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Expanding our Natural and Civic Imagination

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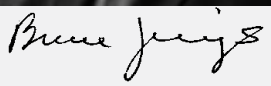

CROSSING THE RUBICON, OR CONSERVING ITS BOUNTY?

THE ECOLOGICAL CRISIS OF OUR TIME calls for three great transformations in our worldview and in the relationship between humans and nature. The first of these is a transformation in our frameworks of thought (habits of mind). The second is a reorientation in the way we live, feel, and desire, individually and collectively (habits of the heart). The third, melding mind and heart, is a renewal and restructuring of our moral imagination (habits of conscience).

Changing our habits of mind involves critical analysis of our concepts and categories and bringing the best scientific knowledge to bear on our understanding of the world. Changing our habits of the heart involves the examination of the wellsprings of human behavior and motivation and of the subtle forces influencing what we perceive to be our wants, our needs, and our rights in a consumption-oriented market society. Changing the content of our conscience involves the honing of the social and ethical principles and values that guide our actions and that form the justification and functioning of our major economic and political institutions.

Envisioning transformations like these in fundamental aspects of our way of life seems unrealistic until one considers that our society today is itself the product of a "great transformation" no less far-reaching and relatively recent. This took place in the United States (and in the Western world more generally) little more than a century ago, with the advent of a petroleum-based technology and a market society. In the past century land, labor, and indeed all life have been transformed, conceptually and practically, into commodities and have lost their meaning as systems or subjects of intrinsic value.

A pivotal time has come again. We live once more at a critical juncture in human and environmental history, a time in which the underlying conceptual, practical, and ethical foundations that sustain our lives are shifting. Major indications of this are all around us on a global scale. But one of the most striking examples, perhaps, comes not from large-scale climate change or loss of biodiversity, but from the smallest corner of the living world, the domain of what is currently known as "synthetic biology."

In late May, Craig Venter and Hamilton Smith announced that they had made a bacterium with an artificial genome—a creature with no ancestor. This is not the first instance of the synthetic assembly of DNA, but it is the most complex to date, and it is an action different in kind, not just in degree, from the genetic engineering that has been going on for nearly fifty years. Heretofore, human intervention has been limited to the manipulation of pre-existing components of life. Today we stand at the threshold of the purposeful creation of artificial life. An editorial on May 20, 2010, in *The Economist* magazine said—I think without undue hype—that "a Rubicon has been crossed. It is now possible to conceive of a world in which new bacteria (and eventually new animals and plants) are designed on a computer and then grown to order."

The essays in this issue of *Minding Nature* form a contrast to the world of synthetic biology in a number of interesting ways.

Juliet Schor in her essay

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here, and more fully in her recently published book, gives us a paradigm of living nature whose bounty can be made available to promote human flourishing, but not through extraction or technological manipulation so much as through adjustments in the way we live and the way we relate to other life. These are adjustments of the kind I referred to earlier—transformations in our habits of mind, heart, and conscience. The supporters of synthetic biology argue that these techniques may hold the key to a new kind of green technology, operating at the nano-level, partly organic and partly inorganic, or perhaps some hybrid form that renders those categories obsolete. Meanwhile, Schor points out that we need "a new economy, not just an alternative energy system."

In their wide-ranging essay on water, the remarkable molecule without which life as we know it might not have evolved on earth and certainly could not now subsist, Peter Brown and Jeremy Schmidt remind us of the hubris and the fantasy of human control over natural systems. Their alternative notion of "compassionate retreat" is based on a kind of knowledge that grows out of lived interaction within webs of complexity, not on abstract conceptions that are mechanistic and deliberately simplifying. This stance is also based on an appreciation of our relative ignorance concerning the evolutionary process that brought about—and the holistic processes that sustain—these webs of complexity. To be sure, the challenge of water management stands on the opposite end of the biological spectrum from the work of synthetic biologists; but if indeed the living world does present a spectrum, rather than a set of incommensurable domains, then the mindset of "management" may need reconceptualization no less in the realm of the genome than in the realm of the hydrologic system.

Articles by Curt Meine and Marybeth Lorbiecki each explore a culture of conservation that resonates with both plenitude and the wisdom of compassionate retreat. Reflecting on seventy-five years of conservation efforts in the United States, Meine vividly reminds us of the need for a grasp of complexity and accommodation to natural limits, rather than a search for simplification and control. Like Schor, he would bring the experience of the conservation movement to bear on economic and policy questions.

There is little point in raising the question of cultural transformation without reckoning with the role of religion. Lorbiecki argues that the major religious traditions and denominations must be connected to the conservation perspective if the latter is to gain more widespread political and moral support. The view she provides of the synergy between religion and conservation is a general one, but she focuses explicit attention on Roman Catholicism and reveals the deep resources of thought and feeling that faith tradition holds for a sustaining connection, a vision of right relationship, between humanity and nature.

Finally, contributors to this issue's Reviews and Reflections, center on ethical questions, broadly defined, including the basis of a new ethics of place; the ethical reception by society of new forms of biotechnology, and the ethical responsibility of the scientific community in our current time of consequences.

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Overall, the essays in this issue of *Minding Nature* serve to stimulate and guide our reflection on what might be called the "paradox of human being." This paradox resides in the fact that we are at once *dependent* on the world of natural life and yet *powerful enough* to break away from it by creating an artificial world and a technological simulacrum of natural life.

A world of made
is not a world of born—pity poor flesh

and trees,poor stars and stones,but never this
fine specimen of hypermagical

ultraomnipotence. We doctors know

a hopeless case if—listen: there's a hell
of a good universe next door; let's go

E. E. Cummings
"Pity this Busy Monster, Manunkind"

Heretofore in history manifested only in limited ways and on local scales, this human power to manipulate the natural and to create the artificial has reached the threshold of world-transforming potential on a global scale. Our lot is to be what the philosopher Alasdair MacIntyre has called "dependent rational animals." Our temptation is to believe that we are more than this, or that our reason can be detached from our dependency and our embodiment in nature.

The Principles of Plentitude

By JULIET B. SCHOR

Global capitalism shattered in 2008. The financial system came frighteningly close to a total collapse and was saved only by government guarantees and massive injections of cash. An astounding $50 trillion of wealth was erased globally. Economic pain drove people into the streets around the world, from Iceland to Greece, Egypt to China.

Since then, the global economy has been rescued, but it hasn't been fixed. That will require fundamental changes. Climate destabilization, economic meltdown, and the escalation of food and energy prices are warning signs from a highly stressed planet. Ecologists have defined a number of safe operating zones for the earth's complex systems and are finding that human activities have already led us outside a number of them. But the mainstream conversation has been stalled by fatalism. We're better at identifying what can't be done than what we need to accomplish.

There *is* a way forward, and I call it plenitude. The word calls attention to the inherent bounty of nature that we need to recover. It directs us to the chance to be rich in the things that matter to us most, and the wealth that is available in our relations with one another. Plenitude involves very different ways of living than those encouraged by the maxims that have dominated the discourse for the last twenty-five years. It puts ecological and social functioning at its core, but it is not a paradigm of sacrifice. To the contrary, it involves a way of life that will yield more well-being than sticking to business as usual, which has led both the natural and economic environments into decline.

Like most of the sustainability visions that have been offered in recent years, plenitude requires that we adopt cutting-edge green technologies. Without them we cannot ensure the survival of what humans have constructed, and we risk plunging into a hellish future. But it's not a techno-fix. Solving our problems in the time we have available is not possible if all we do is change our technology. We will not arrest ecological decline or regain financial health without also introducing a different rhythm of work, consumption, and daily life, as well as alterations in a number of system-wide structures. We need an alternative economy, not just an alternative energy system.

A body of research, writing, and practice on economic alternatives has been developing. It is part of the larger movement for sustainability that began in earnest in the 1980s. At first, these perspectives had a hard time piercing the bubble surrounding the growth economy. Today, there's newfound receptivity as people recognize that a true recovery will require more than lifelines and bailouts.

The logic driving plenitude is largely economic, focusing on efficiency and well-being. I'm betting that the intelligent way to act, for both individuals and society, is the one that will make humans, non-human species, and the planet better off. Plenitude promises smarter economic arrangements, not just technological improvements. It's a careful attention to multiple

sources of wealth. In this way, it departs from messages of voluntary simplicity and critiques of consumer culture that contend that less is more, that income and consumption are overrated. Research has shown that outside of poverty they are, but that realization doesn't take us far enough. The bigger prize, true affluence, comes through changes that yield new efficiencies: getting more from less.

> "Plenitude ... puts ecological and social functioning at its core, but it is not a paradigm of sacrifice. To the contrary, it involves a way of life that will yield more well-being than sticking to business as usual...

The version of plenitude that I describe here is addressed in large part to inhabitants of wealthy countries and wealthy inhabitants of poor ones. But most, although not all, of the principles of plenitude and the economics underlying it are also relevant for lower-income households in poor countries. In its general outlines, if not specifics, it's a widely applicable vision of economic life.

Plenitude is also about transition. Change doesn't happen overnight. Creating a sustainable economy will take decades, and this is a strategy for prospering during that shift. The beauty of the approach is that it is available right now. It does not require waiting for the clean-tech paradigm to triumph. It doesn't require getting government on board immediately. Anyone can get started, and many are. It was the right way to go before the economic collapse, in part because it predicted a worsening landscape. It makes even more sense in a period of slow growth or stagnation. As individuals take up the principles of plenitude, they are not merely adopting a private response to what is perforce a collective problem. Rather, they are pioneers of the micro (individual-level) activity that is necessary to create the macro (system-wide) equilibrium, to correct an economy that is badly out of balance.

That balance won't develop automatically. All large-scale transformation requires collective arrangements to succeed. We need environmental accounting, a mechanism to reduce carbon emissions, and an end to fossil fuel subsidies. We need new labor-market policies. We need to reform our health care, education, and retirement security systems. But while we work for those changes, here's a vision for a way to live that respects both the awesome place we call earth and all who live upon it.

THE FUNDAMENTALS OF PLENITUDE

From the perspective of the individual, there are four principles of plenitude. The first is a new allocation of time. For decades, Americans have devoted an increasing fraction of their time and money to the market—working longer hours, filling leisure time with activities that require more income per unit of time, and buying, rather than making, more of what they consume. It's time to reverse this trend and diversify out of the market. This doesn't just mean the stock market, although its recent volatility suggests that's one market to which this point applies in spades. Today's smart strategy for many, if not most, households will be to begin a shift away from the formal and centralized sets of institutions and arrangements that are called the market. By "the market" I mean business-as-usual (BAU) economic activity. BAU is a term that came out of the climate discourse to indicate what would happen if we didn't address rising emissions. Here I use it to indicate the continuation of the current economic rules, practices, growth trajectory, and ecological consequences of production and consumption. It especially refers to the large corporate entities that dominate the market and are heavily invested in it. For individuals, relying less on the market spreads risk and creates multiple sources of income and support, as well as new ways of procuring consumption goods.

Concretely, what this means is a moderation in hours of work. For time-stressed households with adequate incomes, it likely means making trade-offs of income for time. Reclaiming time frees up resources to invest in ecologically restorative activities and creates the opportunity to replenish the human connections that were depleted in the boom years. Of course, millions have had an altered equation of time and money painfully thrust upon them through unemployment or other losses of income. For that group, which already has a surfeit of time and not enough money, the advice involves moving forward with plans that are less centered on full-time employment in the BAU economy and more oriented to the emergent sustainability sector, which includes both businesses and the parallel economy developing amid the wreckage of the collapse. This encompasses areas such as household food cultivation, home construction and renovation, and

community initiatives such as barter and bulk buying.

This brings us to the second principle of plenitude, which is to diversify from the BAU market and "self-provision," or make, grow, or do things for oneself. Indeed, the rationale for working fewer hours in the market is not only, or even primarily, about reducing stress in daily life (although that is certainly important). Recovering one's time also makes self-provisioning possible and reveals a liberating truth: The less one has to buy, the less one is required to earn. The downturn has accelerated what was already a robust rediscovery of doing for oneself among sustainability pioneers. Plenitude aspires to transform self-provisioning from a marginal craft movement into something economically significant. That requires raising the productivity of the hours spent in these activities. As I argue in *Plentitude*, new agricultural knowledge and the invention of small-scale smart machines make it possible to turn household provisioning into a high-productivity—and economically viable—use of time.

> We don't need to be less materialist, as the standard formulation would have it, but more so. For it is only when we take the materiality of the world seriously that we can appreciate and preserve the resources on which spending depends.

These ideas reverse the direction most households have taken in recent decades and contradict what modern economics preaches, which is that specialization, in one skill or one job, is efficient. Specialization may have made sense when the market was offering better returns. Even as wages stagnated, ultra-cheap consumer goods were hard to turn down. Today, in a world of ecological and economic uncertainty and distress, putting all one's eggs in the basket of the capitalist market looks like a more dubious proposition.

The third principle of plenitude is "true materialism," an environmentally aware approach to consumption. In the United States, the speed of acquiring and discarding products accelerated dramatically before the crash. Consumers knew relatively little about where purchases came from and the ecological impacts of their production, use, and disposal. But many people do care and want to lighten the footprint of their spending.

Perhaps surprisingly, the route to lower impact does not require putting on a hair shirt. Nor does it entail making consumption less important. Indeed, the plenitude consumer is likely passionate about consuming and deliberate in the creation of a rich, materially bountiful life. We don't need to be less materialist, as the standard formulation would have it, but more so. For it is only when we take the materiality of the world seriously that we can appreciate and preserve the resources on which spending depends. Living sustainably does mean we can't reproduce a lifestyle of gas-guzzlers, expansive square footage per person, bottled water, and outsize paper consumption. But it doesn't mean we can't have fabulous clothes, low-impact electronic gadgetry, great local food, and a more leisurely mode of travel. Plenitude means that you will actually have time to take the slow boat to China if that appeals.

The final principle is the need to restore investments in one another and our communities. While social bonds are not typically thought of in economic terms, these connections, which scholars call social capital, are a form of wealth that is every bit as important as money or material goods. Especially in times of distress, people survive and thrive by doing for one another. Interpersonal flows of money, goods, and labor are a parallel system of exchange and savings. One casualty of an intense market orientation is that community has gotten thinner and human ties weaker. People haven't had enough time to invest in social connection outside their primary families. By recovering hours, individuals are freed up to fortify their social networks.

> These...are the individual principles of plenitude: work and spend less, create and connect more.

These, then, are the individual principles of plenitude: work and spend less, create and connect more. In turn they yield ecological benefits—emit and degrade less—and human ones—enjoy and thrive more.

SHIFTING THE ECONOMIC CONVERSATION

In the fall of 2008, as panic swept through the financial system and the economy began to implode, there was a widespread sense that changes, even big changes, would be necessary. Business-as-usual was suddenly called into question. Even capitalism itself

was up for discussion. Within six months, only 53 percent of adults would agree that "capitalism is a better system" than socialism. (Twenty percent preferred socialism and 27 percent were not sure. Adults under thirty were about evenly divided between the two options.) But gradually, as conditions stabilized, the status quo reasserted itself. The mainstream conversation about how to reorganize the economy was back in neutral, especially when it came to fundamental questions about how our system is affecting the planet.

