our peak and stay there. The success of the economy needs to be completely redefined. We can function sustainably, produce sustainably, and consume sustainably if we make putting a higher value on the health of the environment a priority. Instead of extracting resources and wasting them and the products we make from them, recycling and reusing would be the sustainable alternative. Resources need to be kept in the market, instead of allowing them to fall out and be wasted. Products need to be designed to be as durable as possible. Then, when products have come to an end of their life, they then should be repaired or remanufactured into a new product.

Everything in nature has a limit to its growth. We are foolish to make continuous growth the economic goal because it is scientifically impossible. There is no amount of monetary evidence that can be shown to justify what is happening to the health of humans and to the health of the planet. An average human in developed countries is very detached from nature, but that does not change the fact that humans are a part of nature. Humans came from nature; they depend on the environment. The health of the earth ultimately determines the ability of the economy to function. When one goes to turn on water or lights, those things are available because nature is providing them. Society as a whole needs to take on the responsibility of tracing

back where all of the things in their lives come from so it can ensure that the vitality of these resources is guaranteed. The economy and society can function sustainably—in fact, they can thrive. By implementing progressive ideas that promote quality, reuse of materials, and minimum individual consumption, the functioning of systems can persist indefinitely.

Alyson Crutchfield is an undergraduate student at Loyola University Chicago. She is majoring in International Studies with a focus on Global Sustainability. She recognizes that sustainability is not just about preserving the intrinsic value of nature but is also a human rights issue. For this reason, she wants to devote her life to fight for the health of the environment and humanity.

NOTES

1. "Economics Professor: We're No Closer to Happiness than We Were in the 1950s." Business Insider, April 11, 2015, at <http://www.businessinsider.com/economics-professor-were-no-closer-to-happiness-2015-4>. Excerpted conversation with Lord Richard Layard from *Caring Economics: Conversations on Altruism and Compassion*, Between Scientists, Economists, and the Dalai Lama, ed. T. Singer and M. Ricard (London: Picador, 2015).

Healing the Divide: Breaking the Boundaries between Humans and Nature

By SARAH ASHCRAFT-JOHNSON, ALEXANDRA
MATTINGLY, AND ALEXANDER PAPAIOANNOU

What happens when we perceive ourselves either as separate from or as a part of nature? Where our society stands, we already consider ourselves as separate from nature. For the vast majority of history, humans have acted as conquerors of nature, clearing the land for whatever reason they chose. Even now, we clear cut forests for timber, destroying old growth ecosystems for fleeting human habitation. Modern mining practices include mountaintop-removal mining, which literally obliterates a mountain into a valley of rubble. The earth has spent 4.6 billion years developing these unique ecosystems; we do not have the right to destroy them.

We consider ourselves as morally superior to animals with little responsibility for their welfare. The early hunting culture in America consisted of killing as many individuals as possible. There are dozens of old photos depicting hunters and fishers with their take of thousands of animals. Images of hunters standing in front of a mountain of bison skulls, gleefully showing their kills. Grey wolves in North America, a keystone species, have been hunted nearly to extinction through government-sanctioned wolf eradication programs. A few fishermen showing off their catch of thousands, way more than could be consumed. These images are horrifying to our eyes today because we are realizing these actions were wrong. This type of hunting has directly led to the extinction of many species. However, we are slowly finding our place within nature. The Anti-Cruelty Society and other animal rights groups

show that society's morals surrounding animals and nature can change and are changing.

Our moral separation from nature has led to the mismanagement of natural resources. We hunt, mine, and log without studying the impacts of extraction methods nor the results of reduced animal populations. The worldwide fishing industry is a perfect example; our world's oceans have been overfished for generations. Many popular fish species have been fished to endangerment or extinction. Over the course of the twentieth century, we have devoured our way down the list of popular fish, marketing less desirable fish when more delicious fish populations have been depleted. Catch limits must be enacted to help current target fish species return to sustainable populations. While some threatened or endangered fish species may rebound, other decimated populations may never recover.

When we consider ourselves a part of nature, human society can intertwine with nature rather than conquer it. Our place in the world is alongside nature while using it in a way that works with nature. We can learn from the natural world and model our societies after environmental systems. We could create a human ecosystem that cycles products and energy rather than directional flow to the trash heap.

Products come and go in our society, eventually becoming trash. This trash is merely transported away from us so we don't have to deal with it anymore. However, we can change this trash line into a recycling circle by studying how nature deals with "waste."

A natural ecosystem is an intricate web of cycles and relationships between organisms and their environment. When ecosystems are healthy, energy and nutrients flow through the system without being lost. At every point in the food web, the waste from one organism is used by another. When plants and animals die, decomposing organisms eat the remains, breaking down the molecules through digestion. These small, organic molecules allow plants to flourish. Everything that one organism deems “trash” becomes resources for other organisms; nothing is waste. The prey that the predator doesn’t eat is consumed by other animals and insects. The food that we don’t eat goes to the dump where it decomposes but is locked away from the rest of the environment, remaining useless for future growth. To truly be part of nature, human society must operate in a way that also cycles energy without releasing destructive pollutants into our surrounding nature.

Our society has much to gain if we truly learn from nature and emulate its systems. To do this, we have to work with nature’s processes rather than against them. When we combine nature’s lessons and human technology, we can develop better methods for old practices. Crops can be grown in mixed fields that produce a variety of crops while increasing biodiversity of farmland. Resources such as animals, fish, wood, and minerals can be harvested in a way that minimally impacts the ecosystem. Greenhouses and buildings can use natural airflow and sunlight to heat, cool, and illuminate themselves. Electricity can be generated by renewable sources such as wind, solar, and geothermal. Organic waste can be composted into fertilizer for agricultural systems. Organic waste can also be composted using anaerobic digestion to capture methane for fuel. Neighborhoods could use green roofs and community gardens to grow most of their own food. When we connect our society with nature, both human and ecological cycles can flourish.

When we view ourselves as completely separate from nature, we build barriers and create divisions seen nowhere in the natural realm. We divide ourselves from nature, isolated from the elements. Since the beginning of humanity, we have always split social groups into “us” and “them.” This is the default mindset when we look at nature as well; we view ourselves as “us” and all of nature as “them.” We believe we are different from the other inhabitants of earth. We enjoy human-made comforts like homes and buildings. Streets and buildings are hard delineations; these

physical barriers further separate humanity from nature and create boundaries that would not otherwise exist. This separation has been useful to humans: if we are not one with nature, we can be the masters of nature and use all of its resources for our pleasure. But, when we do this, our humanity changes; the way we view animals and plants changes. When we think in terms of strict separations, the world becomes a very precise and technical thing, instead of the complex intertwined system it really is.

When we view ourselves as a part of nature, we see the similarities between humans and nature. We are human beings; we are made of flesh and bone, of carbon and other elements, just like every other living thing on the planet. Biologically, we are no different from nature. All of the separation we experience, we have created. If we embrace our natural roots and an ecologically friendly outlook, we see that we can live and thrive in nature as other animals have. We would realize every one of our actions has a consequence and therefore act responsibly and respectfully toward nature. Viewing ourselves as a part of nature would mean knocking down the artificial boundaries we have imposed on ourselves and nature, allowing species to interact like they would have without human interference. It would help restore ecosystems and allow for a more circular system.

Being part of nature means working toward a healthy, diverse world ecosystem. Viewing ourselves as separate from nature has proved disastrous for both humans and nature. The way we have depleted the planet’s resources and imposed unfair environmental conditions on the poorest of our people is unsustainable and unhealthy. While we may never view ourselves as completely separate or completely a part of nature, it is important to consider how we interact with and within nature. We must ponder how we can promote balance and health for all of earth’s creatures.

Sarah Ashcraft-Johnson is a recent graduate of the Institute for Environmental Sustainability at Loyola University Chicago. Her research experiences include mycorrhizal relationships on green roofs and prairie, wetland, and woodland habitat assessments. She is working to expand her expertise into desert, alpine, or marine coastal habitats.

Alexandra Mattingly is from Milford, Michigan and in her last semester at Loyola University Chicago, majoring in Environmental Science and minoring in Studio Art. She hopes to continue her studies and plans on pursuing a PhD in Wildlife Ecology or a similar field.

Alexander John Papaioannou is an Environmental Science student with hopes of conducting research in the future. He is also an avid programmer, specializing in languages such as R and Python. He currently resides in Chicago.

Introduction to Essays from the Greening Youth Internship Program

By JAMES EDWARD MILLS

As a youth just out of college I doubt that I would have had the poise or presence of mind to speak thoughtfully to a cabinet member of a sitting president. The students who met with U.S. Secretary of the Interior Sally Jewell in August of 2016 carried themselves with a level of confidence and conviction that I could not help but admire. Gathered in Washington DC to share their experiences after summer internships at various National Park units across the country, these young people affirmed for me my profound belief in the power of storytelling and the vital importance of personal narrative.

The students recounted to Secretary Jewell their thoughts and impressions of the time they spent in service to National Park sites that included, among others, the Statue of Liberty, the Grand Canyon, Yellowstone, and historic sites in and around the U.S. capital. Members of the Historically Black Colleges and Universities Internship program created by the Greening Youth Foundation, each student expressed her sincere appreciation for the opportunity to be directly involved and engaged in the preservation of these monuments to our collective past. And as young people of color they made it clear that there are many opportunities to interpret the stories of our national heritage in ways that are more relevant and accessible to those whom history so often neglects.

Having spent much of the last few years telling

stories of historical figures who have helped to shape the modern National Park System, I am excited to see students seeking out and even creating stories of their own. In partnership with the Center for Humans and Nature, I was pleased to work with these interns to develop their thoughts as essays to share in this journal. Of the five submitted entries we chose two to highlight in this *Minding Nature* issue. As students of history and environmental conservation, Natalie Rodriguez and Akua Amponsah exemplify the importance of curiosity, critical thinking, and courage in the pursuit of truth.

James Edward Mills is a freelance journalist and an independent media producer. In a career that spans more than 20 years he specializes in telling stories about outdoor recreation, environmental conservation, acts of charitable giving and practices of sustainable living.

Breaking Down Walls

By AKUA AMPONSAH

Working with the Greening Youth Foundation and the National Park Service was a transformative journey. The Historically Black Colleges and Universities Initiative internship program allowed me to travel to new places and be exposed to different modes of thinking. I had the chance to use the skills I acquired through this experience to fuel my aspirations to encourage change in communities no matter what my career path may be. Additionally, the Next 100 Coalition revived this spark within me to help grow and to elevate those around me.

The Next 100 Coalition is a collective of individuals from diverse backgrounds who have come together to promote diversity in public land management through education and workplace empowerment. Our internship concluded in a meeting with Sally Jewell, the U.S. Secretary of the Interior in Washington, DC. That encounter made me reflect on how important it is to build lasting bonds in this life and to help support others to achieve a shared goal. When we met in DC there was not only unity among members of the coalition and my fellow interns, but there was also a sense of cooperation and empathy among the Department of Interior staff. Secretary Jewell had a personal connection to some of those attending, but she also had a personal connection to the cause of environmental protection. I did not feel as if it was an “us vs. them” dynamic. We sat randomly placed at the same table to prevent the predominantly white staffers sitting on one side and the ethnic minorities on the other.

After a few moments, I did not feel a sense of awkwardness or tension. Hearing others speak before me made it easier to share my ideas and my grievances. But I was able to discuss those things that I believe are working well at the National Park Service to improve diversity. The experience broke down communicative and emotional walls, so to speak, to allow for each side to voice its opinions.

It was very uplifting to be in such a supportive environment. Seeing people of color working in these fields and making changes helped me to identify my own aspirations. Being there, listening, and talking with the group, made things feel real in a sense. I could see myself in a few years, or even now to a smaller scale, fostering change in my own community.

The meeting was meant to highlight the huge elephant in the room, the Department of Interior’s lack of diversity. One of the causes of this problem is a complicated system of hiring for positions in federal employment. As it stands, white males hold supervisory positions, while people of color dominate the maintenance sector. This discrepancy of hierarchy is often discouraging for young Black, Asian, and Latino students who plan to pursue those supervisory positions but have few role models or mentors to encourage their success. As a person of color soon to graduate from college I found the statistics rather alarming. And after noticing the demographics, I saw that it was true.

Another idea we discussed is the influence of culture on one’s career pursuits. There is often the mis-

conception that people of color do not like nature, so they wouldn't enjoy a career working in an outdoor-related field as a park ranger, for example, or a wildlife biologist. I argue that it has more to do with exposure. Many young people may not have grown up near parks or had access to schools and programs that encourage them to explore the fields of science or outdoor recreation. Many are denied the potential to pursue a career in forestry or historic preservation or even to become knowledgeable about the environment and its natural processes because they simply don't know much about these topics. The time, emotional investment, and connection to conserving the land simply isn't there.

To me, conservation is the balance between preserving resources and the environment, but is also about setting recreation areas aside for human enjoyment. I was told once that we often see the human world and nature in binary, mutually exclusive terms. But human beings are part of nature. We are just as much influenced by our surroundings as we directly impact the world in which we live. Viewing nature in terms that are personally inclusive and relevant to our everyday lives is the only way to be empathetic to the cause of environmental protection. Thus, the greatest issue that plagues wildlife and land conservation is apathy. To care about an issue, one needs to have some level of understanding of that issue. Additionally, how one views oneself in relation to the environment is also a factor. If a society views humans as the masters of their environment or as foreign actors whose behavior is unrelated to natural systems, it is unlikely that it will focus much of its energy on it. If this is the overarching reality, economic gain and personal interest will almost always supersede environmental preservation.

My experience with the Greening Youth Foundation has been a positive and transformative one. From the summer after my high school graduation through my final semester in college I have learned a lot about the relationship between humans and nature. My work as an intern this past summer with the National Park Service at the Kenilworth Park and Aquatic Gardens in Washington, DC has inspired my academic decisions, aspirations, and future career plans. I feel that I have developed new passions and have become more independent. From observing my co-workers, I have learned that my career path is not fixed. I started off with medicine, then wildlife biology, and now I'm interested in environmental policy. And having worked with the Next 100 Coalition, I believe that I can have a seat at the table. Knowing that I now have the skills

and a support system of mentors to help me achieve my goals, I feel liberated and ready to run with it.

Akua Amponsah is a rising junior at the University of Maryland, Baltimore County. Double majoring in Biology and Global Studies, she has an interest in urban agriculture and eradicating food deserts in inner-city communities. In the past she has done research on frogs in southern Florida and data collection with sea turtles. As a biology technician, she hopes to use the research skills and tools she has acquired in her academic career.

Speaking Truth to the Secretary of the Interior

By NATALIE LOUISA RODRIGUEZ

During the summer of 2016 my experience with the Greening Youth Foundation was both profound and enlightening. In my second year in their Historically Black Colleges and Universities Internship (HBCUI) program, I became more confident in my abilities to truly grow as an individual. Having just graduated from North Carolina Central University, it was my sincere belief that this opportunity would enhance my professional expertise and further prepare me for my next chapter at North Carolina State University's graduate school.

Even though I felt overwhelmed by the challenges presented in this program, I knew that this particular program was the best choice for me. From themes of historic preservation to education, HBCUI offered numerous positions that catered to my interests. It was hard leaving my home and family for so long, almost two months, but through the supportive relationships I had created with National Park Service staff members, who had become like an extended family, I knew that I would be able to achieve my academic goals. I'm so fortunate.

As a history major, I had the opportunity to practice skills I had learned at North Carolina Central University. Having the chance to work at National Capital Parks–East's Mary McLeod Bethune Council House National Historic Site, the first official headquarters for the National Council of Negro Women (NCNW), I learned much about the preservation of our cultural heritage through interpretation. My supervisors, Margaret Miles and John Fowler, were

dedicated to educating me in the park's history and shared with me their enthusiasm and pride in the enduring legacy of Mrs. Bethune, the founder of the NCNW. I had to be able to passionately express and convey her extraordinary story, as well as that of the NCNW, to a very diverse audience. Interpretation is a key factor in the park's success. It was my responsibility to provide each visitor with a compelling experience that would allow them to fully understand the significance of this great woman who did so much to secure the civil rights of African Americans. It's very unfortunate that a lot of people had never heard of Mrs. Bethune, but they always thanked me for sharing her veiled story.

Throughout my experience I worked on different projects and coordinated various events. With each initiative, I focused on archival and historical research. I did intensive research on Mrs. Bethune and the NCNW. Through this research, we drew very interesting connections to a new park, the home of Carter G. Woodson, an African American historian, author, journalist, and the founder of the Association for the Study of African American Life and History.

In addition, a fellow intern, Rochelle Ward, and I were instrumental in organizing two big events held at the park. First was a book signing of Diane Kiesel's book, *She Can Bring Us Home*. This book was important to the park because it narrated the story of the second president of the NCNW, Dorothy Boulding Ferebee. I personally had the privilege of assisting in event planning and creating the posters for the event.

The current NCNW president also attended and gave opening remarks. (It was such a relief that the NCNW president, Ms. Ferebee's descendants, and other visitors were pleased with the book signing.) We also had the opportunity to coordinate Mrs. Bethune's 141st birthday celebration; I was the official photographer, documenting the festivities, and we led the efforts to plan interpretive events for the children and adults who attended.