Some things did change. After three decades of dominance, conservative economics had lost credibility. Everyone agreed that we couldn't go back to the policies of the previous decade. In the United States, the litany of no-longer-permissibles included the mushrooming of household debt and a national savings rate of zero, the massive excess of imports over exports, an annual flow of $453 billion for imported oil, and a financial system run amok. The country needed more savings and investment, and the constituency for getting off fossil fuels had grown. But the backdrop for these views was a return to some version of normal, albeit a slimmed-down model. As a result, what was offered was a series of Band-Aids—bank and insurance company handouts, tax cuts to induce spending, automobile industry bailouts, and extended unemployment benefits. Some hoped that financial regulation and health care reform would be sufficient to ensure long-term stability. It's a long shot.

One reason the conversation reverted to its usual outlines is that macroeconomists, who focus on growth, employment, and the overall economy, have been slow to incorporate ecological data into their worldview. During 2007 and 2008, the same period that the housing and credit markets were collapsing, dramatically bad news was surfacing on the climate front. Developments since the 2007 Intergovernmental Panel on Climate Change (IPCC) report, whose data ended in 2006, have been grim. Arctic sea ice was melting at hitherto unimaginable rates, and oceans were rising at more than double the IPCC report's maximum possibility. Drought conditions were spreading. World emissions were sharply up in 2007, and in June 2008, James Hansen, NASA's leading climate scientist, told Congress that the CO_2 target "we have been aiming for is a disaster." By February 2009, the news was worse, with scientists reporting that the speed of climate change was already beyond anything considered in the last round of models. Hansen and his colleagues warned that carbon dioxide levels beyond 350 parts per million are incompatible with preserving a planet "similar to that on which civilization developed." But we were already at 385 and rising.

Yet it was as if the people charged with tending the economy were unaware of the breaking news on climate. The main conversation was about how to put more money into people's hands and how to get them back to buying cars, any cars; building more houses, whatever their dimensions; and accumulating more stuff. The bailout and recovery efforts cost trillions, yet only 6 percent, or $52 billion, of the stimulus was actually "green." Amazingly, General Motors and Chrysler were handed $30 billion without a requirement for conversion to hybrids, much less any provision for the far more fuel-efficient mass transport that the nation desperately needed. The approach relied on reviving a highly destructive pattern of consumption and growth and the fiction that our economic system is basically sound. Barack Obama tried to do more to address ecological impacts but has made limited progress. As the world was hurtling toward an ecological precipice of unfathomable dimensions, the macroeconomic conversation was basically about how to get there faster.

What's more, the problem extends beyond climate. Research from the traditional sciences, as well as the thirty-year-old field of sustainability, is finding that ecosystems of all types are under threat. Humans are degrading the planet far faster than we are regenerating it. Dead zones are proliferating rapidly in the oceans; farmland is morphing into desert. Biodiversity is shrinking, and we're into the sixth mass extinction of species. If current trends continue, some scientists have warned that by 2050 the oceans will be devoid of fish, the primary source of animal protein for a billion people.

This is not to say that economists were intellectually stuck. Many were embracing key features of Keynesian economics, despite the fact that much of the profession had roundly and self-confidently rejected these ideas in the previous decades. Rediscovered Keynesian ideas included the wisdom of running government deficits, an understanding of the volatility of investors' "animal spirits" (optimism), and, above all, the fact that the market does not necessarily self-correct. However, the point of recent economic policy has been to put the pieces "back together" again—that is, to return to what we had, rather than to transform the system.

By contrast, on the street, people began moving on almost as soon as the economy started sinking. After the crash, the savings rate shot up and discretionary purchases plummeted. Research on how consumers were experiencing the collapse found that they were making major adjustments in their attitudes to spending, debt, and lifestyle. A declining fraction of the population considered appliances such as dishwashers, air conditioners, microwaves, TVs, and cable and satellite dishes to be necessities. Interview research in late 2008 found a five-stage process that began with a "goodbye *homo economicus*" epiphany and continued through to a recalibration of what is important in life. People talked about a shift from an economy of "me" to an economy of "we," from status-oriented spending to reengaging with the difference between needs and wants. The anthropologists who conducted the study were surprised to find this "larger, more existential debate." But the public is aware that the American way of life is not sustainable. Surveys I worked on as early as 2004 found that more than 80 percent of the population agreed that protecting the environment would require "most of us to make major changes in the way we live." The years since then have increased ecological awareness and urgency. There's no consensus on what to do, but there's recognition that business-as-usual is failing.

Brand economics has been tarnished. This comes after a period of unusual prestige. Within universities, the discipline had been riding high. Among the public, there has been tremendous interest in how economists think, with Paul Krugman's hugely popular writing, bestsellers such as *Freakonomics*, and ongoing columns, such as David Leonhardt's for the *New York Times,* devoted to the profession. But, with some notable exceptions, economists failed to see the financial, housing, and economic crises coming. Princeton's Uwe Reinhardt noted that they "slept comfortably" while Wall Street imploded. Yale's Robert Shiller has invoked the concept of "groupthink" to explain why. Whatever the reason, what occurred in 2007 and 2008 was a monumental blunder. We can't afford a repeat when it comes to the health of the planet.

And we don't have to. What's odd about the narrowness of the national economic conversation is that it leaves out theoretical advances in economics and related fields that have begun to change our basic understandings of what motivates and enriches people. The policy conversation hasn't caught up to what's happening at the forefront of the discipline.

One of the hallmarks of the standard economic model, which hails from the nineteenth century, is that people are considered relatively unchanging. Basic preferences, likes and dislikes, are assumed to be stable and don't adjust as a result of the choices people make or the circumstances in which they find themselves. People alter their behavior in response to changes in prices and incomes, to be sure, and sometimes rapidly. But there are no feedback loops from today's choices to tomorrow's desires. This accords with an old formulation of human nature as fixed, and this view still dominates the policy conversation. However, there's a growing body of research that attests to human adaptability. Newer thinking in behavioral economics, cultural evolution, and social networking that has developed as a result of interdisciplinary work in psychology, biology, and sociology yields a view of humans as far more malleable. It's the economic analogue to recent findings in neuroscience that the brain is more plastic than previously understood, or in biology that human evolution is happening on a time scale more compressed than scientists originally thought. As economic actors, we can change, too. This has profound implications for our ability to shift from one way of living to another, and to be better off in the process. It's an important part of why we can both reduce ecological impact and improve well-being. As we transform our lifestyles, we transform ourselves. Patterns of consuming, earning, or interacting that may seem unrealistic or even negative before starting down this road become feasible and appealing.

> "...there's a growing body of research that attests to human adaptability. ... As economic actors, we can change, too. This has profound implications for our ability to shift from one way of living to another, and to be better off in the process.

Moreover, when big changes are on the table, the narrow tradeoffs of the past can be superseded. If we can question consumerism, we're no longer forced to make a mandatory choice between well-being and environment. If we can admit that full-time jobs need not require so many hours, it'll be possible to slow down

ecological degradation, address unemployment, and make time for family and community. If we can think about knowledge differently, we can expand social wealth far more rapidly. Stepping outside the "there is no alternative to business-as-usual" thinking that has been a straitjacket for years puts creative options into play. And it opens the doors to double and triple dividends: changes that yield benefits on more than one front. Some of the most important economic research in recent years shows that a single intervention—a community reclamation of a brownfield or planting on degraded agriculture land—can solve three problems. It regenerates an ecosystem, provides income for the restorers, and empowers people as civic actors. In dire straits on the economic and ecological fronts, we have little choice but to find a way forward that addresses both. That's what plenitude offers.

THE ROAD AHEAD: ECONOMIC PERFORMANCE 2010–2020

A core principle of plenitude—diversifying out of the BAU economy—is predicated on a view about what the future holds. After the crash, economists put forth a wide range of predictions about the depth and length of the downturn whose only common denominator was uncertainty. The severity and uniqueness of the event led to uncharted territory, in which large-scale models, never all that accurate, were highly unreliable. Economists reverted to simplified mental schema, instinct, and estimates of probabilities. Even a year later, no one really knew whether the green shoots and early signs of growth would last after the stimulus dollars dissipated. The future may bring recovery, stagnation, or even another downturn. What I am about to say must be understood in that context.

The economy is broken in fundamental ways, as are the local and global ecosystems on which it depends. Quick fixes won't solve its problems. Creating a truly sustainable system will require ecological restoration and technological innovation over a period of many years. Plenitude is a strategy for thriving during that transition. The basic ideas of the plenitude approach were formulated during a period when the economy was expanding, but many, including me, questioned its ability to continue with business-as-usual. As a result, the plenitude logic is most apparent during rough periods for the conventional market. But even when growth resumes, the approach remains relevant. That's because it's oriented to the medium term, the next decade and beyond.

A key prediction is that the days of sky-high market returns are over. The twin bubbles in finance and housing were a mirage. We now know that many of the gains were illusory, such as, for example, billions in fictitious profits in the financial sector. Rising prices for land, housing, and other assets were propelled by unrealistic valuations. The BAU economy is in for a long slide.

The view that future returns will be lower comes in part from looking at historical data. The rate of profit for the U.S. economy from 1948 to 2005 shows that in addition to short-term ups and downs, profitability has long swings. From 1948 until 1982, the long-term trend was down. The stagflation of the 1970s led to a major restructuring that began in the early 1980s. Then profits began to rise and were on an upward trajectory until the 2008 downturn. It's likely the peak has been reached, and we're in for another decade or two of slide. There will be less income for individuals and households. Debt-fueled growth will be replaced by higher household savings, which means that fewer dollars will be available for consumption. Indeed, as is often the case, factors that led to high profits, such as the erosion of workers' earnings and the breakdown of effective regulation, resulted in vulnerabilities down the road. One doesn't have to believe we're facing a decade of stagnation to think we're headed for a less prosperous period.

The dominance of the United States globally is also on the wane, and there's nothing like a worldwide downturn to bring that reality home. For decades, the country has benefited from its special position in many ways. Americans could live beyond their means with a whopping trade deficit because others have been willing to accumulate the dollars that flow outside the nation's borders. But the economic collapse made foreign investors and central bankers nervous about all currencies, including the dollar. American workers have long enjoyed a wage gap relative to those in poorer countries; however, open markets and international competition erode wage differences. Companies have used the downturn to reduce compensation and locate even more jobs offshore.

Even when growth picks up again, there will be large sectors in permanent decline—automobiles, industrial farming, and perhaps even fossil fuels will be smaller and less profitable industries, if they're profitable at all. With a downturn this severe, there will be a protracted and difficult process of weeding out

low-performing industries, companies, and products, or what the Austrian economist Joseph Schumpeter called creative destruction. It will take time to re-create the classic conditions for prosperity, such as confidence, financial regulation, monetary stability, consumer demand, and a steady policy hand. Due to the complexity of the global economy, the challenges are far greater than we've ever faced.

As we move forward, the fatal flaw of the current growth regime—climate change and other ecological limits—will rear its ugly head. These problems have already started to affect the bottom line, reducing profits and incomes. Examples include the soaring food and energy prices of 2006 and 2007; the proliferation of extreme weather events, like droughts and floods in the southeastern United States; and agricultural losses due to disrupted ecosystems and species dieoffs. Most economic calculations on climate change deal with future costs, but in 2009, a research group released one of the first reports to detail the human and economic costs already being paid. Three hundred and fifteen thousand people are currently dying from climate-change-induced weather and other impacts each year; 325 million others are seriously affected; and the annual price tag is $125 billion, with the vast majority of financial damage occurring in wealthy countries. (The majority of deaths are in poor nations.) Hurricane Katrina alone is estimated to have cost $100 billion. These numbers are expected to rise dramatically in coming years.

Ecological devastation will not only lower the average returns available; the market will also become more volatile. The instability of climate and the running down of ecosystems are not smooth processes. Expect a rockier road.

Does it have to be this way? What about the much-vaunted ability of the market to generate productivity growth, technical change, and wealth? Technological optimists see green innovation as the platform for a new round of growth and stability.

To see how this will likely play out, we need to unpack the idea of growth. This overused term lumps together two very different dynamics, only one of which is really expansion. *Intensive growth* means using a fixed set of resources with greater efficiency. This productivity growth is rightly understood as the cornerstone of economic progress. As we begin to produce more sustainably, it'll be because we make technological and other changes that yield efficiencies in the use of natural capital. A shift to organic and local agriculture, passive solar homes, wind power, and other forms of renewable energy will result in genuine productivity increases. Other true efficiencies can be had through information technology and enhanced human capital. To the extent that this kind of growth occurs, it will indeed provide opportunity and real wealth.

But most of the time when people (and economists) use the word *growth*, they are also referring to the process of pulling in new factors of production, or what's called *extensive growth*. It is so named because it extends the scope of the market, or capitalist, sector, as it replaces public, household, or other types of production. Gross national product and other measures of output and income conflate intensive and extensive growth. But the extensive type is not really growth. It's a shift of resources from one economy to another, or the use of a non-renewable asset. Drawdowns of capital from the natural world to the market economy (e.g., felling timber, mining, overfishing, and using fossil fuels) are one example. If enough extensive growth occurs, the economies from which those resources are drawn become depleted or, if the process goes far enough, devastated. Eventually, extensive growth starts to become less profitable because the assets being used up get scarcer. It can eventually lead to blowback, which is now happening with the climate system, oceans, and forests.

While the standard account of economic development stresses factors such as human ingenuity, education, and physical capital, that view is beginning to be challenged by environmental historians and social ecologists. Some historians now argue that much of the growth of the industrial period has been of this extensive type, made possible by tapping into fossil fuel sources. We've long been aware that the industrial revolution depended on coal. What we haven't done is work through the implications of that for the post-carbon era. Bill McKibben has put the point powerfully: "Fossil fuels were a one-time gift that underwrote a one-time binge of growth."

The point is also true for other natural resources. Beginning in the sixteenth century, Europe and Asia deforested in order to grow, and resource depletion has been ongoing since then. Over the last few decades, a significant fraction of market expansion has occurred through running down ecosystems. The first national study to assess the extent of the overstatement of growth was done for the 1970s and '80s for

Indonesia and found that half its measured gross domestic product growth disappeared once timber, oil, and soil depletion was factored in. The situation is even starker in China, where torrid growth has created environmental and social havoc. Studies of environmental degradation have found that Chinese GDP was overstated by 8 to 13 percent in the 1990s and suggest the figure may have grown to as much as 25 percent now. U.S. consumption, fueled by Chinese exports, has become reliant on these drawdowns from nature. A recent estimate of the value lost on a worldwide basis to deforestation alone puts it at $2 trillion to $5 trillion a year.