Finally, I was in charge of creating biographies of key leaders whom Mrs. Bethune worked closely with in her lifetime. These biographies were heavily researched and edited so that they could provide valuable information to the public. They will be presented on the Mary McLeod Bethune's official NPS website when finalized: <https://www.nationalparks.org/explore-parks/mary-mcleod-bethune-council-house-national-historic-site>.

Everyone at Mary McLeod Bethune Council House was so welcoming. They made it their goal to teach me their many responsibilities. HBCUI gave me the great opportunity to explore and learn about this historic site and share my enthusiasm with others.

Through HBCUI I was also selected to participate in a meeting between Secretary of the Interior Sally Jewel, and the Next 100 Coalition, a group committed to diversity and inclusion in the management of public land. This meeting gave me the opportunity to meet with key government officials and major community leaders. I valued this chance to express my gratitude for working with the National Park Service.

This was also a safe place for me to talk about the need for diversity in the federal agency that is in charge of historic preservation. I expressed my concerns about being a woman of color in an underappreciated African American Historic Site. During my internship, I learned about the remarkable history of a woman and her organization. Unfortunately, it seemed that the facility dedicated to Mrs. Bethune was being ignored, not just by the rapidly gentrified neighborhood that surrounds it, but by National Capital Parks–East. Though I observed a deep sense of commitment in the park rangers who worked at the site to push for the park's success, it seemed their efforts were either met with resistance or disregarded. So, in our meeting, despite my nervousness, I very bluntly asked the Secretary, "How can I work for the National Park Service when I feel as though my people's history is undervalued? How can NPS promote diversity when

it hinders itself from celebrating its own?"

Yes, this was hard to say, but I said it anyway because it needed to be said. Though taken aback by my words, I believe the Secretary heard what I had to say. The issues we face today are never going to be easy to express, but I appreciate that I had a space to say it. I appreciate the fact that I was surrounded by a group of individuals who were willing to listen and to add to the conversation.

This internship showed me why I fell in love with history and why it is so important to preserve our national historic sites and monuments. The Greening Youth Foundation gave me the chance to again work in my chosen profession. I will forever be grateful for the opportunity, and I can only move forward after this. I know for a fact that my future will entail a career in historic preservation and education.

Natalie Louisa Rodriguez was raised in Durham, North Carolina. She graduated in May 2016 with a bachelor's degree in History from North Carolina Central University where she was inducted into three honor societies: Tau Sigma National Honor Society, National Society of Leadership and Success, and Phi Alpha Theta National History Honor Society. Natalie enjoys photography, reading, writing, and traveling, and she is currently working toward an MA degree in Public History at North Carolina State University.

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LANGUAGE MAKING NATURE

By David Lukas

Great Britain, whose children we are, and whose language we speak, should no longer be our standard; for the taste of her writers is already corrupted, and her language on the decline.

—Noah Webster, 1789

The new circumstances under which we are placed, call for new words, new phrases, and the transfer of old words to new objects.

—Thomas Jefferson, August 16, 1813

Judicious neology can alone give strength and copiousness to language, and enable it to be the vehicle of new ideas.

—Thomas Jefferson, January 27, 1821

My book, *Language Minding Nature*, is an odd thing; it is a naturalist's walk through the language-making landscape of the English language, and following in the naturalist's tradition it combines observation, experimentation, speculation, and documentation—activities we don't normally associate with the words we use.

As a young budding naturalist I remember not only observing the world, but being in the world: moving pieces around, altering the flow of things, and testing how the world responded to me. I've approached language in the same way, not as an academic but as a curious child who is still building little mud dams in creeks and chasing after frogs.

So my book is about testing, experimenting, and playing with language. It is a handbook of tools and techniques for taking words apart and putting them back together again in ways that are meaningful and legitimate (and sometimes illegitimate). It is about

peeling back layers in search of the language-making energy of the human spirit. It is about gaps in meaning that we need to start noticing and naming—the places where our dreams and ideals are no longer being fulfilled by our fast-paced, hyper-commercialized lives.

Language is a playful, ever-shifting creation but we have been taught, and most of us continue to believe, that language must obediently follow precisely prescribed rules that govern clear sentence structures, specific word orders, correct spellings, and proper pronunciations. If you make a mistake or step out of bounds there are countless, self-appointed language experts who will promptly push you back into safe terrain and scold you for your errors. And in case you need reminding, there are hundreds of dictionaries and grammar books to ensure that you remember the “right” way to use the English language.

With this backdrop and training in mind it might come as a bit of a shock to discover that this “ideology of language,” with its preening emphasis on “correctness, authority, prestige, and legitimacy,” represents only one small blip in the long and rich history of the English language. And, for better or worse, we live in a moment in history when a tightly controlled language, economy, and political system work together to create a culture of lies that best serves a powerful elite, allowing them to continue funneling power and money (i.e., influence) to themselves at great cost to human communities and natural ecosystems.

In its heart and soul, language can also be a revolutionary force and it can be used to call forth lies, but you cannot have a revolution if you use the language of the conquerors. So one goal of this book is to awaken language and explore the capacity that all of us possess to be alive in our language. Being awake and being alive is in itself a revolutionary act—and this is something that Noah Webster, Thomas Jefferson, and many other important early American thinkers were keenly aware of.

In our busy modern lives we have largely forgotten

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that language is meant to be inventive and playful, that hidden beneath the veneer of modernity the English language is potent with ancient magic-making power. Throughout this book I will refer repeatedly to “play,” but I’m not speaking about play as something trivial, I’m speaking of play as something profoundly creative and freeing. And underneath everything, this playful exploration of language is about dissent, about rising up and crying out in support of that which is alive and vital. It is about imagination, about truth-telling and contemplation; it is an undertaking that is fierce, creative, and honest.

My own journey toward language was sparked in 1996 when I read Keith Basso’s astonishing book *Wisdom Sits in Places*. Writing about the unique place-making language of the Western Apache, Basso described language in a way that I’d never considered before, as roots and fragments strung together to sing of the land. This idea intrigued me so much that I began carrying Donald Borrer’s classic booklet, the *Dictionary of Word Roots and Combining Forms*, with me on all my hikes (a practice which I’ve continued on a daily basis for twenty years and on thousands of miles of trails) in order to learn the meaning and origin of word elements at the moment they occurred to me while walking in wild landscapes.

For many years this seemed little more than a quirky hobby, with no real intent or direction, but then a friend introduced me to Calvert Watkins’s magisterial survey of Indo-European poetics, *How to Kill a Dragon*. In a flash I suddenly realized that there might be untapped ways for the English language to speak of the magic of the land and the depths of the human spirit, and I began a four-year quest to read every book I could find on the history, formation, and word-making processes of the English language.

I explored some of the many pieces and processes that have gone into shaping the English language as we use it today, and as I researched this material I

carried these ideas with me on long hikes in wild places and held them up against the natural world to see which ideas resonated and which ideas took on a life of their own. My writing emerged from, and reflects, these hikes; and because I also lead walks as a naturalist in my professional life this book is modeled on the metaphysic that I know best—the flow of ideas and observations that arise spontaneously when humans encounter the natural world with curiosity and wonder. It feels artificial to offer a table of contents or an index for a journey like this, so I trust and hope that you will discover something new and unexpected each time you step into this book (just as you would on a nature walk).

My book is full of what many people will find to be strange and complex ideas, so wherever possible I have tried to offer examples of each creative process at work. Some of my examples are downright silly, even to me, and I apologize for that. But it’s the spirit of any creative process to get the ball rolling by brainstorming and throwing out ideas without worrying about judgment, and I felt that that playful openness and willingness to take chances was more important than self-consciously editing my own examples (as if I knew what the ideal models should look like).

Language experts and linguists might take exception to a few of my descriptions and conclusions, and some of their complaints may be valid, but keep in mind that this book is not about technically perfect processes or perfectly-formed words, this book is about the wild, creative energy that generates language. Ultimately, this language-making energy is democratic and freely available to all of us no matter what the experts tell you.

At multiple points I invite you to experiment with language and not worry about making mistakes because “culture” will always come along to prune your contributions. What I mean by this is that if you make up intriguing new words, and if you use them in the telling of a meaningful story, then your culture might

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adopt your words and mold them into shapes that will endure over time even if your initial contributions were awkwardly formed or silly looking at first.

If this doesn't make sense, consider a word like *ravisse*, which Chaucer invented in 1374 in the sense "to seize" (from the old French word *ravir*). Chaucer's word almost certainly looked ridiculous and out of place when he first introduced it, but in its subsequently pruned form, *ravish*, it has endured for over six hundred years—and that's exactly what might happen to your words so you can trust this process.

My hope is that my book helps you, or inspires you, to create new words that are sensuous and meaningful in their contours, words that work to express your own deeply felt experiences in the world. The challenge—your challenge—is to open up language and experiment fearlessly because other people will come along after you to close language back up again.

This concept of opening up language will be unfamiliar to most people so it might help to realize that the cycle of opening and closing lies at the very heart of this dynamic, flexible language we call English. Over and over again revolutions and seismic shifts have come along to break down rigid conventions and open up language, then prescriptivists have stepped in with rules that re-establish order and close things back up again. Think of Chaucer, who is said to have added 1,100 new words to the English language while "inventing" English poetry; think of Shakespeare and his astoundingly influential body of work; or think of Lewis and Clark, who added over 1,000 words to the English language while attempting to describe a continent that no European had written about before.

Each of these writers, and many others beside them, came along at a moment when nothing was cut and dry, when nothing was worn out. These are the moments when language shines, when it has the freedom to express new values and new ideals; then things close up again, and anyone who steps out of line will be corrected and edited—both literally and figuratively.

I look around at my culture, at the ways that people treat each other and at the ways that people treat the land, and feel that we live in one of those moments when language is closed and guarded by gatekeepers. I read Thoreau's *Walden* and see that the language we use to speak of the natural world, and of our relationship to the natural world, has changed very little in 150 years (if not declined). And if the language we use to speak of the natural world is not innovative and engaging is it any wonder that few young people get excited about nature?

I feel that the time has come for language to shine again, to bloom like a flower and lead the way by speaking confidently of the future we want. But this will only happen when we create new words that can serve as vessels for new ideas and new dreams. Long-stable systems and stale old conventions are already breaking down before our eyes, and in the midst of this teetering balance we have an opportunity to rebuild our culture and our relationship with the natural world through language.

It's clear that experimenting with and reshaping an entire language would lead to chaos, and that's not the intent of this book, but it would be okay if experimentation was limited to one field of language. I propose that our language of nature is the perfect place for us to experiment and create new words. It's the one domain where language should be wild and trailless and prickly anyway, so why can't it lead the way?

But isn't it a mistake to make words harder to understand and use? Don't we want to make it easier to read about the natural world so that people feel welcome, rather than making the path more complicated? Paradoxically, psychologists have discovered that people are much better learners when words are hard to understand because it creates what psychologists called *desirable difficulties*. In fact, our brains are wired to grapple with difficulties, and it turns out that we almost instantly forget or dismiss things that are easily understood. Studies have found, for instance,

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that students remember more and have better learning comprehension when they are given materials that are written in ugly or difficult-to-read lettering because these “desirable difficulties” lead to *productive frustration*. Frustration sounds like a bad thing, but it slows us down, increases our engagement, awakens our curiosity, and creates mysteries that our brains love to solve. Doesn’t it make sense then that strange, oddly formed, or broken words—all described in this book—would have the same effect?

From my study of the long trajectory of the English language I believe that it is absolutely vital that we keep shapeshifting our words. Once locked in place, everything contained within the vessel of a word (its spelling, meaning, connotation, sound, etc.) becomes mundane and familiar. A word soon loses its magic-making power, as well as its connection to something vibrant and alive “out there” in the world—and this process can only diminish our deep bond with the natural world as it speaks to us through words. It is essential for our survival that we continue to create innovative new words that require and reward our attention, and that we engage in this process so we stay awake and alive.

Purists will argue that new words need to follow well-established rules. And yes, it’s true that you can study and familiarize yourself with these rules; but in all human endeavors there are people who follow rules and those who ignore or break them. So it’s up to you which path you want to take, and neither choice is right or wrong. Someone who doesn’t follow rules may not be technically perfect in their work, but is more likely to make unexpected contributions or leaps of the imagination; while someone who follows rules contributes rigor and consistency, and has a better chance of being accepted.

Either way, the intent of this language-making task should always be towards the refinement of language for the sake of an entire community, rather than on an individual showing off and confusing readers with odd

or overly-elaborated words. Strive for simplicity, clarity, and beauty in the sound and shape of each word you create, and remember that little of this book will be meaningful unless these language-making processes and new words are used in the telling of great stories. This is the task of our time.

David Lukas is the author of six books. He has written a weekly column in the Los Angeles Times and a monthly column in Sunset magazine, and he has taught at the Squaw Valley Community of Writers for over twenty years. This article is excerpted from the first chapter of *Language Making Nature*, which was published by Lukas Guides in 2015 available at: <http://www.languagemakingnature.com/>.

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PROVIDING AN INTEGRATED STORY

By Mary Evelyn Tucker

We are at a new moment in our planetary history, one fraught with uncertainty and violence, as well as rapid change and unforeseen compassion. As we see our present interconnected global challenges of widespread environmental degradation, climate change, crippling poverty, social inequities, and unrestrained militarism, we know that the obstacles to the flourishing of life's ecosystems and to genuine sustainable development are considerable.

In the midst of these formidable challenges we are being called to the next stage of evolutionary history. This requires a change of consciousness and values—an expansion of our worldviews and ethics. For the evolutionary life impulse moves us forward from viewing ourselves as isolated individuals and competing nation-states to realizing our collective presence as a species with a common origin story and shared destiny.

The human community has the capacity now to realize its intrinsic unity in the midst of enormous diversity. And, most especially, it has the opportunity to see this unity as arising from the dynamics of the evolutionary process itself. We have for the first time a scientific story of the evolution of the universe and earth that shows us our profound connectedness to this process. We are still discovering the larger meaning of the story. There are many movements in this direction, including *Journey of the Universe* and Big History.

The Journey of the Universe project consists of an Emmy award-winning film, a book from Yale University Press, a series of twenty conversations with scientists and environmentalists, and a website.

Drawing on the latest scientific knowledge, *Journey* tells the story of cosmic and earth unfolding in a way that makes it both relevant and moving. What emerges is an intensely poetic story, which evokes awe and excitement, fear and joy, belonging and responsibility.

The story of the universe is clearly a dramatic one. Throughout billions of years of evolution, coherence and disintegration have been only a hair's breadth apart. Chaos and creativity are pervasive. The ability of matter to organize and re-organize itself is remarkable—from the formation of the first atoms to the emergence of life. We are coming to realize that the energy released at the very beginning has finally become capable, in the human, of reflecting on and exploring its own journey of change. Simple hydrogen has become a vibrant, living planet, with beings that now are able to investigate how this has happened and imagine a life-sustaining future.

We are indeed the “mind and heart of the universe,” as Chinese Confucian philosophy would say. As such we humans are endowed with reflexive and emotional capacities for finding our role as co-creators in this unfolding evolutionary process. For the Confucians we can be transformative agents of positive change in the social, political, and educational orders. Thus, our creativity can align with the creative process of the universe.

Waking up to our fundamental relationship with the cosmos is a means of re-engagement with life and assisting its future flourishing. *The Journey of the Universe* enables us to connect more deeply with the universe and the earth of which we are a part. In doing this, we may appreciate the need for a sustainable human presence on the planet. We need to engage in mutually enhancing relations with earth's ecosystems. Therefore, we need a broader understanding of how systems work—both human and natural.

Thus, the integrated story of the origin and development of the universe, of earth, and of humans can

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become an inspiring vision for our time. This is because this story gives us a sense of our common evolutionary heritage and shared genetic lineage. This new understanding of the kinship of humans with each other and with all life can establish the foundation for rediscovering our past and sustaining the future.

We can be inspired by this scientific view of nested interrelatedness—from galaxies and stars to planets and ecosystems—so that we sense how personally we are woven into the fabric of life. We are part of this ongoing journey and interdependent with life's ecosystems. This is what *Journey of the Universe* film and book offer to contemporary humans.

From this perspective we can see that our current destructive habits toward the environment are unsustainable. In an evolutionary framework the damage we are causing is immense—indeed, cataclysmic. We can thus recognize ecological, economic, and social change as not only necessary but inevitable. This is what *Journey of the Universe* Conversations provide in interviews with environmentalists and change agents.

This *Journey* perspective, then, requires expanding our frame of reference and broadening our worldview. It invites us into a journey of deep time—a great story for the great work still ahead of us. Earlier cultures have had epic stories to guide them in creating sustainable societies. This is the hope of *Journey of the Universe*—an invitation into awe and beauty that will provide energy for the transformation toward a flourishing earth community, now and into the future.