For the United States, we do not yet know how large the overstatement of market growth has been in recent years. In the early 1990s, the Bureau of Economic Analysis began work on a series of environmental accounts that would allow us to answer that question. But their efforts shortly ran afoul of the coal industry and Republican opposition, and Congress forbade the bureau to continue. The restriction has only been lifted recently, so no comprehensive measures exist. One study of the U.S. electric power industry quantified "off the books" (i.e., currently unaccounted for) liabilities associated with three types of emissions (carbon dioxide, sulfur oxides, and nitrogen oxides). When these are added to official net operating after-tax profits for 2004, the industry total of $22.2 billion in earnings is converted into a net loss of $28.2 billion. Only four of the thirty-three companies included in the study remained profitable after accounting for pollutants they are releasing. Of course, electricity production has a much higher environmental impact than most activities, but reliance on artificially cheap imported fuel, chemical-intensive agriculture, and underpriced manufactured goods creates a similar gap in other sectors. As sustainability asserts itself as an imperative, we can expect to get the necessary environmental accounting.

When the faulty measurement ends, there will be another giant write-down on top of the financial balance sheet adjustments of 2008 and 2009. There are trillions in fictitious incomes and real costs that haven't been reckoned with yet. If we commit to sustainability, measured annual returns will tend to be lower, at least for the medium term. One consequence is that the business-as-usual market will be relatively disadvantaged, because it is highly resource-intensive. Many large global corporations are especially vulnerable because they are most dependent on unsustainable practices. If we don't commit to sustainability, the costs of collapsing ecosystems will accelerate, perhaps very rapidly.

Fair enough, but what about the emerging green sector? Won't it be expanding quickly in this scenario, and doesn't it provide an alternative to the diversification strategy? There's no question it's the direction we must go. It will provide real, not fictitious, opportunity. We'll be designing a whole new way to produce and consume based on ingenuity rather than on using up materials. In large part, plenitude is a way to allow individuals to participate in building this new economy. But we're in the early stages of the transition. The experience so far is that companies have been surprisingly slow to embrace sustainable production methods. And no single sector can compensate for the much larger trends from the whole economy. Green businesses will provide only a limited number of jobs, especially right now.

If you're lucky enough to land a good-paying job with a thriving green company, you may want to dive in headfirst. However, as we learned in the 1990s tech boom, there can be an ephemeral quality to a rapidly emerging sector, even for some of the highest-flying companies. In 2008 the surging renewable-energy sector ground to a halt, stymied by the credit crunch. And much of what's passing as green today is sustainable in one, rather than all, of its dimensions. Hybrid vehicles emit less carbon, but their batteries are toxic. They're better than BAU vehicles but cannot yet be produced in large quantities without negative eco-impacts. So while they're essential, today's green products and technologies are not a magic bullet.

> "The plenitude path [is] parsimonious in the use of scarce natural resources and a heavy user of what can be comparatively in surplus—time, knowledge, technology, and, as we reconstruct it, community.

And if the broader economy does recover soon, and global expansion gets back on track? Then we'll be back up against some of the factors that triggered global problems in 2007 and 2008. The prices of food and energy, which were soaring, will likely start rising again. Food (which is eaten by workers) and energy are inputs into

virtually everything that is produced. The index of primary commodities, which includes wood, metals, minerals, fuels, and other inputs, rose 23 percent per year from 2003 to 2007, with most explanations crediting strong demand. (Demand from China alone is a major contributor.) At no time in the last sixty years have commodity prices increased at this rate. Exactly how long it will take prices to escalate will depend on growth rates outside the United States, as well as the impacts of climate change. However, once they do, selling one's labor to an employer, buying food at a supermarket, taking an airline trip, purchasing services, or investing in stocks will yield less, in the form of either lower earnings and investment income or less consumer value for every dollar spent.

The bottom line is that room to maneuver is narrowing. In the BAU economy, we're faced with a choice between stagnation and low prices, or growth with high costs and mounting damages. The plenitude path transcends this dilemma. It's parsimonious in the use of scarce natural resources and a heavy user of what can be comparatively in surplus—time, knowledge, technology, and, as we reconstruct it, community.

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An Ethic of Compassionate Retreat

By PETER G. BROWN AND JEREMY J. SCHMIDT

The more the island of knowledge expands in the sea of ignorance, the larger its boundary to the unknown.
—L.S. Rodberg and V.F. Weisskopf [1]

What makes . . . the Gaia Hypothesis so inspiring? . . . the awareness of our being anchored in the earth and the universe, the awareness that we are not here alone nor for ourselves alone, but that we are an integral part of higher, mysterious entities against whom it is not advisable to blaspheme. This forgotten awareness is encoded in all religions.
— Vaclav Havel [2]

We need a fundamental shift in perspective within water management. To attain such a goal, we must reconsider how efforts in modern water management have, in general, focused on scientific and technological advances and assigned a declining importance to cosmology, religion, and ethics, areas formerly used to provide a context for the ends of human knowledge and action. A good place to start is to critically evaluate ideas in the broader Western narrative that have tended to privilege human welfare, scientific knowledge, and technological know-how. The alternate view we suggest, that of *compassionate retreat*, positions water use decisions in a different, although not wholly new narrative. In this narrative, the rightful role of humans is more modest and is mindful of two factors. The first addresses scientific uncertainties about water's role in earth systems and the potentially detrimental effects of acting on inherently limited knowledge.[3] The second enumerates humanity's duties of respect and reciprocity as an increasingly influential and potentially responsible member of Earth's living communities.

A central problem with the ethical narrative underlying much of modern water management is that policy decisions are conceived of primarily as epistemological (i.e., scientific or technological) questions whose primary focus is on how to achieve a certain view of human welfare. This underlying narrative fails to consider how beliefs about human welfare legitimate actions that impact the hydrological cycle. It also fails to consider the non-epistemological aspects of moral experience that influence our acceptance of different water use practices; some of these include issues of aesthetics, compassion, fairness, temperance, habit, and custom. As such, the criteria for right and wrong and their applications are not adequately situated in relation to either the empirical realities of the hydrological cycle or facts about moral experience and human obligations.

In questioning the basic tenets of the narrative of modern water management, we should not seek to consolidate water use decisions under a single model of decision-making, such as those management paradigms that emphasize epistemic claims over moral concerns. Rather, we should recognize that all knowledge is partial and limited, and all management actions affecting water have moral dimensions. And, as the epigraphs to this essay imply, we would suggest that effective, ethical water management systems must take

into account three things: (1) The uncertainties still rife in modern management, which reflect a very incomplete understanding of complex social and ecological systems. In fact, given our limited understanding, in some cases it might be prudent to confess ignorance. (2) A revised—though by no means new—view of the relationship between humans and the rest of life and the world. In framing this part of the argument, we are drawing on Aristotle's distinctions between scientific knowledge (epistêmê), technological know-how (technê), and practical wisdom (phronêsis). (3) How a revised perspective may help water managers to begin thinking about ethical behavior in times of crisis, and ultimately how to turn from a management perspective focused primarily on scientific and technological knowledge towards what we call "compassionate retreat." From the perspective of compassionate retreat, water management would begin by recognizing that modern societies, as the dominant ecological force in the Anthropocene, must operate in view of their potential to degrade, whether temporarily or permanently, the productive capacity of different ecosystems.[4] Within this framework, human managers would seek a relationship wherein knowledge and actions are situated within the systems they seek to manage and operate in a manner that will increase their practical wisdom as they encounter uncertainties and complexity. This approach would also require a deep respect, growing out of the recognition that human beings are part of the universe and its expression in the exuberance of life on Earth.

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SOME ETHICAL ASSUMPTIONS OF THE MODERN MANAGEMENT NARRATIVE

The past century has witnessed fierce debates over the role of philosophical and ethical values in science. In particular, there has been a fundamental questioning of the so-called deductive-nomological method, wherein particular truths are rationally inferred (often experimentally) from universal laws about the way the world works. More recently, similar debates have arisen in ethics, particularly in the model of applied ethics, wherein correct action in a particular case is, in theory, rationally deduced from general moral principles.[5] Without entering in on the details of these arguments, one development evolving from this discussion has been the reinterpretation of modern science and ethics in narrative terms. Such narratives reflect particular points of view; they are often stories of peoples that provide a way of understanding where they have come from and where they may be going, rather than objective theories regarding what they ought to do. These narratives share traits with myths and stories, such as having a beginning, a middle, and an end, the latter sometimes being foretold, such as in the apocalypse in the biblical Book of Revelation or the predictions of the Book of the Hopi. Although we seldom recognize it, from a narrative perspective, modern water management is conditioned by its own cultural story. This story grounds and defines the values that it derives for making water use decisions and provides the context for the ends toward which its policies aim.

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Modern water management arose within the context of the mainstream Western narrative, which begins with humanity as the main focus of moral concern, separate from and generally understood to be

superior to the rest of the world. From this beginning, nature has been viewed (in the main) as something to be transformed in the service of humanity, in recent centuries by using scientific knowledge and industrial technology.[6] What is especially noteworthy about these initial normative premises is that they are pre-scientific—they took on many of their main features centuries before the scientific revolutions of the last several centuries and have undergone little substantial revision in light of these monumental discoveries, such as those that have shaped our understandings of evolutionary biology. Within this old Western narrative, water's value is often tied to the type and quality of human life promoted within a culture. For instance, the essays commenting on Christianity in Peter G. Brown and Jeremy J. Schmidt, eds., *Water Ethics: Foundational Readings for Students and Professionals* emphasize that attitudes toward water are important due to the role of water in meeting obligations to fellow humans and their commitments of belief.[7] The essays that comment on Islamic and Hindu beliefs regarding water situate these beliefs within the larger cultural narratives of which these religions are a part and which influence the legitimacy of different legal or social claims to water.[8]

The scientific and technological developments of the last three centuries have used these underlying Western beliefs about the primacy of human needs and our inherent superiority over other creatures on Earth. They have advocated what have been presented as universal truths regarding the nature of our knowledge about the world and how to govern its systems. Although firmly based within a cultural narrative, a main feature of the modern approach to natural systems management has been this assumption of its universal claim to truth. For example, in the case of scientific positivism, a belief system that emerged in the late nineteenth and early twentieth centuries, narratives of any kind were proclaimed to be non-scientific, metaphysical beliefs that should be eradicated from serious management thinking. Yet the attempt to categorize them as such is itself based on the Western cultural narrative current at the time. It is important to note as well that the conceptual roots that explain the hydrological cycle in supposedly scientific terms are embedded within the eighteenth and early nineteenth century quest of "natural theology" to give a rational account of the amount and behavior of water on Earth—a window into the "mind of God."[9]

In this context, the term *natural theology* refers to an era of inquiry that sought to reconcile the emerging fields of scientific knowledge (after the Renaissance) with the Christian belief that the world was created by God. From this perspective, advances in such things as Newtonian mathematics and their ability to give a rational account of natural phenomenon were thought to confirm the general belief that the world functioned according to the dictates of a provident creator who had established the natural laws that govern the earth. Hence, to understand natural law was to understand the "mind of God." And to explain natural processes through the techniques of modern science and philosophy provided a firm foundation for knowledge and justification to have faith in reason.

From the perspective of natural theology, the main epistemological problem regarding water was the seeming excess amount of it on Earth, a point we will return to later. In fact, up until the nineteenth century the central question puzzling natural theologians was why a perfect God would have put so much water on the earth.[10] The vastness of the seas and oceans, whose saltiness rendered them less useful, combined with the fact that freshwater in rivers appeared to flow wastefully into the ocean were problematical. How were they reconcilable with the wisdom of a God for whom all things had a purpose in the divine economy of the world in the service of humanity?[11] Answering this question drove the investigations that led to the scientific account of water's behavior now referred to as the hydrological cycle. However, as the concept of the hydrological cycle matured into an accepted account of water's behavior, its origins in this specific theological and cultural narrative slowly faded from view in favor of a rational point of view grounded in empirical observation.

Despite this shift to empirical science, the values inherent in the larger theological narrative were uncritically carried over in the project of making water a "resource" that could serve the Western ideal of human welfare. For instance, a common sentiment in late nineteenth century North America was the pressing need to capture surface waters from rivers and lakes into human systems before they flowed "wastefully" out to the sea. In 1888, Major John Wesley Powell, an influential figure in North American water policy and former head of the U.S. Geological Survey, proclaimed that human diversions of water were key to the progress of Western civilization. Powell's arguments are

emblematic of how water management shifted from its beginnings in natural theology to an Enlightenment ideal of human superiority. This view assumed that human reason, judgment, and science could make wonderful and endlessly productive improvements upon water's natural dispensation.[12]

Simple models of hydrological cycles are inadequate for understanding the actual behavior of water in complex ecosystems. For example, they almost universally failed to predict the often catastrophic changes to biophysical systems that are caused by human interference in natural cycles via large dams, intensive irrigation, or changes in land cover. In 1909, with incomplete knowledge of the complex interrelationships between water and the environment, W. J. McGee declared water a natural resource that could (and should) be controlled by humans through technology, quantified through better science, and put to use for the greatest good of society.[13] Once head of the American Association for the Advancement of Science and a Secretary for the Inland Commission on U.S. Waterways, McGee's arguments found favorable hearing within the Progressive Era movement in American environmental politics.

The Progressive Era movement of the early twentieth century was, in terms of environmental issues, concerned with the degradation and exploitation of natural resources. In particular, there was concern that without strong government leadership and management, the proclivity of selfish entrepreneurs to maximize profits would leave few resources for the future. In response, progressives argued for a larger role for government in natural resource policy both from the conservationist perspective and on the basis of the "wise use" of all resources, as in the philosophy of utilitarians such as McGee.[14] The impact of declaring water a resource meant that it could be used in concert with other natural resources, such as forests, in service of the Progressive Era ideal of human progress[15]—progress, at least, as measured in the utilitarian ethic of the day. As such, water became one factor in service to political liberalism's idea of human-centered values, in which the Earth's natural systems can be integrated and managed to achieve this goal for all.

David Feldman has described in careful detail how the political economy of U.S. water resource policy throughout the twentieth century has been based on utilitarian claims.[16] Stephen Kraft has argued that these utilitarian notions are embedded in a larger narrative of utilitarian ethics received in Western legal traditions.[17] Such an ethic fit its times perfectly, in its promotion of liberal ideas that legitimated living wherever one wants, having as many children as desired, and achieving an affluent lifestyle. After World War II, these ideas were promoted on an even larger scale, under the guise of national and international "development." As part of a subsequent, broader narrative, the achievement of material wealth and increased industrial production then became part of an international, global project to alleviate poverty through increased living standards for all. The prophetic gospel of this management movement was "resource efficiency," and its goal was the harnessing of global resources entirely in the service of human production and consumption.[18] In the neoliberal version of this narrative, goods and services could be supplied at the lowest possible prices to consumers by using sufficiently liberalized or "free" markets. These markets could access free-flowing capital and operate without the tariffs and quotas that were previously seen as necessary for the protection of national interests. In partial support of this narrative, more than 45,000 large dams have been constructed to harness water for human development, changing the operation of the water cycle on a global scale.[19]

The unfettered promotion of water resource development was critically confronted at the Conference on Water in Mar Del Plata, Argentina, in 1977, a conference that marks the dawn of global water policy discourse. There, the momentum of the development project and its implicit assumptions were criticized for prioritizing normative views, those remnants of natural theology that assumed water resources were abundant.[20] In place of abundance, it was put forward that water should be conceived of as universally scarce due to its inequitable distribution in time and space. Subsequently, water scarcity provided the grounding proposition for a new global era of policy and planning.[21]Yet the axiom of scarcity was no more value-neutral than the narrative of abundance, for it assumed that water resources were inequitably distributed based on existing human populations and patterns of resource use. Hence, even though the political contests that beset modern water policy discourse are well documented, there has been common consent that some combination of science, rational planning, and technology provide the necessary keys to remedy scarcity,[22] rather than to question the location, size, or social values of

human communities or their attendant demands for water.