Mary Evelyn Tucker is a Senior Lecturer and Research Scholar at Yale University, where she holds appointments in the Divinity School and in the School of Forestry and Environmental Studies. She is co-director with John Grim of the Forum on Religion and Ecology at Yale. In 2011 she completed the *Journey of the Universe* with Brian Swimme. To learn more about *Journey of the Universe* please visit www.journey-oftheuniverse.org.

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“Journey of the Universe: A Story for Our Times” Yale University Online Classes Now Open to the Public



Mary Evelyn Tucker and John Grim, Senior Lecturers and Research Scholars at Yale School of Forestry and Environmental Studies are currently offering four six-week online courses. These are featured as a specialization under the theme of "Journey of the Universe: A Story for our Times." This specialization includes two courses on *Journey of the Universe* and a course on the *Worldview of Thomas Berry*. Each of these courses can be taken independently, followed by an *Integrating Capstone* course. These are MOOCs (Massive Open Online Courses) available on Coursera to anyone, anywhere on the planet. This is the first MOOC specialization for Yale and the first MOOCs for the Yale School of Forestry and Environmental Studies.

Learners may audit these courses free of charge (with the exception of the capstone course). Or learners may register for all of the courses for a small fee and, upon completion, receive a specialization certificate. The courses do not have to be completed within the six week period, rather, learners may finish at their own pace.

Courses:

Journey of the Universe: The Unfolding of Life

Journey Conversations: Weaving Knowledge and Action

The Worldview of Thomas Berry: The Flourishing of the Earth Community

Integrating Capstone: Living Cosmology (only available as part of the specialization certificate—not available to audit)

Upcoming sessions:

January 16, 2017 - March 6, 2017

February 13, 2017 - April 3, 2017

March 13, 2017 – May 1,

April 10, 2017 – May 29, 2017

May 8, 2017 –June 26, 2017

June 5, 2017 – July 24, 2017

For more details and to register, go to:

<https://www.coursera.org/specializations/journey-of-the-universe>

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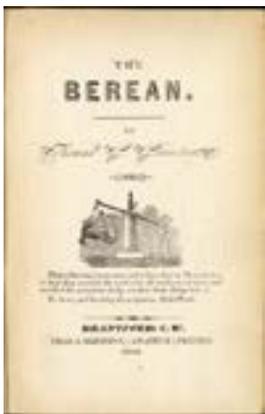
MATTERS OF PRINT

By Joyce H. Munro

Music to read by: “The Ground” by Tord Gustavsen

But for the present American war, this little volume, long ere this, would have issued from the American Baptist Publication Society of Philadelphia...but since the commencement of hostilities, that very useful society has published no new works.

—Thomas S. Shenston, *The Berean*, 1862



Title Page, *The Berean*

And thus, T.S. Shenston was forced to self-publish his book in Brantford, Canada, a town without a publication society. Right up front, Shenston admitted he was an amateur printer, and he proved it by breaking every rule of typography. The result is a visual nightmare—hodgepodge of typeface, vertical and circular text, bolded phrases, frantic use of italics and exclamation points—it yells so loud your ears hurt. On the final page, Shenston apologizes for the book’s appearance and its many typographical imperfections. Apology accepted.

After all, *The Berean* wasn’t intended to be refined and handsome. Rather, Shenston set out to publish a straightforward argument for common folk who, like the Bereans in the Bible, were ready and willing to believe the truth. Well, Shenston certainly hoped folks would believe the truth: that our Lord’s final commission—Baptism—was to be administered by immersion of the whole body. One must be overwhelmed by water, not merely splashed in the face with gentle droplets! This was a defense of baptism done Baptist style, giving EVERYTHING God has said on the subject. Not at all ecumenical and “not too Doctor-of-Divinity-ish and Master-of-Art-ish.” Shenston then proceeded to quote a couple dozen Doctors and Masters, like Robert Alexander Fyfe, Samuel Clark, and W.J. Conybeare.

Christened at birth in England and immersed as an adult at Brantford Baptist Chapel, Shenston was dead set against “Infant-Sprinklers.” He made that clear with copious proof-texting and the oft-repeated exhortation that only those old enough to believe in Jesus should be baptized. It took him months to set up type on his one-person flatbed printing press, ink the rollers, and crank out all the pages. Eventually he stockpiled enough copies to sell at local shops and to give away to Theological students at the Canadian Literary Institute, where Fyfe was principal.

Thomas Strahan Shenston, registrar and magistrate of the newly-formed county of Brant, Ontario. Compiler of county statistics and useful information. T.S. had known his fair share of business failures by the time he wrote his treatise on baptism. Early on, his saddler’s shop and home had been destroyed by fire. Neither was insured. Fortunately, his family was spared—his daughter just three, his son a baby. But Shenston was not one to let failure define him; through cunning and sheer energy, he mastered several trades—including the fire insurance business—and brought his influence to bear on a number of Baptist and civic organizations. In his spare time, he authored religious tracts on topics dear to a Baptist’s heart, an-

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notated by an avalanche of scripture passages. “Ever busy with his pen”—that’s how the editors of the *Canadian Biographical Dictionary and Portrait Gallery of Eminent and Self-Made Men* described Shenston. And zealous.



Thomas Strachan Shenston, circa 1869

The same could be said of his daughter, Naomi Ann Shenston. She, too, was busy with the pen, zealous to defend an acquaintance, Mary Ann Bailey, whose fiancé had jilted her. The jilter was Eben Rice, a theological student at Fyfe’s Institute. Naomi knew Eben well enough to place herself in the middle of his broken engagement—he was a classmate of her brother Reuben, and when he came to Brantford, he sometimes stopped at the house for tea. All three attended the Baptist chapel and occasionally wrote newsy letters to each other. Once, Naomi had written confidentially to Eben, asking him to talk with Reuben about his soul’s welfare. She had faith in Eben’s ability to nudge Reuben toward Jesus.

But Naomi’s faith in Eben had lessened considerably. How many drafts she wrote, we can only guess, but just like her father, Naomi crafted a heavy-hitting argument and laid on the guilt:

Esteemed Friend, Providence seems to have directed my step hither at this time. I little thought that such a duty as the present awaited me. I came down on Thursday last, and much to my surprise found Miss Bailey here.

Your letter was received by her yesterday and I need scarcely say it has completely prostrated her...The blow, though I think not altogether unexpected, has proven too great for her . . . it has completely shattered her nervous system. I do most sincerely regret that you have deemed it your duty to take such a step...I trust that you have not rashly and unthinkingly blighted and blasted the hopes and happiness of one of earth’s lonely ones.

Perhaps Naomi, too, was one of earth’s lonely ones, though on her surface she may not have seemed so. She was baptized when she was twelve and grew up in Sunday school. And throughout that entire time, her father was superintendent of the school, treasurer of the church, a deacon, and financial backer of the church’s mission project. Twice the Brantford chapel burned down, and twice her father helped rebuild it. Naomi and her father took their religion literally, read their Bibles, believed in Jesus, and put their money where their mouths were. But they did not see eye to eye when it came to matters of the heart.

Two months after admonishing Eben for taking a rash step, Naomi took an equally rash step—she married a man who did not meet her father’s approval. A printman, Richard R. Donnelley, recently returned from New Orleans, where he had been foreman of the daily newspaper *True Delta*. Dick was a seasoned veteran by the time he was twenty-six, with stints in his hometown of Hamilton, Ontario, then Chicago, then



Shenston’s manner of printing,
The Berean

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New Orleans. Now, with that abhorrent war looming in the states, he was back in Hamilton, partnering again with Alex Lawson, printing hymnals and books of poetry.

Perhaps Shenston didn't consider Dick appropriate for Naomi because he was just a jobber with ink under his nails or because he was planning to return to the states or because he wasn't a Baptist. Naomi was determined to marry him anyway, and Shenston retaliated by turning her out of his house. (And as she left, did he hand her a self-published missive with a title like "What the Scriptures Say about the Injurious Effects of an Unequally Yoked Marriage"?) The news spread around town and eventually reached Eben, who wrote of the ouster in his diary. Naomi and Dick lived in the area for a brief time, then moved to Chicago.

Things went well for the Donnelleys in Chicago until 1871, when many of the city's stately buildings, including their home on North LaSalle and Dick's printing business, were destroyed in a fire sparked by an ignoble lantern kicked over by cow or a human or a freak night wind. What started small quickly became hellish and jumped the river, its fingers of flame clawing farther and farther. Firenados, as they're called now, tore through the heart of Chicago like dancing devils. When the fire ended two days later, three hundred people were dead and three square miles scorched. Thankfully, Naomi and Dick and their young children survived. But insurance failed to cover Donnelly's business losses. (Does this sound familiar?)

Donations poured in from across the nation and from a small town in Canada—Brantford. Eight days after the fire, Naomi's father arrived in Chicago, with the Mayor of Brantford, to coordinate distribution of relief supplies shipped down from Canada. Clearly, he felt compelled to do something, anything, to bring relief. At a time of devastation and ruin, there is always the need to give, to forgive, to give in.

It turns out Naomi was as steadfast a Baptist as her father. After the fire, the Donnelleys moved west of

the city, and Naomi immersed herself in church work, faithfully attending Sunday services and prayer meetings, superintending sewing classes at her church's mission, and co-founding the Women's Baptist Home Mission Society. (Later, Naomi would travel to Oklahoma, as chair of the society's board of directors, to deal with an Indian congregation facing disapproval for celebrating communion without an ordained minister present.)

When fire stopped the presses, Dick could have returned to his hometown and partnered again with Lawson, getting out the Hamilton Spectator newspaper. But he had bigger plans, and soon he was jobbing an ever-widening range of publications in his rebuilt five-story building at Clark and Adams on new-fangled steam-powered presses, printing "large, clear, open type which can be read with ease by young and old." Dick was master of the dime novel business, and the two-hundred-plus volumes of his Lakeside Library—titles like *The Wandering Heir*, *Going to the Bad*, *Terrible Temptation*—were selling like crazy around the nation. As was the *Lakeside Cook Book*, written by his wife. So Naomi was not only a mother and dedicated church lady, but the author of recipes and household hints and useful information. Very much like father, like daughter.



Richard and Naomi Donnelly circa 1865

Years later, T.S. Shenston's pen was busy again, with *Gleanings*, a compilation of excerpts from his favorite religious literature. In the middle of five hundred passages on topics like faith and prayer, trust

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and belief, he inserted a telling illustration of his own composing:

Suppose a kind father was to place himself in a deep dark cellar just under the trap-door leading to it, and his wife should request their six year old daughter to jump down through the trap-door into the cellar, assuring her that her father was in the cellar, and would assuredly catch her in his arms, inasmuch as he could see her notwithstanding she could not see him. Having full faith in her mother's words, she makes the jump, and is safely caught in the arms of her father; and for which simple act of faith the love of her parents is intensified.

And thus, Naomi's father, whose Bible was infallible and whose beliefs were dogmatic, made it a matter of the heart.

I know a little something about a father disapproving of his daughter's future spouse. I know that when the father rebukes the daughter face-to-face or in a long typewritten letter peppered with Bible verses, it makes her cringe. But the daughter goes ahead with the marriage anyway. And for years, the denunciation lies still in the inmost recesses of the mind or in the bottom of a cardboard box stored in the daughter's basement. As she moves on in life, from place to place and cause to cause, the box full of the moldering past moves with her. Then comes the day when the daughter and the father are drawn together because of some terrible event or natural disaster. And in voices singed with pain, they find themselves speaking clumsy words, words not for print. And disapproval has nothing more to do with it, absolutely nothing. Here's the thing about the ties that bind: they last longer than condemnation.

Author's note: The diaries of Ebenezer Muir Rice (1840–1871) were recently donated to the Canadian Baptist Archives at McMaster Divinity College in Hamilton, Ontario.

PHOTO CREDITS:

Thomas Strachan Shenston, circa 1869, Inmates Orphans' Home, Toronto Public Library, reprinted with permission.

Title Page, The Berean, D.B. Weldon Library, University of Western Ontario, used with permission.

Shenston's manner of printing, The Berean, D.B. Weldon Library, University of Western Ontario, used with permission.

Richard and Naomi Donnelley, circa 1865, R.R. Donnelley & Sons Company Archives, University of Chicago Library, used with permission.

Joyce H. Munro has returned to a first love—creative writing—after a career in college administration. She holds a Ph.D. from Vanderbilt University. Her articles on educational leadership and professional development have appeared in academic journals, and her books have been published by McGraw-Hill, Dushkin, and ETS. Her creative writing can be found in *Circa*, *Topology*, *Crosscurrents*, *Hamilton Arts & Letters*, *Boomerlit*, *As You Were: The Military Review*, *ArtAscent*, and elsewhere.

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WHO SPEAKS FOR THE EARTH? THREE STORIES IN ENVIRONMENTAL LAW

By Julia A. Travers

Dr. Seuss's grumpy, beleaguered, and beloved Lorax character says, "I speak for the trees, for the trees have no tongues." This poignant children's book brings some interesting questions to mind—who speaks for the earth in courts around the world, and for the rights of the planet itself? Is our species held guilty as a whole of harming the earth? Who is held responsible by law, who commits ecocide, who represents the earth, where do these cases play out, and are they successful? Here are three contemporary stories in environmental law that offer some unique perspectives on these questions.

THE INTERNATIONAL CRIMINAL COURT

In September of 2016, the International Criminal Court (ICC) in The Hague released a case-selection policy document stating that it would be bringing new focus to crimes relating to the destruction of the environment and to illegal land grabs.¹ Here is the specific wording: they will "give particular consideration to prosecuting Rome Statute crimes that are committed by means of, or that result in, inter alia, the destruction of the environment, the illegal exploitation of natural resources, or the illegal dispossession of land." The Rome Statute under which the ICC functions already mentions "damage to the natural environment" and "forced displacement" in its description of crimes and regulations.² The new specific focus on environmental crimes is significant because, as Adam Taylor of the *Washington Post* explains, it signals that the ICC is offering their "expertise and clout to aid the investigation[s]."³

The work of environmental activism groups, envi-

ronmental law firms, and international criminal law firms around the world may be altered or boosted by this development. The same *Washington Post* article mentions the law firm Global Diligence as an example of one group that welcomes this policy announcement. Global Diligence has lodged a case in Cambodia accusing the elite of forced land-grabs that displace indigenous groups and dispossess them of both their natural environment and cultural heritage. Richard Rogers, a partner with Global Diligence, said that "the ICC Prosecutor has sent a clear message that such offences may amount to crimes against humanity and can no longer be tolerated."

Global Witness is an advocacy group that has also noted the importance of the ICC policy focus. Their Executive Director Gillian Caldwell said:

Company bosses and politicians complicit in violently seizing land, razing tropical forests, or poisoning water sources could soon find themselves standing trial in The Hague alongside war criminals and dictators.⁴

FROM DAKOTA TO THE UNITED NATIONS

In another interesting recent story that quickly went from local to international news, the United Nations weighed in on the case of the Dakota Access oil pipeline in favor of the Standing Rock Sioux Tribe. The tribe is represented by Earth Justice, the United States' largest non-profit environmental law organization whose motto is "because the earth needs a good lawyer." They filed a lawsuit against the U.S. Army Corps of Engineers for "violating the National Historic Preservation Act and other laws, after the agency issued final permits for a massive crude oil pipeline stretching from North Dakota to Illinois."⁵ Members of the Standing Rock Sioux Tribe have been camped with other supporters in peaceful protest at the proposed pipeline site, and they addressed the United Nations in September of 2016. Daniel J. Graeber of United Press International reports that Victoria

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Tauli-Corpuz, a United Nations special envoy for the rights of indigenous people, “called for a halt to the pipeline’s construction because it’s seen as a threat to drinking water supplies and some of the sacred sites of the Standing Rock Sioux Tribe.”⁶

Construction was halted in December but in January, President Trump signed an executive order to reopen the pipeline plans and negotiations. The Standing Rock Sioux Tribe plans to continue their fight—they said on Facebook his actions violate the law as well as tribal treaties, and “Nothing will deter us from our fight for clean water.”⁷

YOUNG PEOPLE SUE THE U.S. GOVERNMENT OVER CLIMATE CHANGE

I am reminded when reading about these environmental cases of a quote without a clear source that is often attributed to Native American cultures: “We do not inherit the earth from our ancestors, we borrow it from our children.” Those who work to carry out these cases, who create new precedents and interpret and uphold existing environmental laws, are working in the name not only of our present human population but of generations to come. With that in mind, another case of interest is one in which twenty-one young people are suing the U.S. government and president for not acting effectively to stop climate change.

The suit against the government is part of a multi-year campaign by the organization Our Children’s Trust and has support from former NASA climate scientist James Hansen, among others. The group aims to empower youth to campaign for their right to live in a healthy environment. Their site explains that through their programs, “youth participate in advocacy, public education, and civic engagement to ensure the viability of all natural systems in accordance with science.” They have filed petitions and complaints on behalf of young people throughout the United States. A CNN article entitled “Climate Kids Take on the Feds” quotes Xiuhtezcatl Tonatiuh, one of the plaintiffs who

appeared in court in March of 2016:

My generation is going to be inheriting the crisis we see all around us today. We are standing up not only for the environment and the Earth and the atmosphere but for the rights we have to live in a healthy, just, and sustainable world.⁸

It’s clear from just these few stories that there are many diverse contemporary voices speaking for the earth in court. Here’s another related quote: “A society grows great when old men plant trees whose shade they know they shall never sit in.” Along with actual trees, perhaps some of the metaphorical trees we plant are these cases in which we stand up for the earth among our fellow human beings. Through this environmental legal work we plant seeds, grow roots, and provide shade that future environmentalists will rely on when they, in turn, speak for the earth.