Since the 1970s, many authors have documented the failures of excessively rational, "command-and-control" approaches to water governance and their inability to adequately regulate or adapt to the complexity of human behavior. In this regard, the late twentieth and early twenty-first century witnessed a major shift in the water narrative towards a kind of demand management based on "full-cost pricing," or generally increasing the economic cost of water to encourage conservation—making water into a tradable commodity that is a discrete, private, and marketable good.[23] Where increases in human happiness were formerly seen as a "good" on the supply-side of water, demand-side management through pricing was promoted by authors such as Anderson and Leal as a means for making sure that water went to those who placed a high value on it, largely as a way to reduce demand through increased water use efficiency.[24]

"Pricing water is not a straightforward exercise in supply and demand. Rather, it is intrinsically tied to the regulations that govern such things as acceptable water uses and legitimate water rights. And these regulations cannot be divorced from the politics of their creation and enforcement.

In reality, complex natural systems present a direct challenge to an ethical viewpoint that rests on a single and/or inflexible principle.

Pricing water is not a straightforward exercise in supply and demand. Rather, it is intrinsically tied to the regulations that govern such things as acceptable water uses and legitimate water rights. And these regulations cannot be divorced from the politics of their creation and enforcement.[25] A pricing system without constraints opens management efforts to the danger that water—a key to the functioning and basic existence of all life on Earth—will go only to those able to pay for it. For instance, in early 2009 the government of Madagascar announced a deal with private investors from South Korea, who sought to lease half of Madagascar's arable land (1.3 million acres) for an agreed-upon sum to grow water-intensive crops that South Korea lacks the capacity to produce. This scheme clearly put too low a value on the country's land and water and brought about the fall of Madagascar's government. The deal was quashed, but it illustrates how poor systems of water pricing have the capacity to destabilize entire regions.[26] This little story also graphically illustrates that the idea of efficient prices ultimately rests on the empirically unsubstantiated conceit that the world was made for the use of humanity—even to the point of permitting certain individuals or groups to use it all. We feel it is necessary to deeply reconsider the basic assumption that, even in the distant future, scientific knowledge and technological know-how will be able to allow, or even *ought to allow*, complete human management of the hydrological cycle.

THE PROBLEM OF ETHICAL PRINCIPLES IN COMPLEX SYSTEMS

There is little doubt that, for better but more often for worse, the scale of human activity on Earth is affecting the entire hydrological cycle, from global land-cover changes to carbon emissions that alter ocean acidity and changes in rainfall patterns. Such awareness presents us with a fundamental crisis of values; that is to say, it presents us with a stark choice in the human narrative, a choice that will to some extent govern the sequence of events determining life's future on this planet. Within the current narrative, water is seen as crucial in supporting human populations, which are typically growing in both size and wealth, regardless of the most pressing needs of the natural landscapes around them. The latter are viewed as valuable only in terms of the services they provide in support the former.

In reality, complex natural systems present a direct challenge to an ethical viewpoint that rests on a single and/or inflexible principle. Devising and then acting on *any* single principle or standard (such as price) will inevitably alter the hydrological system of which the good is a part, as it legitimates some and constrains other water uses. Where such an ethic is based on deducing actions from overarching principles, such as the preeminent rights of humans or laws of supply and demand, it typically offers very little ability to respond to its own effects. This is the case because recognizing deleterious effects and responding to them would appear irrational in the context of the assumed and inflexible narrative. For example, if the good of achieving

material wealth for humans requires increased water supplies, the problems that arise as a consequence of increased water use rarely cause managers to question the overarching goal of increasing human wealth.

From humanity's perspective, so long as the actions guided by ethical systems were small in relation to the vast and complex systems of the planet, the disconnect between natural complexity and what were taken to be the universal and necessary means of rationally discharging ethical obligations may not have made much difference, or at least we were blissfully unaware of such effects. But the distance has closed between the impacts of our normative actions and the world's complex biophysical systems. This closure has revealed a suspect inference in the assumptions of the basic narrative of modern water management: that material and moral progress are of a piece.[27]

Organizing water management around a single theory of value standards will constrain future avenues for social and biological evolution and adaptation, including avenues that the managers may not have considered or may not yet know about. This is an extremely unethical and unscientific basis for any action. According to evolutionary science, it is adaptation and flexibility that have provided biological survival for all life forms. Constraining adaptation and evolution of natural systems as radically as we are already doing today will close off future survival for many complex forms of life. If we are to avoid such a path by recognizing our limited knowledge of the ecosystems and cycles on which we depend, we should consider the role of multivariate decision systems that, other things being equal, are likely to work longer because they provide more options from which to respond to the feedback of complex systems. We would do this in the complete understanding, however, that no system of human principles can be as complex as the system(s) in which they operate. So, from a decision-making perspective, purely rational and technocratic management cannot go far enough in helping us through the current water crisis. What we also need is a new narrative that positions scientific knowledge and technological know-how as part of the broader systems people seek to manage, and which include the cultural, religious, and ethical values by which the managers and users are informed.

THE AGE OF CRISES AND A NEW NARRATIVE

Our previous ethical systems have contributed to the current water crisis. Yet if we are to offer a new direction for management, we must rethink the beginning, middle, and end of our water narrative. As we noted in the introduction to this essay, Aristotle offers sound advice. In his *Nichomachean Ethics*, he distinguishes three types of knowledge.[28] The first is pure knowledge, or *epistêmê*, which is the root word for "epistemology" and the types of knowledge claimed by modern science. For Aristotle, this knowledge proceeded from necessary and universal truths about unchangeable objects (i.e., mathematical axioms or water's chemical makeup as H_2O). The second is applied knowledge, or *technê*, which is the root for "technology" and the types of knowledge employed in our productive capacity, or know-how, in reasoning out how to produce such things as a house, a hydroelectric dam, or a modern sewage treatment system. The third is practical wisdom, or *phronêsis*, which has no modern equivalent[29] but may be interpreted as a prudential type of reasoning characterized by those who are able to reason not only about what is good for them, but are also able to deliberate about what is conducive to the good life in general.[30]

For the purpose of critically engaging the ethic and narrative of modern water management,[31] it is helpful to show how its emphasis on scientific epistemology (epistêmê) and technological reasoning (technê) has excluded the virtues of practical wisdom (phronêsis) that offer a route to an improved, ethically conscious form of water management. First, where epistêmê emphasizes that scientific knowledge is often built from necessary and unchanging truths, such as the ocean's role in absorbing heat trapped by greenhouse gases and helping to moderate temperature differences on the earth, phronêsis offers the opportunity to deliberate on water's many changing relationships with other chemicals and biological organisms in complex, adaptive systems. Or again, where technê is concerned with productive knowledge—for example, improved irrigation methods or conveyance infrastructure—phronêsis is concerned with practices based on experiential wisdom. Excellent examples of this come from Paul Trawick's study of the evolution of successful principles for communal water management that have evolved in many regions of the world.[32] Another caveat about our current system is that technê takes advantage of luck, as in Canada, where relatively large stores of freshwater are dammed for large-scale electricity production based on a "myth of abundance."[33] By con-

trast, phronêsis does not depend on the serendipity of finding (or being rich enough to create) the right type of external environment conditions for achieving the good life. We can conclude that phronêsis is a type of knowledge distinguished from both scientific theory and technological production by its emphasis on the necessary flexibility required to act virtuously that, in the case of water management, means recognizing the limits imposed by being part of a complex, adaptive system.

With these distinctions in mind, it can be argued that acting ethically is not just a matter of acquiring enough knowledge to adequately solve a problem. Instead, ethical experiences are qualitative and require that we fully recognize our limited knowledge. Managing water cycles and supplies must be based on practical wisdom, which could potentially include ideas of 'full-cost accounting' or increased water efficiency, but only if these efforts were deemed prudent through reasoned debate that included much more than just economic deliberations. The notion of compassionate retreat first suggests that our actions ought to be guided by, but can never be reduced to, scientific or technological knowledge. It then implies that our attitude toward water ought to appreciate humanity's position as just one part within a very complex and interwoven set of systems. It also includes a clear acknowledgment of our relative ignorance concerning how that system evolved, how its different component parts (i.e., different species) emerged, and the full effects and implications of our interactions with it.

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A safer, more equitable, and long-lasting version of water management would require using scientific knowledge to construct a different narrative regarding how the world came to be and what place humanity holds within it relative to other forms of life. Here are some of the elements of such a narrative, presented in reference to the old one it seeks to amend:[34] First, the universe should not be viewed as having been brought into being by a Creator. Rather, the universe is itself Creative, or self-organizing in the Gaia hypothesis sense, and, by a long series of emergent steps, has given rise to extremely complex processes, such as Earth's living ecosystems and the organisms that live within them.[35]

We now know that life forms are creative influences that help construct both natural ecosystems and the Earth's vast biophysical systems, such as the atmosphere and the water cycle. Human beings would therefore not be viewed as having a qualitatively distinct status due to their creation in God's image. Rather, humans would be seen as members of natural communities that are the result of long-term emergent processes.[36] Whereas water once held primarily a human-focused, instrumental value, the new narrative would value water as essential to the flourishing of all forms of life, not just our own. Such a perspective was and remains part of many religious beliefs, especially among indigenous and traditional peoples.[37] But even within the world's dominant modern religions, water is usually held as sacred; behaving in accordance with this theological belief has been lost from modern forms of management.[38]

Under compassionate retreat, natural systems would not be considered simple mechanisms, where the consequences of intervention would always be believed to be reversible or amenable to "remediation," as they are now. Instead, natural systems such as wetlands, taiga, or coral reefs would be appreciated both for their complexity and their necessity. Science has made it abundantly clear that each system has innumerable feedback loops prone to change in which small perturbations may result in significantly different states of affairs. As Madeleine Cantin Cumyn argues that ascertaining water's value to human communities might begin by understanding that there are no real surpluses of water.[39]

Although the narrative just outlined is tentative, there are numerous authors who have been working to fill out what types of values ought to inform management decisions and to excise from them these very old cultural assumptions about human superiority or the priority of liberal, individual values. Joseph Sax, for instance, emphasizes the roots of several legal traditions in a communal right to natural resources.

Importantly, this right is not simply the aggregate of individual claims because it is not possible to trade these claims without communal effects.[40] In place of the independent, controlling shares of water awarded to individual humans, corporations, or governments in the past, Sandra Postel, Greta Gaard, and Carolyn Merchant all highlight the interdependence of human and natural systems. They argue that respect for one is intrinsically tied to respect for the other.[41] Alternative views of property and the plurality of claims to water are provided by Peter G. Brown, Rajendra Prahdhan, and Ruth Meinzen-Dick, who argue that both natural and human systems *already* have legitimate claims on water as parts of complex natural, cultural, and legal systems. And therefore, anyone making changes to the governance and management of watersheds, however well intentioned, is well advised to consider that predictive techniques such as economic forecasts are not well suited for policy-making in complex, nonlinear systems. Hence, they risk jeopardizing the survival of local systems that, at least in some cases, are working well.

While we should be careful not to read the views expressed by the other authors as automatically supporting our own—for in many cases significant differences remain—it is important to consider how a new and clearer water ethics discourse is emerging within the context of environmental ethics, environmental law, and natural resource policy. In all these disciplines, common criticisms have been made of the policies that have dominated the ethics of twentieth and early twenty-first century development. Seeing these criticisms as part of an emerging literature is, therefore, not only an observation of familial resemblance, it is a statement that the water ethics literature is assembling rungs on a ladder that should help us all to think more ethically and responsibly in the current and clearly exacerbating water crisis. From the perspective of these frameworks, there is an ethical imperative to reduce the scale and intensity of human intervention in the hydrologic cycle and to thoughtfully reverse many of the interventions that have already been made. These changes must be accompanied by fundamentally rethinking the ends toward which water management is aimed.

COLLAPSE AND THE ETHICS OF COMPASSIONATE RETREAT

According to the World Economic Forum, the world water crisis is closely interlinked with other crises facing humanity as the new millennium gets underway, including climate uncertainty, intermittent but often severe shortages of staple grains, rampant and increasing consumption of goods, political destabilization in developing countries, foreign oil dependence and energy security in Europe and North America, crises in urban water supply and sanitation, and global human health and population increases and shifts.[42] These are all examples of systems under increasing stress. We think it is important to see these interconnected phenomena as signals that fundamental rethinking of our circumstances is required—a fundamental shift in perspective and in the scale of our demands on Earth's life-support systems.

At this time in history our ethical systems face immediate and critical tests. As Falkenmark and Folke make clear, systems that are greatly disturbed may collapse or "flip" from one set of behaviors to another.[43] In the water sector, the potential for many such collapses is imminent due to the effects of climate perturbation on droughts, floods, sea level rise, aquifer depletion and contamination, ice melt, ocean acidification, and saltwater intrusion. A new ethic needs to help us prepare for the likelihood of ecological, economic, and social collapse. However, from the perspective of constructing a vitally needed new narrative, we must think critically about what such collapses portend, and about reconstruction thereafter.

Jared Diamond defines social and ecosystem collapse as a "drastic decrease in human population size and/or political/economic/social complexity over a considerable area, for an extended time."[44] The nascent literature on social responses to collapse postulates five pathways that normally occur after social or environmental collapse.[45] (1) One is where complex human and natural systems are not able to re-emerge as they once were. Remnants of previous civilizations, such as those Mayan groups whose water use rituals contributed to ecological and social collapse, exemplify a road to be avoided if possible.[46] (2) Another may be referred to as template regeneration. When the crisis is past, there is a reassertion of old ideologies and worldviews, and little is learned from the experience of collapse. A contemporary example was produced in the film *Crapshoot: The Gamble with Our Wastes*, which links contemporary sanitation problems with a failure to rethink the basic Roman assumption of mixing water with waste: namely, that once mixed, nature's processes or our technological prowess will

allow us to safely separate them later. The conclusion of this and legal work in the same vein is clear. We have repeated the Roman pattern of poor reasoning in modern sanitation and now are faced with wastewater problems at a much more vast scale.[47] (3) The opposite of regeneration is a new system that contrasts strongly with the pre-existing template or narrative—sometimes with a foreign source. An example of this is the replacement, in the United States, of the Iroquois self-understanding with the Judeo-Christian understanding of the European settlers. (4) In the fourth pathway, social or natural complexity does not re-emerge at all. After collapse the capacity of the system is too weak to support human and natural diversity, such as when floods erode topsoil and permanently curtail productivity, or fossil aquifers collapse from over-pumping and can no longer store groundwater. (5) A final option is called orthopraxy. In these cases, marginalized groups practice the orthodoxy of the dominant group but do not internalize it. For instance, Australian aboriginal groups have persisted using their own values but also argue for rights to both water and land within the system imposed by their colonizers.[48]

To the degree that we can influence the timing and nature of collapses and their aftermath, this typology provides some guidance on what to do—tempered by strong humility that our control over events is likely to be limited in many cases and nonexistent in others. For example, it is apparent that as climate changes are amplified by positive feedback loops, future generations will have no timely prospect of reversing the process. It is also obvious that they must avoid template regeneration if at all possible, since, as we have already argued, that narrative has been a major cause of our current multiple crises. Avoiding past mistakes, however, will not be enough; a water ethic must be seen as constitutive of, and complementary to, much broader social and moral obligations. In this sense, it requires carefully re-adjusting our water use patterns in a manner that honors our obligations of respect and reciprocity toward how the rest of life flourishes.