Julia A. Travers is a journalist and writer. Her work appears with Earth Island Journal, Not Impossible, OnBeing, and SciArt Magazine, among other publications. Visit her at jtravers.journoportfolio.com and on Twitter @traversjul.

NOTES

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THE MANY FACETS OF URBAN NATURE

By Gavin Van Horn

Review of: Terrell F. Dixon, ed. *City Wilds: Essays and Stories about Urban Nature*. Athens: The University of Georgia Press, 2002.

Writing this review came with a built-in challenge: What mix of qualities makes an urban nature anthology, now almost fifteen years old, worthwhile?

First on the list should be the excellence of the writing. *City Wilds* is certainly brimming with creatively wrought pieces. There is Michael Aaron Rockland's "Big City Waters," a tale about the author and his friend circumnavigating Manhattan by canoe, reminding readers that despite its monumental buildings New York City "is a liquid place" of islands. There is Chet Raymo's "The Silence," which opens with a time-stopping near-death collision that unfolds into a series of ethereal reflections on the vacuum of space, the explosion of stars, and the transporting impacts of silence found in nearby nature. Two essays caused me to audibly exhale a wow after finishing the last sentence—Rebecca Johnson's "New Moon over Roxbury," a meditation on black people's relationship to land and the city as well as her own practice of astrological gardening ("If I worship at all, it is at the compost pile. It receives my most consistent offerings."); and Helena Maria Viramontes's "The Moths," a beautifully disturbing story about the intercessory role of moths during a young girl's final moments with her dying grandmother. On the lighter side, Emily Hiestand's "Zip-A-Dee-Do-Dah" stands out, full of wry observations about the goings-on of nesting blue jays—"the bird of the postmodern, of invention and recycling, of found art." Among these and the many other excel-

lent essays in the collection, Stephen Harrigan's "The Soul of Treaty Oak" is masterful, a story that is equal parts murder mystery, mystical circus sideshow, and compassionate commentary about the human search for connection—in this case, connection with the venerable but beleaguered Treaty Oak in Austin, a being "older than almost any other living thing in Texas, and far older than the idea of Texas itself." The Treaty Oak becomes a magnet for clashing values after it is intentionally poisoned.

Another signifier for a strong collection of urban nature essays would be the breadth of its geographical and cultural scope. Are diverse perspectives included that shed light on the many ways of being human in particular places? Again, *City Wilds* hits the mark—or many marks. Essays in the book are "clustered" by geography, as editor Terrell F. Dixon notes, beginning with major cities in the northeastern part of the United States and then taking us on a circuitous road trip around and through the country before arriving on the Pacific coast. Reading across these diverse regions, one can better appreciate how distinctive places inform experiences of urban nature. The multiculturalism of the book is also impressive, with familial customs and dynamics intersecting with neighborhood landmarks and comforting aromas emanating from kitchens. The essays do not shy from delving into the shadow-side of difference. "Thank God It Snowed," by Ronald L. Fair, packs an emotional wallop, as the author recalls the healing rains and snows of his childhood winters, weather that washed away "the gray grit-cloud that tried to remind us of our place in society," providing relief and temporarily leveling the sins of neglect in a segregated Chicago. Many essays, like Fair's, return to vivid impressions of childhood, a time when local nature serves as the anchor of memory and transformation, from "the vacant lot that was the shortcut between worlds" (Denise Chávez, "Willow Game") to large bodies of water "alternately tranquil and wild, changing colors like a mood ring" (Susan Power, "Chi-

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ago Waters”) to those secret spaces between buildings that are sites of comfort and life-changing points of reference “far away from where our mothers could find us” (Sandra Cisneros, “The Monkey Garden”).

A final strength of this collection, one I wasn’t expecting, is the wide mix of genres—a reminder that a good nature story comes in many packages, from straight-ahead travel narrative to magical realism. The inclusion of fictional short stories adds a surprising layer of depth, pushing against the boundaries of conventional nature writing. One of the more delightful of these is Richard Brautigan’s “The Cleveland Wrecking Yard,” in which the narrator visits a salvage shop for a piece of a “used” trout stream, sold by the foot and stacked in various lengths (waterfalls sold separately)—an effective satire of the commodification of nature and an affirmation of the unquantifiable value of a living river and its myriad ecological relationships.

Taken as a whole, *City Wilds* is simultaneously a retrospective and an inspiration for aspiring urban nature writers, disclosing the diverse ways the story of a city can be told. Dixon deserves recognition for his prescience in assembling one of the first, if not the first, multi-author collections of such writings. With the exception of a few outliers in the volume (Dubkin, 1947; Brautigan, 1968; Fair, 1972), most of the essays were written in the 1990s, a period of time still characterized, Dixon observes, by the idea “that real nature stops at the city limits sign.” *City Wilds*, without necessarily aiming for it, is thus part history lesson, representing a moment when the fuzzy outlines of a new category of writing were emerging, and the city began to be regarded as a worthy site of investigation.

Good writing is good writing, and good writers are adept at transforming landscapes into breathing presences alongside their human characters. Yet Dixon points out some features that may distinguish urban nature writing from other types of nature-based stories. Urban nature writing tends to focus on accessible areas (“nearby nature”), nature at smaller scales

(a single butterfly instead of the Grand Canyon), the humorous or comical rather than the death-defying (everyday experience), and themes of interdependent community rather than heroic self-reliance (how we relate rather than what we conquer or endure). Perhaps all nature writing reckons with being human among other creatures, but urban nature writing lingers on the small-scale dramas of *inhabiting* place.

Now let’s circle back to the question of age. Should you invest in a book that is a decade and half old? I would answer by saying that high-quality writing, of any genre, tends to age well. *City Wilds* has aged well, in part because the essays are already a “best of” from various writers. With increasing numbers of people living in cities, it could be that *City Wilds* has become more relevant as time has passed. Robert Michael Pyle, in his contribution to the volume—a now-classic essay entitled “The Extinction of Experience”—provides *City Wilds* with what could be its thesis: “Many people take deep satisfaction in wilderness and wildlife they will never see. But direct, personal contact with other living things affects us in vital ways that vicarious experience can never replace.” The essays underscore this point, showing just how formative those everyday experiences are to our sense of personal identity, community, and care for the more-than-human world. Plucked like pigeon feathers from city alleys, slugs from garden leaves, and caddis-fly nymphs from the shallows of recovering urban rivers, the stories in *City Wilds* reveal again and again the small revelations that await us in the spaces we may consider the most ordinary and homey.

Is this anthology worth your time? Yes. Emphatically. If you have any interest in urban nature writing whatsoever—in reading about cities, in writing about cities, in understanding the human capacity to interact and engage with other species—this book should be on your shelf, dog-eared and underlined. Take it on the subway. Bring it onto the balcony of your high-rise apartment. Cozy into a weathered bench in a pocket

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park, allowing the chatter of birds and squirrels to envelope you, and look up every once in a while, between essays, to see for yourself if the city doesn't sparkle more because of the book in your hands.

Gavin Van Horn is Director of Cultures of Conservation at the Center for Humans and Nature. He is co-editor of *City Creatures* (2016) and *Wildness: Relations of People and Place* (forthcoming 2017). An earlier version of this book review appeared at: <http://www.thenatureof-cities.com/2016/08/29/timely-tales-of-urban-nature/>.

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CHN BOOKSHELF

A regular feature calling attention to important books and articles that CHN staff, board, and collaborating scholars are reading and recommend. *Quot libros, quam breve tempus.*

J. M. Bernstein, *Torture and Dignity: An Essay on Moral Injury* (University of Chicago Press 2015).

H. Dreyfus and C. Taylor, *Retrieving Realism* (Harvard University Press 2015).

M. Engelhard, *Ice Bear: The Cultural History of an Arctic Icon* (University of Washington Press 2016).

R. Grusin, ed. *The Nonhuman Turn* (University of Minnesota Press 2015).

B. Hale, *The Wild and the Wicked: On Nature and Human Nature* (MIT Press 2016).

E. Kohn, *How Forests Think: Toward an Anthropology Beyond the Human* (University of California Press 2013).

O. H. Pilkey, L. Pilkey-Jarvis, K. C. Pilkey, *Retreat from a Rising Sea: Hard Choices in an Age of Climate Change* (Columbia University Press 2016).