On the one hand, modern water management has not fully appreciated its roots in the broader Western narrative and has not come to terms with the ways this narrative has proven to be problematical. On the other, simple models of the hydrological cycle and attendant assumptions of either universal abundance or scarcity fail in their ability to capture natural complexity. So as a first step, water management must expand to include an ethic of virtue—where the quest is not only for improved decision-making frameworks, but is also for persons who act out of recognition that scientific and technological knowledge must be situated in relation to deliberations on ethics, fairness, temperance, and justice and which include great humility regarding the types and ends of human knowledge. *In this sense, a water ethic must be seen as moderating, rather than managing, the human–environment relationship*. We want to point out that we are arguing that any notion of including a virtue ethic for water must be situated within humanity's position as one part of many complex socio-ecological systems. With considerable foresight and drawing on one form of phronêtic wisdom, Aldo Leopold argued that as members of a complex ecological community, humans must acknowledge that ethics bear on those actions involving "deferred reactions" that have consequences not discernible to the average person.[49] This is because, within complex systems, it is not likely that we will always be able to connect or single out direct causal relationships. Like C. S. Holling and others who view the world as a complex adaptive system, we are arguing that people need to "manage" water by minimal intervention.[50] The virtue of a water ethic would therefore lie in the fact that managers and users needn't understand the complexities of water in all of its manifold processes in order to behave in a manner respectful of it. This would answer any objections that what we are suggesting would complicate water management by adding more criteria to its goals. Indeed, trying to manage in such multitudinous ways would present intractable, probably impossible levels of calculation. We are rather arguing that humanity's primary relationship with life and the world should be one of respect and reciprocity, wherein we use our existing knowledge toward ends that are conducive to a good life for the entire community of life that is dependent on water. To start with, we should not assume that natural water is in any way

"...humanity's primary relationship with life and the world should be one of respect and reciprocity, wherein we use our existing knowledge toward ends that are conducive to a good life for the entire community of life that is dependent on water.

inequitably distributed over time and space. Rather, the incongruence between supply and demand should cause us to reflect on the size and characteristics of human communities and patterns of resource use, not only on water supply.

The quadrupling of the human population and the economic expansion of several hundred percent in the twentieth century have placed a crucial choice before us: live with a denuded, simplified, dangerous, and quite possibly dying world, or embrace what we're here calling *compassionate retreat*. At this turning point, humankind is facing some of the most difficult choices of our history. There are large and often rapidly growing human populations living in areas like sub-Saharan Africa, where chronic droughts are very likely to be increased in magnitude and intensity by climate change. The same holds true for the U.S. southwest and large parts of Australia. It is growing increasingly unlikely that it will be feasible to continue to support these areas' current populations in situ. Nor is it possible to legitimately support the high-consumption societies of which the two latter places named are a part.

Compassionate retreat starts with the recognition that the size of the human population and the massive consumption already underway (and nearly universally aspired to) are not consistent with an ethic of respect and reciprocity, and especially do not accord with the human ability to understand or to manage complex systems. Rather than maintain the conceit that we can somehow get out of the problems we have created through management based only on science and technology, this new narrative proposes a form of strategic retreat similar to those used in a battle that cannot be won. It offers the option of significant reductions in the scale and escalation of our problems, which will allow us more time to assess and respond. There is, moreover, a concomitant and urgent need to think through and move toward steady-state economies, such as advocated by Peter Brown, Herman Daly, and Peter Victor.[51] Ultimately, compassionate retreat aims for an overall impact that approximates what Daly calls "the biocentric optimum"—that level of activity consistent with abundant human and non-human life and needs. Technological advances can play a major role in reducing the overall scale of the human impact, but technical advance alone is not sufficient to deal with the excessive scale of the human enterprise at this stage in history.

There are several dimensions to the *compassionate* side of this strategic retreat. The first is to recognize that modern water management has failed to appreciate and understand the influence of its roots in Western values, worldviews, and religion.[52] It should start by sharply and systematically questioning that narrative and then should take an open stance toward alternative ideas and beliefs that will have positive effects on how decisions affecting water are made. Modern science's account of the evolution of the universe offers one possible narrative, using its own version of human origins and of our collective relationship to Earth, which is fundamentally different from the older, pre-scientific Western narrative in which current water management approaches are embedded. But we can enrich our understanding of compassionate retreat from existing cultural sources as well. For instance, Chinese philosophy has a strong history of using water's behavior as the natural model—displaying humility, leadership, and perseverance—for principles from which ethical and even political obligations are derived.[53]

A second approach is to recognize that our current water use patterns, though in many cases both unsustainable and ethically indefensible, have committed us to certain obligations to human and non-human communities that now depend upon them. Solutions to longstanding problems should seek low-technology alternatives, such as solar water disinfection (SODIS), which uses the sun's ultraviolet rays to purify water, already in use purifying water for over two million people. Such non-invasive technologies represent proven ways to increase community involvement in human health and sanitation in the latitudes most affected by water-related illnesses without large changes to complex systems and in the areas of the world where drinking-water needs are the most severe.[54] Under compassionate retreat, any new water developments must be premised on the fact that the hydrological cycle is already fully in use by the world's interdependent communities, both human and non-human. And finally, there is a need to redistribute material wealth away from the excessively rich to the desperately poor, at the same time that we redesign the economies of the wealthy countries away from high consumption, gradually, so as to cushion damaging jobs while evolving good ones. This change will require new global institutions respectful of community rights to water, which have the power to severely curb and redirect the current emphasis on individual and business liberalism.[55]

What we are able to offer here is a preliminary vision of a future that is most urgently in need of construction. It is also clear that in finding a new ethic for water, we can draw on elements of humanity's shared moral and scientific heritage and reposition them within a narrative that puts science and ethics together in living within complex systems. In this sense, although we have argued here that humanity's underlying water narrative needs reconstruction, the process of creating the new one may involve reusing stones from the building that is being torn down. We are all inheritors of rich moral teachings that can be deployed as elements in a narrative and ethic that envisions and helps to bring into being a flourishing Earth.

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NOTES

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Conservation and Continuity

By CURT MEINE

This essay has been adapted from a plenary address delivered on March 24, 2010, at the 75th North American Wildlife and Natural Resources Conference in Milwaukee, Wisconsin. The first North American Wildlife Conference (as it was then called) was held in Washington, DC, in February 1936. President Franklin Roosevelt, who had issued the call for the conference, described it as "the most important conference of its kind ever assembled." It has since served as the primary annual gathering of professional wildlife managers, administrators, and policy-makers from across North America. The full text of this address will be published in 2010 in the Transactions of the conference. For more information, visit the Web site of the Wildlife Management Institute at http://www.wildlifemanagementinstitute.org. –ed.

How can we make meaningful connections among a seemingly distant past, a troubled present, and an uncertain future? That question was on my mind earlier this week when I found myself in the library at the Department of Forest and Wildlife Ecology at the University of Wisconsin in Madison. At the top of one bookshelf was a box labeled "North American Wildlife Conference Transactions, 1937–1972." I did not have time to review all the volumes, and their contents are not yet available via the Internet. (They should be.) But by chance I did pull out the *Transactions* of the 1963 conference. Toward the end of that volume is a paper entitled, "The Importance of History to Natural Resource Managers," by Charles Callison, who at the time was executive vice president of the National Audubon Society. The article begins with a lament that, in 1963, only fifteen years after Aldo Leopold died, students didn't know who he was any more. This was only a few years before Leopold's *A Sand County Almanac* was reissued in a paperback edition. That edition would itself change history.

A good portion of my own work over the years has been devoted to exploring "the importance of history to natural resource managers." Invariably, when I focus on the theme of conservation, history, and the land ethic, I return to the events of the mid-1930s. Think of the stories we have all heard and the images we have seen of the Dust Bowl. Several of the images that especially come to mind are from "Black Sunday"—April 14, 1935, almost exactly seventy-five years ago—a day remembered for one of the most terrifying dust storms of the "Dirty Thirties."

Mark the occasion. April 27, 2010 was the seventy-fifth anniversary of the legislation that created the USDA Soil Conservation Service. I hope each year we will remember and celebrate it, perhaps by giving thanks for the soil that is beneath our feet and in our bones. I regard it as one of the most important events not only in conservation history, but in all of American and human history. It was one of many critical conservation developments of those years. Others included the founding of the National Wildlife Federation, the Wilderness Society, and The Wildlife Society; the work of the Civilian Conservation Corps; and the expansion of the national wildlife refuge system. It was, in fact,

the time when the one-word term *wildlife*, as we now use it, first became widely adopted.

These innovations came in response to the devastation of the American land and the economic turmoil that was both cause and consequence of that devastation. The plowing up of the prairies and the recurring dust storms were only one expression of the crisis in conservation. It also entailed the near complete deforestation of the northern Great Lakes forest; the pollution of waterways and the disruption of watersheds across the continent; the widespread draining and ditching of wetlands; the depletion of game populations and an increasing incidence of species endangerment and even extinction; the environmental degradation in the nation's burgeoning cities; and of course, the pall of economic depression over it all. These commingled dilemmas of the 1930s brought forth what we can now recognize as dramatic change in conservation science, policy, and practice. That change is reflected in the early transactions of this conference, in a wave of new laws and policies, in the letters and articles of the times, and in the newspaper headlines of the day. Conservationists of all stripes knew in the mid-1930s that they faced an unprecedented situation and that conservation must evolve to meet the call of the times. They simply had to find new ways to think and work together to meet the multiple problems before them. There was no choice.

This response, of course, played out in many ways in many places. But to make a direct historical connection, I want to concentrate on one particular episode. Out on what we in Wisconsin fondly call our west coast, along the Mississippi River, a lovely, burbling trout stream flows amid the beautiful wooded hillsides, contoured crop fields, and rolling pastures of the Coon Valley watershed. It was not always so pleasant a picture. In the early 1930s it was a wasted watershed, vulnerable to gully-washing storms that had stripped much of the loess topsoil off its hills, deposited it thickly in the valleys, and finally lost it to the Mississippi. Leopold described Coon Valley at the time as "one of the thousand farm communities which, through the abuse of its originally rich soil, has not only filled the national dinner pail, but has created

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the Mississippi flood problem, the navigation problem, the overproduction problem, and the problem of *its own future continuity*" (emphasis added).

That last phrase, I think, is simply a more poetic way of expressing the modern concept of *sustainability*. And it was in the Coon Creek watershed that a radical new approach to living sustainably on the land unfolded. Hundreds of farmers came together with the assistance of what was then called the Soil Erosion Service (predecessor to the Soil Conservation Service and today's Natural Resources Conservation Service) to establish the nation's first watershed rehabilitation demonstration project. Leopold and other experts from the University of Wisconsin and the newly mustered city boys in the Civilian Conservation Corps joined in the effort.

Shortly thereafter, in May 1935 (again, almost exactly seventy-five years ago), Leopold published an article about the project in *American Forests* called "Coon Valley: An Adventure in Cooperative Conservation." In it Leopold sought to communicate an essential message: that to solve the problem of Coon Valley's "future continuity," the landowners and conservationists had to deal not only with the proximate symptoms of land degradation, but with ultimate causes. And to do that, they had to invent a whole new approach to conservation, one that encouraged all those involved to look beyond their own boundary lines and professional categories, to reconsider their special interest in this or that part of the land. They had to deal not only with the soils, or the water, or the pastures and crop fields, or the forests, or the wildlife, or the scenery, or the economic status and productivity of the land; they had to deal with all of them, together and simultaneously, within the entire Coon Creek watershed.

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"There are two ways to apply conservation of land," Leopold wrote in his article. "One is to superimpose a particular practice upon the preexisting system of land use without regard to how it fits or what it does to or for other interests involved. The other is to reorganize, gear up the farming, forestry, game cropping, erosion control, scenery, whatever other values may be involved so they collectively comprise a harmonious balanced system of land use. The crux of the problem is to show that integrated use is possible on private farms, that such *integration* is mutually advantageous to both the owner and the public." Leopold used that word integration several times in the article. He also used the words *community* and *cooperation*. In so using them, Leopold was not criticizing the highly individualistic Norwegian farmers of Coon Valley (whose adaptability he greatly admired). Nor was he overlooking the particular parts of the land community. Rather, he was conveying the need to make connections on the landscape so that all might flourish together, in a manner that did not undermine, but bolstered, the resilience of the land.

What do we learn from those events of seventy-five years ago? I ask because, if we are honest with ourselves, we must recognize and admit that we have been slow to learn and apply many of those lessons. Let me offer three core lessons that I, at least, have taken away from the history of "the worst hard times" (as Timothy Egan titled his recent award-winning book on the Dust Bowl).

First: the 1930s taught us in a profound way that the fate of human communities and natural communities is intimately interconnected. For those of us who work in conservation, that is basic knowledge and maybe even plain common sense. But it was not for the public then, and it is not now. It was a lesson that forever marked that generation of conservation scientists, policy-makers, educators, and practitioners. It was one, however, that would fade in and out over the decades that followed, depending on the length of time since the most recent environmental crisis pointed out its essential truth, and the speed with which that crisis faded from the headlines and into the past.

Second (and I say this with writer and farmer Wendell Berry in mind): we conservationists need to speak loudly and boldly some fundamental truths about our economic philosophy and the system of economic, educational, and policy institutions that embody that philosophy because, quite frankly, we cannot count on traditional economists to do it. Leopold, commenting on the problem of soil loss and watershed degradation early in his career, in the American southwest, wrote: "Erosion eats into our hills like

a contagion, brings down floods and the loosened soil upon our valleys like a scourge—water, soil, animals and plants—*the very fabric of prosperity*, react to destroy each other and us" (emphasis added). Later, in his essay "Wildlife in American Culture," he would distill his emerging economic wisdom into a deceptively simple sentence: "We fancy that industry supports us, forgetting what supports industry."

"On my dark days I fear that we have learned nothing from the last two years of tectonic economic change—that we are well on the way to having wasted this crisis. Worse yet, I fear that we in the conservation community have had no voice in this conversation, that we have failed to bring to the table our necessary perspective, using our generations of accumulated knowledge and wisdom.

On my dark days I fear that we have learned nothing from the last two years of tectonic economic change—that we are well on the way to having wasted this crisis. Worse yet, I fear that we in the conservation community have had no voice in this conversation, that we have failed to bring to the table our necessary perspective, using our generations of accumulated knowledge and wisdom. Up until the very brink of the recent economic near-meltdown, pronouncements came forth over the airwaves and from the highest offices in the land—and not just government or business offices—that "the fundamentals of the economy are strong." Now that we have stepped back (at least for the time being) from the brink, we are anxiously awaiting the word from our economists and from the pundits' pulpits that the fundamentals are strong again! But we conservation-minded citizens know in our bones that "the fundamentals of the economy" are not abstract numbers on the computer screens and spreadsheets of the world, not the sub-totals toted up at the end of economic formulae. These do not constitute the bottom line. The true "fundamentals of the economy"—of all human economic activity, everywhere, all the time—are in fact *the soils, the waters, the plants and animals, the atmosphere and oceans, and our fellow citizens of our communities, the nation, and planet*. It is up to us here—if we do not, *who will?*—to speak up and speak out, to point out these basic economic truths, and to challenge ourselves, our colleagues, our fellow citizens, our leaders, and especially our children to imagine and create an economy that does not exist merely to consume, but to sustain, the land; that does not deplete resources and move on, but that restores and renews healthy ecosystems and human communities; that rewards rather than penalizes stewardship and caring and conserving. That was the conservation challenge of the mid-1930s. It remains ours today, *in extremis*.

And this suggests the third lesson from the 1930s: that we cannot solve any one of our multiple conservation and environmental problems in isolation. Solutions to any one of our dilemmas must also contribute to solving all the others. That is what the watershed approach showed. Coon Valley was a troubled place, not just in terms of its soils, or waterways, or woodlands, or wildlife, or farms. It was all of those and more. In the 1930s at Coon Valley, and in a thousand other places like it, the solution required that all the conservation needs be addressed together in the same place, within the same watershed, in a coordinated and integrated manner.

Now we find ourselves again in a time of national and global economic turmoil, even as we face what we might call the Litany of Woe—the many daunting problems we face: climate change, human population growth, dwindling fossil fuel supplies, biodiversity loss, emerging diseases, declining freshwater quality and quantity, food security . . . all those dark trends that keep us up worrying late at night. We have every good reason to shudder when we look straight at the Litany of Woe and at our human prospects a generation or two out (much less seven generations). Yet we still seek simplistic solutions (think, just to choose one example, of the recent corn ethanol mania). We fail to think like conservationists: to make connections among our concerns; to support and use our best science; to weigh long-term costs and benefits; to consider ultimate causes and durable solutions; to care about our neighbors, future generations, other species, and the land as a living community. We are re-learning what our grandparents had to learn in the 1930s: the absolute necessity of coordination and integration in service of our shared interests, of pulling together toward a common cause. Our predecessors might not understand the way we talk about it today—promoting positive synergies, changing our paradigms, achieving

win-win solutions, and so on. But we face the same need. We need to design conservation policies and programs and practices so that solutions to any one problem help to solve all the other problems simultaneously. When I'm feeling really severely academic, I say it this way: *systemic problems require systemic solutions*. Wendell Berry describes it more poetically as "solving for pattern": that is, addressing each problem not in isolation, but as related expressions of troubled relationships.

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And so when the dust of the 1930s had literally settled, a new generation of conservationists had learned the hard way lessons that would be relevant to all future generations. That our human communities are fundamentally dependent on natural communities, even as both undergo constant change. That conservationists have a particular responsibility to speak this truth and to point out that our economic welfare reflects the health of the ecosphere in all of its dimensions. And that achieving sustainable relations with and within a healthy natural world requires integrated, caring responses at all levels of human society.

Looking back now across three generations and seventy-five years, why were some of these lessons remembered and others forgotten? Why and how did the emergence of modern environmentalism alter them? How have these notions fared in the never-ending whitewater churn of political change? Here I want to offer a challenge and a hope. I am often torn apart, as I suspect many of you are, by the Litany of Woe. But then I wake up another day and recognize that there is also a Litany of Hope. When we look back especially over the last twenty years, we can take some justifiable pride in how conservationists have begun to think in new, different, and utterly necessary ways, and how we have begun to act on that knowledge.

I have had occasion recently to review some of those positive developments. I have been writing a new introduction for a forthcoming new edition of my 1988 biography of Aldo Leopold. In so doing, I have been looking back over these last generation in conservation. I could honestly conclude that, however daunting our challenges have become, we have also seen essential changes in the way we think about and do conservation: the shift to landscape-scale approaches; the increased focus on working lands and private land conservation (which was sorely lacking twenty years ago); the emergence of ecological restoration and community-based conservation projects; the development of ecological economics and new ways of valuing of ecosystem services; the "greening" of religion and philosophy. We could add other trends to the list, this Litany of Hope. Whether these changes will come fast enough, and go far enough, is up to us. So let us keep in mind the words of David Orr, "Hope is a verb with its sleeves rolled up."

As we turn to the future, let us ground ourselves. Let me take you to two places in Wisconsin where I find hope as a conservationist these days. One is right back there along the Mississippi River in western Wisconsin: Coon Valley and its neighboring watersheds. If not fully healed, the land has recovered dramatically since the 1930s. You can indeed find plenty of good hunting and fishing and birding and scenery in Coon Valley. But you will also find that the hills and valleys of Wisconsin's beautiful Driftless Area have become a hotbed (literally!) for local and organic agriculture. If you examine a map of the nation's certified organic producers, you will see quite a swath across the upper Midwest, with

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Coon Valley right at the epicenter. Nearby La Crosse, Wisconsin, has hosted an annual gathering of the Midwest's organic growers every February since 1989. That first meeting drew a few dozen people. This year 3,000 people attended. In fact, it is no longer advertised as a Midwestern meeting; it has become the de facto national meeting of those exploring and inventing new ways to produce healthy food from healthy land.

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What this signifies to me as a historian of conservation is that agriculture and conservation are coming back together in a way that we have allowed to wither over the last two generations. We can see this not only in Wisconsin and the upper Midwest, but across the country in the growth of the local food movement, in the popularity of farmers' markets and community-supported agriculture, in the increased commitment to childhood health and nutrition. Food is reconnecting people from cities, suburbs, and rural communities to each other and to the land. New and creative links are being forged in ways that support local farmers, economies, and communities, public health, education, and land stewardship. Through food, we are trying—and able—to solve multiple problems simultaneously.

The second spot is up on the north side of Milwaukee, on Silver Spring Road. There you will find what from all outward appearances is an unremarkable place: the non-profit organization Growing Power. There Will Allen and his team hold forth. Last year Will was recognized with a MacArthur "Genius Award" for his innovative work in urban agriculture, reconnecting his neighbors to food and soil and water, offering basic lessons in ecology and resource stewardship to communities that had been neglected, reviving food and cooking traditions, providing fresh food in neighborhoods where fresh food is often unavailable. Will Allen is an amazing fellow. I encourage you, if you are in Milwaukee, to visit Growing Power and see what goes on there. I guarantee that you will find hope there (and, I bet, a few samples of fresh greens).

And so, on Wisconsin's rural west coast in La Crosse and Coon Valley, on our urban east coast here in Milwaukee, and in many other places in between, our land ethic is growing and changing. It is being reinvented and extended by new generations in new places. And of course, these are only two examples from here in Wisconsin; in fact, we can find them everywhere when we look. Our imperative need is to hold these places up, to make connections and common cause across the landscape with others who care about the health of the land, all its inhabitants and functions, and the well-being of its people. We may have different immediate priorities. We may come from different backgrounds. We may care about the land in different ways. But we all care, enough to act on that concern in imaginative and meaningful ways.

In 1940 Aldo Leopold observed, "Conservation viewed in its entirety is the slow and laborious unfolding of a new relationship between people and land." (I sometimes add, when I recite that sentence these days, "You know, Aldo . . . we've *got* to be a little more *fast* and laborious!") From that difficult period in our history we can take this vital lesson: that generation faced multiple crises and emerged from them with the shared commitment to the greater conservation good, to land health, and to resilient human communities. The people who organized the first North American Wildlife and Natural Resources Conference seventy-five years ago did so under dire circumstances, with social, economic, and ecological disaster playing out across the land and war clouds on the horizon. They had to confront some basic, uncomfortable truths about history and economics and about our deficient record as keepers of the land and creators of wealth.

Not all their responses were right or effective or lasting; yet among the fruits of that time was a deeper vision of humanity's role and responsibilities within the natural world. Aldo Leopold's term for that vision was "the land ethic." When in 1947 he composed the essay "The Land Ethic," he included this key passage—the most important words he ever wrote, in my view: "I have purposefully presented the land ethic as a product of social evolution, because nothing so important as an ethic is ever 'written.' . . . It evolve[s] in the minds of a thinking community." Consider exactly what Leopold was doing in that passage. Leopold, in writing "The Land Ethic," points out that an ethic can in fact never be written; that this was only his best effort to define it at the moment. He was calling upon all of us as a community to "write" the land ethic—to draw upon our diverse experiences and knowledge and tra-

ditions and wisdom to build that ethic. In other words, all of us, in effect, write the land ethic every day.

Moreover, the development of the land ethic requires a critical venue for the "thinking community" of conservationists, such as the North American Wildlife and Natural Resources Conference provides. We cannot know what our grandchildren and great-grandchildren will say about what we do now and in the years ahead. I feel pretty confident that they will take a look back and will pass some kind of judgment. Let us hope that our grandchildren are generous and forgiving. Let us also, however, work to earn their respect and gratitude by demonstrating that we are contributing to a still-evolving conservation ethic; that we can rise above our differences and circumstances and look beyond our immediate self-interest; that we responded with hope and at least some wisdom to the profound challenges and opportunities we face right now. For how we respond to those challenges will shape the way that they live and the world that they live in. Let us pause in this moment to remember the debt that we owe to our grandparents, and the effort that we owe to our grandchildren.

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Conservation and the Catholic Imagination

By MARYBETH LORBIECKI

In the 1940s, after praising the "frankness and restraint" of Aldo Leopold's essay "The Ecological Conscience," philosopher Max Otto shucked the husk of admiration to observe "I value even more a quality in your paper which I can only call *spiritual*. You have a *philosophy of wildlife management* which is itself part of a philosophy of life. . . . I wish religious people—church people, I mean—could see it to be part of religion to enlist in your cause."[1]

> "Catholics ...need to be invited to the conservation table to participate... specifically as Catholics. Presently, ecological teachings have been perceived as sideline issues rather than as core to whom Catholics are and dream themselves to be.

In our present social arena, religion and science are too often pitted against one another, like cocks spurred to fight. As citizens, we lose sight of the common natural stage we share of awe, wonder, inquiry, imagination, concern, and service. Both sides fail to tap into the energies stored in the surrounding crowds. All that results are brief bursts of applause that fade quickly away. If we want to make lasting changes in ethics and conservation to preserve the planet's abundance and livability, we need to release the cocks and bust out of the pit. We may have to lure the cocks out by learning more about them, calling them by name, and singing their songs.

In this new millennium, a Creation Care movement is breaking forth in faith communities and religious organizations around the world from the rigid boundaries of dogma and the status quo to spread inspired wings and soar on the winds of religious imagination. Aldo and Estella Leopold did this in their work to restore some degraded land near Baraboo, Wisconsin, Estella as a Catholic and Aldo as spiritual naturalist. He described their unusual family enterprise at the "Shack" land: "On this sand farm in Wisconsin, first worn out and then abandoned by our bigger-and-better society, we try to rebuild, with shovel and ax, what we are losing elsewhere. It is here that we seek—and still find—our meat from God."[2]

IDENTIFYING UNTAPPED ENERGIES

If you just look at the Christian population of the United States, you see the enormous potential for conservation care. Over 75 percent of the nation's adults self-identified as Christians in 2008, with one fourth being Catholic. At the end of 2008, the global Catholic population (Eastern and Roman) numbered approximately 1.166 billion— approximately 17 percent, or one-sixth of the world's population of 6.684 billion. Some regions are growing in Catholic numbers, as on the African continent, and others declining, as in Europe.[3] This is a valuable group to examine because historically, when the service-oriented imagina-

PRINCIPLES OF A CHRISTIAN ECOLOGICAL VISION

(BASED IN SCRIPTURE)

Christ is present in Creation and all of nature.

"And God saw that it was good": Genesis is a moral mandate to act as caretaker for God's Creation in God's image—to value as God values.

The Earth belongs to God, and we are its humble creatures and tenants, responsible to pass the land on in good or better shape than we received it and to share its abundance, caring for the poor.

Creation is based in diversity and interdependence, which must be honored and preserved according to the covenant with God and other species (this includes a respect for the Divine in all religions and cultures).

Work is an act of daily dominion/caretaking for God—co-creatorship and partnership with others, especially the poor.

Rest is mandated for proper dominion and is an ecological principle.

Wilderness is a spiritual necessity—part of the tithing of land to God and leaving places for contemplation and other species.

tion of Catholics has become engaged in a good cause, an enormous amount of work has gotten done—consider the creation of Catholic hospitals, hospices, schools for the poor, orphanages, and medical clinics that populate communities around the globe. So imagine the tipping point if even a small portion of this populace as a group could get publicly, physically, and passionately engaged in conservation works and activism.

Now more than ever, this Catholic imagination is needed, not only to renew the world through activism, but for its own survival—for the inspiration to renew the Church itself. It needs a groundswell of new directions, new energies, and new ways to show meaningful, inspiring servant leadership in the world. Catholics are an untapped alternative energy source. Presently, ecological teachings have been perceived as sideline issues rather than as core to whom Catholics are and dream themselves to be.

To involve them, the environmental movement has to understand them. Judeo-Christian thought and imagination have always seen the cradle of nature and humanity as a garden. With this centering vision, the early Christian Church and many of the "saints" who sustained it over the centuries looked upon creation, or nature, as the first book of God's Word. They experienced God's revelation in its contemplation and sought to know more about the Creator through natural scientific observation. In contemporary times, Pope John Paul II circled back to these beginnings when he observed that "Along with the revelation properly so called, contained in Sacred Scripture, there is a divine manifestation in the shining sun and in the nightfall. Nature, too, in a certain sense, is 'the book of God.'"[4]

However, over the centuries in the West, with the integration of Greco-Roman Platonic thought, the "good" became associated with ideals that do not exist in nature; goodness climbed a ladder away from creation. Later, the scientific revolution dictated that life's mysteries can be solved, and can be solved rationally. The Biblical notion of loving, God-like "dominion" or husbandry of the earth degraded into "domination"—humans creating their own values for their own reasons and living by them, "subduing" the world to fit their desires rather than abiding by and honoring the systems of the earth or of the values of the Creator ("And God said that it was good."). Thus, Christians became increasingly associated with rationalizing a domination of the earth instead of a guardianship.