N. L. Rosenblum, *Good Neighbors: The Democracy of Everyday Life in America* (Princeton University Press 2016).

R. Scranton, *Learning to Die in the Anthropocene: Reflections on the End of a Civilization* (City Lights Books 2015).

B. Tokar, *Toward Climate Justice: Perspectives on the Climate Crisis and Social Change* (New Compass Press 2014).

R. M. Unger and L. Smolin, *The Singular Universe and the Reality of Time* (Cambridge University Press 2015).

THE LAST WORD



MICHAEL JAWER

DO ONLY HUMANS HAVE SOULS OR DO ANIMALS POSSESS THEM TOO?

In common parlance, the word “soul” pops up everywhere. We may speak of a vast, soulless corporation or describe an athlete as the “heart and soul” of his team. Soul music gets us swaying. We want our lover, body and soul. In each case, “soul” connotes deep feeling and core values. “Feelings form the basis for what humans have described for millennia as the... soul or spirit,” the neuroscientist Antonio Damasio eloquently expounds in his groundbreaking book, *Descartes’ Error* (1994).

Today, studies increasingly show that many non-human beings feel. Elephants appear to feel grief, while dolphins and whales express joy, or something much like it. Parrots can become cranky, pigs and cows terrified, chickens saddened, monkeys seemingly embarrassed. Experiments have shown that rats become agitated when seeing surgery performed on other rats and that, when presented with a trapped lab-mate and a piece of chocolate, they will free their caged brethren before eating. There’s even evidence that rats take pleasure in being tickled.

None of this will come as a surprise to pet owners or anyone who has observed virtually any kind of animal for any length of time. Science is rediscovering what Charles Darwin, in his book *The Expression of the Emotions in Man and Animals* (1872), concluded: that the variations between humans and other species in their capacity to feel and express emotion are differences in degree rather than in kind. It’s a short step from there to recognition that individual animals have personalities, and to reckon that not only do they live, they have lives.

One might even argue that other creatures are more cognizant of feelings than

humans are because they possess a primary form of consciousness: they are aware of themselves and their environment but are less burdened by complexities such as reflection and rumination that typify human consciousness. They live closer to the bone, so to speak. Jeffrey Masson, author of *When Elephants Weep* (1995), has remarked that animals possess feelings of “undiluted purity and clarity” compared to the “seeming opacity and inaccessibility of human feelings.” Furthermore, we should consider that humans may not experience the full range of feelings found in the animal kingdom. As Humane Society ethologist Jonathan Balcombe points out: “In light of their sometimes vastly different living circumstances and sensory capabilities, other species may experience some emotional states that we do not.”

Sentience—the capacity of an organism to feel—is fundamental to being alive. If human beings have souls, they must be more about sentience than consciousness. We are motivated far more by passion than by intellect—what we feel deeply is what drives us, for good and ill. In his book *Pleasure: A Creative Approach to Life* (1970), the late psychoanalyst Alexander Lowen meditated on these connections, proposing that “the soul of a man is in his body. Through his body a person is part of life and part of nature...If we are identified with our bodies, we have souls, for through our bodies we are identified with all creation.” As long as we are alive—and therefore feeling—we are connected to one another and to the natural world. We are, in a word, ensouled.

Extraordinary examples of ensoulment among non-human animals abound. Ethologist Adriaan Kortlandt

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once observed a wild chimp in the Congo ‘gaze at a particularly beautiful sunset for a full fifteen minutes, watching the changing colors,’ forsaking his evening meal in the process. Elsewhere, African elephants belonging to the same family or group will greet one another after a separation with a loud chorus of rumbles and roars as they rush together, flapping their ears and spinning in circles.

Thanks to the Internet, there’s a steady stream of examples of animals demonstrating compassion, from an ape saving a crow to a gorilla protecting a three-year-old boy when he fell into her enclosure. A particularly striking case of animal gratitude occurred in 2005 off the California coast, where a female humpback whale was found entangled in nylon ropes used by fishermen. As recounted by Frans de Waal in *The Age of Empathy: Nature’s Lessons for a Kinder Society* (2009): “The ropes were digging into the blubber, leaving cuts. The only way to free the whale was to dive under the surface to cut away the ropes.” The divers spent an hour at the task, an especially risky one given the sheer strength of the animal’s tail. “The most remarkable part came when the whale realised it was free. Instead of leaving the scene, she hung around. The huge animal swam in a large circle, carefully approaching every diver separately. She nuzzled one, then moved on to the next, until she had touched them all.”

Animals that express gratitude, play, contemplate nature, act to save a fellow creature, or react mournfully to the loss of family members or other close companions are all, in my view, demonstrating aspects of connectedness. Such connectedness is the root of spirituality—with the

capacity to feel and emote being central.

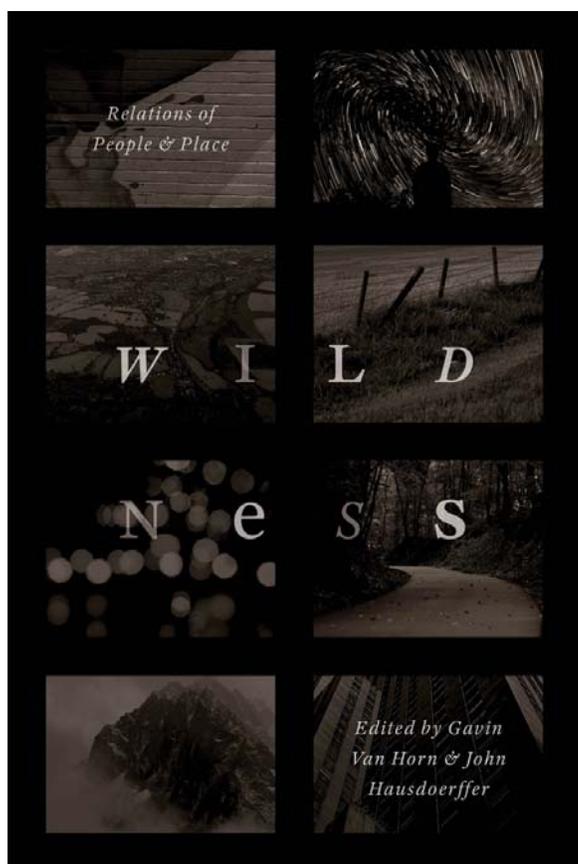
In the end, soul may be a profound matter of fellow feeling. The stronger the capability of a given species for fellow feeling, the more that species can be said to exhibit soulfulness. To view things in this way offers another important step in humanity’s progression towards understanding its place in creation—and to appreciate the inheritance we hold in common with other sentient beings on this increasingly small, restive, and fragile planet.

Michael Jawer is a researcher and writer based in Washington, DC. He blogs for Psychology Today and is the co-author, with Marc Micozzi, of *The Spiritual Anatomy of Emotion* (2009) and *Your Emotional Type* (2011). He can be reached at mike.jawer@gmail.com.

WILDNESS

RELATIONS OF PEOPLE AND PLACE

Edited by Gavin Van Horn and John Hausdoerffer



Wildness brings together esteemed authors from a variety of landscapes, geographies, cultures, and backgrounds to share their stories about the interdependence of everyday human lifeways and wildness, revealing the many ways in which human communities can nurture, adapt to, and thrive alongside their wild nonhuman kin. With this book, we gain insight into what wildness is and could be, as well as how it might be recovered in our lives—and with it, how we might unearth a more profound, wilder understanding of what it means to be human.

“This amazing amalgam goes at the issue of nature, wildness, and our relationships to it via personal story, lyrical verse, and reflection. It is a return to something that works most effectively—a diversity of noteworthy voices tuned to a single issue—but that is so diverse in its assemblage and affect as to be totally unique and useful. Comprehensive, inclusive, and evocative, comfortable enough to be considered literature but groundbreaking enough to enter into discussions of policy and planning for the future, *Wildness* is storytelling and word-singing at its best. It is also a book I simply (and badly) want on my bookshelf to pull down and read words that flow like water but have the lasting impact of fire.”

— J. Drew Lanham, author of *The Home Place: Memoirs of a Colored Man's Love Affair with Nature*

Gavin Van Horn is the director of Cultures of Conservation for the Center for Humans and Nature, a nonprofit organization that focuses on and promotes conservation ethics. **John Hausdoerffer** is a fellow for the Center for Humans and Nature as well as the executive director of the Center for Environment & Sustainability at Western State Colorado University, where he is professor of environmental sustainability and philosophy.

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