However, in contemporary times, Christians, and Catholics specifically, are re-centering themselves in God's own love of Creation. John Paul II, though few realized it at the time, planted the seeds of this old-but-new Scriptural vision throughout the teachings of his papacy. He taught that all Catholics, other Christians, and citizens of the globe required an "ecological conversion." He explained:

> It is the duty of Christians and of all who look to God as the Creator to protect the environment by restoring a sense of reverence for the whole of God's creation. It is the Creator's will that man should treat nature not as a ruthless exploiter but as an intelligent and responsible administrator. . . . The protection of the environment is not only a technical question; it is also and above all an ethical issue. All have a moral duty to care for the environment, not only for their own good but also for the good of future generations.[5]

As Aldo Leopold said, "When we begin to see land as a community to which we belong, we may begin to use it with love and respect."[6]

But an ocean yawns between the spiritual and ecological wisdom in Scripture and the opinions and practices of the general Catholic clergy, religious, and communities of believers. That is because Catholics have not been fully nurtured in this aspect of their faith, nor challenged by their parishes, nor called upon by the

public. Catholics need to be invited to the conservation table to participate not just as humans and fellow planetary citizens—as many are already involved for these reasons—but also specifically as Catholics. That is what John Paul II was doing, and far beyond this, he was presenting a radical transformation of Catholics' view of themselves and their place in Creation. John Paul II tried to help people to see the connections between the physical and spiritual. As creation is all of one piece, physical laws parallel spiritual laws. That means the physical flow of energies through cosmos—which naturally incorporates life and death and recycles, reuses, regenerates, and restores—is mirrored in the spiritual principles of life and death, community sharing, mentoring, forgiveness, respect, love, and restoration in relationships.

HOW TO IGNITE THE CATHOLIC IMAGINATION FOR CONSERVATION AND CREATION CARE

To build upon this perspective and work together to renew the face of the earth, conservation-oriented scientists, philosophers, ethicists, and activists—and the environmental movement as a whole—need to recognize the synergism between the Creation Care movement and the works of earth ethicists, such as Aldo Leopold and Thomas Berry.

Thomas Berry's "New Story" for the Earth resembles in many ways the spiritual ecological teachings that Pope John Paul II highlighted:

- respect for all religions and cultures as part of the diversity of God's creation;
- the connection between nature and humans and their interdependence, or humans as part of nature;
- the shift from humans as dominators to caretakers with the Creator's dominion, acting for the Creator to protect what was proclaimed as "good";
- the necessity and dignity of work that participates in the ecology of each community;
- the connections of poverty to degradation of the environment and war to environmental destruction;
- the connections between education and leadership of women and protection of the environment and community strength;
- the importance of protecting the rights of indigenous peoples and following their model of protection of Mother Earth;
- the destructive links between greed and materialism and a culture of waste; and
- seeing the fraternity of all species (John Paul II cited St. Francis of Assisi as a model, naming him as the "Patron Saint of Ecology").

STEPS TO INCORPORATING THE RELIGIOUS SPIRITUAL IMAGINATION INTO THE CONSERVATION MOVEMENT

So how can the conservation movement work with Catholics to convert their pastoral communities to their Scriptural values when their own popes and bishops have thus far failed? The movement needs to reach out not just to Catholics, but to all religious communities, not through secular reasoning but through the windows of faith—the sacred reasoning of each specific faith tradition. Scientists and activists need to learn each religion's language, listen to its Creation Care experts and Scripture, and base a plea for allied action and imagination on these platforms. This public call from outside a religious community for it to live up to its own best inner teachings makes that community look at itself in a new way, opening it up to its inherent energies and responsibilities, and its opportunities to grow and transform. The following steps may be particularly helpful in dialogue with the Catholic community:

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Make Catholics in conservation visible, speaking out on issues by making the connection between them and faith. Have Catholic conservationists step into the limelight and speak out not just as humans and community activists, but calling themselves Catholics, and speaking to parishes and religious groups. Some Catholic orders teach Creation Care as part of their ministry, such as the Franciscans, Benedictines, and the Sisters of St. Joseph of Carondelet. But they, too, are on the sidelines.

Tell stories that dramatize the connections between people and nature: for instance, between care of the planet and care of the poor; between ecosystems and neighborhoods, ecology and economy, or places and species; between human and non-human species; and between Scripture and conservation. Though Catholic social justice teachings outline care for the earth, they come off as overly academic and political, unrelated to everyday life. But new development work, such as the Green Belt Movement, shows dramatically the connections between restoring a denuded environment and rebuilding poor communities—the Beatitudes in action. Or consider the Heifer Project, which combines education and empowering of women with micro-loans and the restoring of environments and educational opportunities for children. These are stories to tell that make the connections real.

BRIEF BIBLICAL HIGHLIGHTS OF CREATION CARE

Judeo-Christian Scripture, from Genesis and the Garden of Eden on, emphasizes that what God made in creation is good (Genesis 1). Humans, made in God's image, have been given the unique responsibility to act for God in this world—to value as God values, to love as God loves, to care as God cares ("Love others as I have loved you."). They were given the intimate and loving task of naming all the animals as their first act of caretaking.

But because of disobedience, Adam and Eve were sent from the garden. Disorder came and people were at odds with nature.

God then lovingly bound people and the animals into a covenant with the animals after the great flood, and placed the rainbow into the sky as a promise for all, linking the animals and people again (Genesis 9: 8-17). As the people survived and multiplied, they endured slavery and longed for their own lands. So God, through Moses, led them through the desert into the land of Canaan, flowing with milk and honey.

But God reminded them that they do not own the land, that they are merely God's tenants (Leviticus 25, Matt. 21:33-43). If they don't respect the earth, which was given in common to be shared, and if they don't respect his command for Sabbath to give the land and the animals and themselves periodic rest, the people shall be doomed to massive destruction (Leviticus 26, Hebrews 4:4-11).

Later, in the Christian testaments, Christ comes to renew and redeem Creation, to show people once more how to value as God values, live in ways that would bring back the harmony of the garden. Christ gives his followers examples of prayer, praying in places of solitude with nature—in the garden, by the seashore, in the wilderness, in the desert. And he reminds his followers of His Father's great care for all of creation, especially for people (Matthew 6:26-29).

St. Paul reminds followers that Christ is in all creation (Colossians 1: 15-23) and that the nearness of the end times is all the more reason to be vigilant with carrying out one's duties before Christ (Hebrews 13:11-12). 1 Corinthians 12 extols the strength of diversity and interdependence. Revelation reminds followers, "hurt not the earth, neither the seas, nor the trees," (7:3) and that those who destroy the earth, God will destroy (11:18).

Use Catholic sacramental language, family values, and the Bible to give reasons for conservation and ecological work rather than limiting the rationale to scientific reasoning or community good. Climate change activists, such as Bill McKibben and polar explorer Will Steger, are beginning to talk to faith groups, using the rationale of Biblical stories such as that of Noah's Ark or Job. The Center for Humans and Nature's Lowcountries Initiative in South Carolina is also conducting dialogues with religious communities. Obviously, this can only be done if one has a clear grounding in the Scripture and tradition oneself. But there is power here, as Martin Luther King, Jr. demonstrated in the U.S. Civil Rights Movement of the 1950s and 1960s by using the language and imagination of faith. Much of his "Letter from the Birmingham Jail" could be studied to learn his technique of crossing boundaries and using others' own heritage and experts to call forth better actions from compatriots in a common effort.

Connect care for planet to the full spectrum of all life issues. John Paul II stated his basic ecological ethic and pro-life principle: "This implies that life must be handled with care, including animal life and all of animate and inanimate nature."[7] In addition, he noted the problems of overpopulation and limited resources, and he called for responsible parenthood in terms of family size, advocating the education and leadership of women and natural family planning to slow population growth and strengthen communities. He urged moving from a culture of waste and death to a culture of life.

Refer to Catholic saints and role models throughout the ages who valued nature for the gift it is, starting with Jesus. The incarnation itself casts a new light on the significance of nature and of humankind's right relationship to it. From this perspective, creation is all the more precious and in need of contemplation and

care. Jesus is only portrayed in deep prayer in the Gospels in the desert and wilderness, by and on the lake, in the garden, and at meals with friends. He referred to how deeply his Father loved even the lilies and sparrows of the fields, and despite the taboos of his time, he spoke to and taught women and non-Jews. And Catholic tradition is rife with the many saints who saw the spirit of God in nature, such as Francis, Claire, Benedict, and Augustine. Athanasius says: "The firmament with its magnificence, its beauty, its order, is an admirable preacher of its Maker, whose eloquence fills the universe."[8]

Work with Catholics to intertwine prayer, contemplation, and enjoyment in the great outdoors in any conservation efforts to encourage the experience of God within nature. To teach and understand the sacramentality of all life, one must be willing to integrate aspects of prayer within activities indoors and out, especially the Mass. To honor creation and observe its principles and flow is not to worship it, any more than to honor saints, as Catholics do, is to adore them. It is more to admit a participation in the larger cosmos, built upon complex and integrated laws beyond limited human knowledge or control.

Inspire Catholics with hope and joy and stimulate their imaginations about service and local projects. Connect to their faith and to the Beatitudes, partnering with them to experience the connections between care for the earth and care for the people in the community, while integrating prayer and Catholic liturgical symbology into the projects. Join with them on the projects they already have at work.

Of course, such a task—to engage the Catholic populace and imagination—is far from simple. It is beset with difficulties, beginning with the present tensions and problems in hierarchical accountability and responsibility and lack of diversity within the Catholic Church itself. But perhaps if Catholics had a better sense of their own early history and ecological vision, they might be able to apply this wisdom to their present problems and structures for renewal. For Catholics to change from the inside out, they need to be educated about their Scriptural heritage and earth ethic and what it comes from—to engage, embrace, and celebrate their communal and personal imaginations so they can feel called by Christ to their own spiritual, ecological vocations, as Catholic communities and as individuals. Pope John Paul II called Catholics and all citizens of the planet to remember their original nature as creatures, and he urged fellow residents on the planet to seek out "an ecological conversion." "A radical cultural change is necessary," he wrote; "there must be a 'conversion' from the indiscriminate exploitation of [the Earth's] resources to a responsible stewardship of the goods that God gives us in creation."[9] To do this, a full reorientation toward the interconnectivity of social or life issues would be needed. John Paul II put this in more specific terms to his Plenary Council in 1999: "The question of the environment is closely related to other important social issues, insofar as the environment embraces all that surrounds us and all upon which human life depends."[10]

Leopold put it even more simply: "To change ideas about what the land is for is to change ideas about what anything is for."[11] Consequently, in the 1940s, he reminded us that "No important change in ethics was ever accomplished without an internal change in our intellectual emphasis, loyalties, affections, and convictions. The proof that conservation has not yet touched the foundations of conduct lies in the fact that philosophy and religion have not yet heard of it."[12]

In 2003, John Paul II stated a similar spiritual and moral necessity:

> A solution to ecological challenges demands more than just economic and technological proposals. It requires an inner change of heart that leads to the rejection of unsustainable patterns of consumption and production. It demands an ethical behavior that respects the principles of universal solidarity, social justice, and responsibility.[13]

With the spread of the Creation Care movement, religious people are beginning to hear of these ideas, but they need to hear much, much more. Now is the time to find ways to actively engage Catholics and the Catholic imagination, and to do the same with other Christian denominations and faith communities. As Leopold states, "We shall never achieve harmony with the land, any more than we shall achieve absolute justice or liberty for people. In these higher aspirations the important thing is not to achieve but to strive."[14]

Now is the time to utilize the bridges left by Scripture, John Paul II, and so many other Catholic leaders and saints. John Paul II himself would approve: "I hope that your discussions will bring about concrete ideas for the spread of an ecological culture. May the earth flourish again as a garden for all."[15]

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NOTES

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[2] A. Leopold, A Sand County Almanac: With Essays on Conservation from Round River (New York: Ballantine, 1970; 2nd ed. 1990), xviii.

[3] Wikipedia, "Demographics of the United States According the U.S. Census Bureau"; "Catholics By Country" taken from the 2010 Annuario Pontificio, http://en.wikipedia.org/wiki/Annuario_Pontificio (Pontifical Yearbook, http://en.wikipedia.org/wiki/Catholic_Church_by_country); "World Population of Catholics Still Rising," Catholic News Service, February 24, 2010.

[4] John Paul II, General Audience Address, August 2, 2000, available at www.vatican.va.

[5] John Paul II, Post Synod Apostolic Exhortation, "Ecclesia in Asia," 1998, available at www.vatican.va.

[6] Leopold, A Sand County Almanac, xviii.

[7] John Paul II, Address, Representatives of Science and Art, Vienna, Austria, September 13, 1983, available at www.vatican.va.

[8] John Paul II , General Audience, January 30, 2002, available at www.vatican.va.

[9] John Paul II, Angelus, November 10, 2002, available at www.vatican.va.

[10] John Paul II, Message of the Holy Father to the Members of the Pontifical Council for Justice and Peace on the Occasion of Their Plenary Assembly, November 4, 1999, available at www.vatican.va.

[11] Leopold, A Sand County Almanac, 74.

[12] Ibid., 12.

[13] John Paul II, Common Declaration on the Environment, June 10, 2002; Message of John Paul II to the Ecumenical Patriarch Batholomaios, May 27, 2003. Both available at www.vatican.va.

[14] Leopold, A Sand County Almanac, 210.

[15] John Paul II, Address, National Congress of Young Proprietor Farmers, January 9, 1988, available at www.vatican.va.

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SETTING ETHICS FREE?

By Anja Claus

Review of Mick Smith, *An Ethics of Place: Radical Ecology, Postmodernity, and Social Theory* (Albany: State University of New York Press, 2001).

Environmentalists in both the theoretical and the practical community have begun to ask fundamental questions about the ongoing failure to stop ever-worsening environmental degradation and destruction. Some turn to critiques of modernity, questioning its underlying assumptions and values. Others find themselves searching outside the familiar top-down approach—reasoning from universal principles to specific practices—to embrace a local, place-based approach. Of course, ethical principles and placed-based ethics need not be mutually exclusive. In fact, looked at with insight and creativity, these two notions can and should be woven together.

However, many in environmental ethics do not embrace a place-based approach, preferring instead to continue housing the valuing of nature within larger and distant frameworks. But I, for one, perceive the necessity of freeing ethics from the grip of powerful others—governmental institutions as well as abstract philosophical ideas. I believe it is promising to let ethics spring from the "wilds" of the local.

With this ideal in mind, one soon realizes the necessity of understanding what place is and how to comprehend ethics at the place-based, local scale. Thus questions arise as we search for more appropriate solutions within our local places, including: How do we approach concepts of relativism that come to the fore as we seek to give *place* priority in ethics? How do we understand our individual relationships with place? And how do individualistic tendencies grow to be part of a relationship based on care and respect for "non-human" others within place? Moreover, how can we conceptualize an ecological ethics that springs forth and prospers within such local places?

These are the type of questions Mick Smith addresses in *An Ethics of Place: Radical Ecology, Postmodernity, and Social Theory*. Smith's theory is based on sensitivity to locality and context of place; he favors the development of an ethics that is "an-archic," in the process of maintaining and facilitating difference in place. Of necessity, therefore, his theory is not meta-ethical but must be rooted in a kind of ethical practice—the social project of manifesting such an ethics on the ground within the local. Smith's goal is to illustrate what radical environmentalism has to offer us as we struggle to transcend our current *modus operandi*.

Smith begins by critiquing modernist paradigms. His analysis is specifically aimed at ethical theories within philosophy and social sciences that have allowed right and wrong to be determined by those removed from place—bureaucrats, governments, and the legal system—and have confined ethics to an "abstract theoretical tool for passing judgment or evaluating actions at a distance, rather than embedded in an intimate relation to relevant others" (p. 15). He also critiques environmental theories for squeezing themselves into current modernist paradigms and debates, "thus becoming eviscerated and then absorbed in more palatable frameworks with which [they have] little in common" (p. 14). Smith further illustrates the irony of environmental ethics that attempt to challenge destructive practices, while tacitly accepting the conceptual framework upon which those very practices rest: "There are serious implications for theories that attempt to define solutions to a social crisis within philosophical frameworks that arise from and whether knowingly or unconsciously may support the very society we criticize" (p. 14). These are all valid critiques of contemporary environmental thought,

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and I believe the lesson resulting from his analysis is the necessity to be highly reflexive of our thoughts and actions as we try to break free of modernity's rational box.

Smith weaves together his theory on "ethics of place" by pulling various threads from different modes of thought. He starts by offering radical environmentalism as the foundation for his theory. Within this strain of thought Smith seeks to "reconstitute our ethical relations to natural others," wanting "to produce a *sensus communis* that can be inclusive of humans and non-humans" (p. 216). Radical environmentalism also offers us space for an ethical antinomianism, a rejection of moral rules and structure in favor of moral action, where the free individual is responsible for creating his or her own space of ethical engagement with place.

Smith sees the appeal as well as the dangers of radical environmentalism. It brings with it a kind of "radical individualism that regards each of us unto ourselves; a view of liberty that easily verges on moral libertinism and a nihilistic conception of politics" (p. 21). But this seems an unavoidable direction when one starts looking to place and the bottom of bottom-up approaches. For this reason antinomianism is a concept that should be critiqued more closely as part of building new understandings of environmental theory. In chapter 7, "Thin Air and Silent Gravity: The Ecological Self and the Intangibility of the Ethical Subject," Smith confronts the problematic individualism that concepts of antinomianism pose to ideas of care for others. He addresses this tension by re-conceptualizing individualism with ideas stemming from feminist theory. Smith asks, "how can individual autonomy be squared with concerns for others?" (p. 21). Here he looks to work from Judith Butler and Luce Irigaray to develop an ecological self—a self whose process of formation depends on the "recognition of and respect for the other" (p. 7)—and then links it to an environmental ethos to "re-envisage as an expression of a heartfelt but uncodified modus vivendi" (p. 21). He also draws on Hans-Georg Gadamer's concept that "becoming part of culture, becoming cultured, always requires an understanding that can only come from being open to difference. Self formation, becoming an individual, is inextricably caught up with the recognition of a respect for different others" (p. 217). Although these conceptions are focused on the relational self, Smith sees nothing from preventing the extension to be inclusive of nature's expression. From this analysis, Smith offers us all a fuller comprehension of relational self within radical environmentalism, specifically when that relation is with "non-human others."

Toward the end of the book Smith finally presents the heart of his theory. He again relies on feminist theory to lay the groundwork of conceptualizing an ecological ethics spatially, within place. He argues for conceptualizing a "spatial metaphorics" to grasp his theory of an "ethics of place." This is the most novel part of his theory, which he has been building cautiously, brick by brick, throughout the book. I must admit that it became a bit frustrating as I read through three quarters of the book and still was not quite sure where his argument was going. It was well worth the effort, though. Aiding his spatial metaphorics, Smith expands upon feminist Luce Irigaray's work on the notion of a space where others can express their difference; a space that allows escape from the pressure of an "economy of the Same." Again Smith argues that although in most feminist theory this model does not explicitly delve into the creation of such a space for nature, it is easily extended to include it. I believe that feminism stands out as a field that environmentalism needs to embrace more actively in order to help define the ecological individual and his or her relationship

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with non-human others in all their difference.

The concept of "space" as a setting of self-realization, care, and respect for difference is linked to the concept of "place" as a domain of local, concrete natural and cultural setting. Smith maintains that realizing this ethics of "letting others be" can only be done at the scale of place. Moreover, the priority of practice over theory—action over structure—emerges here because an "ethics of place" depends on developing a practical sense of what is "significant and fitting" within one's place. This can be accomplished only through a sensitivity of the changes within one's surrounding environment requiring an openness to difference, spatially and temporally. "As is appropriate for an ethics of place, a spatial metaphorics . . . helps us get a feeling for the meaning of this ethics" (p. 218). Therefore, at a spatial level, an ethics of place that requires "letting others be" can be imagined as "*giving others room* to develop and not shaping their existence solely for our own instrumental ends" (p. 219). Thus an "ethics of place" would "not seek to colonize or appropriate nature, to reduce it into the economy of 'Same', but to sustain its excess . . . that never surfeited sea . . . of radical difference" (p. 218). He further explains: "Put more bluntly, an ethics relation entails respecting and perhaps even facilitating the ability of others to maintain their differences and create their own space for development" (p. 219). An "evil" then, according to Smith, is the obstruction of allowing others, both inside and outside the human community, the space to be.

Radical environmentalism is where Smith bases his "ethics of place." But to successfully weave in concepts of the essence of nature, he draws upon deep ecology. Smith certainly values the strides Arne Naess and deep ecology have made for arguing that "culture is not the only medium of our existence [nor] the only thing that is constitutive of [our] discourse" (p. 128). Put more plainly, "nature is never simply a social product" (p. 129). This, of course, most of us can agree on. However, Smith is critical of deep ecology for its "knee-jerk" response to relativism by avoiding the argument entirely and miring itself in replacing social laws with purely natural laws. Here the book makes a fascinating and important contribution because Smith introduces an alternative to the intrinsic/social valuing of nature debate—an alternative that pulls the residence of values from both the social and natural realm and lays them within place.

Smith is very deliberate and detailed in how he addresses the relativistic approach of constructivism. Smith's "ethics of place" holds that each place forms its own subtle differences of evaluations in its meanings, traditions, and practices and is thus based on a kind of relativism. However, this is "not a relativism where 'anything goes' and it certainly does make claims about what counts as good and evil" (p. 219). He cautiously lays out the spectrum of constructivism's ideas. As he has throughout the book, Smith gleans important insights from a particular approach without chucking the whole idea. He is able to achieve this because of the effort he makes to analyze where the ideas originate, how they compare to one another, and how they can actually be quite useful in radical ecology's search for answers. A subtle but powerful distinction he makes is that the constructivist argument should be seen as an epistemological rather than an ontological argument. Referring to the writer George Sessions, Smith says that Sessions

> is right insofar as constructivists do indeed tend to emphasize the claims-making activity itself as a locus of study, but wrong insofar as constructivists . . . are not professing to tell us the truth. . . . Sessions mistakes constructivism's methodological (and epistemological)

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> presuppositions, which regard our knowledge of reality as inherently culturally bound, with an ontological position that claims that nature in general is nothing more than a social category, that is, that the truth of nature lies in what people decide to say about it. (p. 120)

Smith's hope is that if we are much more cautious and deliberate with the topology of social constructivism, we will be able to appreciate and take advantage of its capacity to break down existing ideological frameworks and to build new, more fluid structures.

Ultimately, though, Smith wants us to look at the constructivism argument not in terms of its ontological or epistemological aspects but in a spatial context of place. He wants to develop a "spatial metaphorics" that makes us ask where the values are produced. Along the constructivist/naturalist spectrum (which includes some deep ecologists), each one has its own space where location and production of values occurs: Constructivist values reside in culture; Marxist values reside in the economy; naturalist values reside in nature. Smith concludes that the disagreement, then, is actually based on the location of values production. Therefore, Smith understands trees to have what he calls "constitutive value." This is not the same as intrinsic value, nor is it based on any use or exchange values; constitutive value is based on our relationship with nature within a particular place. "Nature's value does not reside within trees, waterfalls, badgers, or bats but are [sic] constitutive of the ethical attempt to recognize such things for what and who they are" (p. 129).

"The ability of thought to transcend the circumstances in which it finds itself, its urge to create 'other Worlds,' is surely one source of our present environmental problems. It is also the wellspring of a hope that we might overcome such problems" (p.1). Surely today we need a new theoretical story to offer us alternatives for reconstructing our moral and social principles based upon an ecological ethic (as opposed to ethics based on utilitarian and deontological ideology).

There is potentially a wide and captive audience for this new story—those interested in bringing an ecological ethics to the decision-making table and looking to place as the medium and messenger of that ethics. *An Ethics of Place* stretches across various modes of thought within philosophy and social theory, gleaning from them concepts to build an "ethics of place." It succeeds in carefully and intricately weaving together concepts from feminism, deep ecology, and post-modernism. It finally offers the reader the beginnings of a theoretical and practical approach to reconnecting moral and physical spaces through the development of relationship with nature in place. Reading this book should motivate environmentalists to further pursue feminist theories on "ethics of care" and "letting others be" and to revisit the constructivist concept of relativism as it pertains to understanding valuing nature in place. Also, coming away from this book one will be unable to stop trying to visualize this place—a place where our individual ecological ethics might develop free of modernist frameworks, and where non-human others are free to express their essential being.

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INTERPRETING THE SOCIAL MEANING OF BIOTECHNOLOGY

By Bruce Jennings

The biotechnological revolution involves the extension of human power into life—living nature at the molecular level. As its concepts and styles of thought colonize professional, therapeutic, and counseling discourse, and as it is absorbed into popular culture, biotechnology begins to shape the experience of all of us. This triggers a quest for new symbolic forms with which to make sense of—to civilize—this new human power.

The starting point for these reflections on a social and ethical response to biotechnology, biopolitics, and biopower are the following two propositions:

First, technology is not simply apparatus and instrumentality. It involves a complex structure of social organization, institutional power, and cultural meaning.

Second, the social interpretation and meaning of biotechnological innovation are often overlooked in policy analysis, but they are key to a deliberative process of social learning and adjustment, and to the normative consensus formation that will allow any regulation of biotechnology to be truly effective. Experts are trained to respond to empirically grounded assertions and linear reasoning. The cultural meaning and reception of science and technology more often take the form of a narrative and figurative mode of discourse.

The positive framing of biotechnology is nearly ubiquitous, except perhaps within the domain of reproductive medicine. And yet, an unease surrounds it; there is something uncanny about fabricating life with nearly the same facility that inorganic matter and energy are manipulated. I believe that this unease does not stem solely from the concern that biotechnology will be misused by human agents. It also grows out of the realization that institutionalized structures of power (state or corporate) have an agency of their own, so that power is not something we use or abuse, *it is something that uses—or abuses—us*. The distinction between rightful and wrongful use of this power urgently requires clarification. A global bioeconomy is being built rapidly; the normative, ethical work proceeds slowly.

So much by way of prologue. I turn now to four aspects of our cultural context that I believe have a profound effect on the reception of biotechnology.

The end of value neutrality. In the post-war period, a consensus gradually developed concerning authority, expertise, and progress in science and technology. It was a consensus centered around progressive values, economic growth, social modernization, and the betterment of life through technological advance. A new kind of cultural and political framing has emerged in recent years which is less prone to see in technology the amelioration of the human condition, and more prone to discern the development of new forms of control over individuals as material bodies—reproducing, laboring, neuro-chemically behaving bodies.

Anxiety concerning normative chaos in the external landscapes of our lives. Today the global economy is shifting perhaps as drastically as it did at the dawn of the capitalist era. It has become an enormous mechanism for churning individual lives. Marx once remarked that capitalism evaporated solid traditions and social relationships—all that is solid melts into air. Updating the simile, Zygmunt Bauman refers to the "liquid" nature of our society; everything—from electrons to day laborers—is fluid, fungible, flowing. Each of us is replaceable and displaceable. Even in the most affluent societies and the most powerful nation-states, people are being confronted with personal dislocations that challenge their sense of efficacy and control. This economic state of flux, together with a politics based on the strategic manipulation of the discourse of risk,

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are two powerful technologies of social control. Does biotechnology liberate us from this structure, or does it mesh into this brave new world all too seamlessly?

Anxiety concerning the moral disorder of the internal landscapes of our selves. Social critics are asking: Have we now created a culture of narcissism and desire so insistent that it cannot be regulated, channeled, or constrained? As this concern matures and spreads throughout the culture, it offers what may become a vivid emotional platform for respectable counter-narratives to technological boosterism; that is to say, a platform for a latter-day romanticism or a new social covenant—what Michel Serres has called a "natural contract"—for the twenty-first century.

Loss of trust. America has a public philosophy that is intellectually and morally robust, but practically stymied. It calls for the preservation of individual dignity and for equitable treatment and fair opportunity for all; it envisions governance as the working of a well-ordered, just society of free and equal persons. But there is a growing perception of a gap between these standards and the actual facts of contemporary governance, between who we believe we should be and what we actually are. Cognitive dissonance is our common lot, and suspicion and cynicism our *modus vivendi*. We oscillate between private retreat and zealous, angry public engagement. Recalling Yeats' observation is chilling in our time. I paraphrase: some of our best lack all civic conviction while many of our worst burn with passionate intensity.

To sum up, here are some of the adverse meanings that biotechnology can expect increasingly to encounter, at least in significant pockets of resistance if not in the dominant center of our society and politics:

Biotechnology is being developed and marketed by private corporations that we can no longer trust to be publicly responsible, nor even constrained by market competition. Strike one.

The biotechnology industry is being regulated by government agencies that are captured and whose ideological heart is not in the activity of regulation. Foxes are not only inside the hen house, they are managing it. Strike two.

And the consuming public has no moral compass to serve as a restraining force on biotechnology either, for they cannot say no to anything that offers them or their families health, enhancement, or longevity. Strike three.

I now turn from the more generalized and inchoate cultural background confronting biotechnology to more systematic and conceptually well-developed modes of critical response. These offer counter-narratives to biotechnology, or at any rate to some of its recent forms of self-presentation or deployment. I call these the precautionary frame, the liberal humanist frame, and the ontological frame. Stated differently, these are the argument from prudence, the argument from dignity, and the argument from nature. These modes of response have had relatively little traction in the policy debates over biotechnology regulation in the United States. (They have been more salient in discourse in the European Union.) Nonetheless, they are worthy of serious attention.

> "...there is something uncanny about fabricating life with nearly the same facility that inorganic matter and energy are manipulated.

1. *The precautionary frame, or the argument from prudence*. This framework presents an attempt to break out of the logic of cost/benefit and risk/benefit analysis that has developed in mainstream economics and policy studies for decision-making under conditions of uncertainty. This frame maintains that such mainstream analysis is biased in favor of innovation and short-term benefits, while unduly discount-

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ing long-term and emergent systemic risks. The remedy is to shift the presuppositions of justification and to make the assessment process more transparent and genuinely participatory.

2. *The liberal humanism frame, or the argument from dignity*. The focus of this frame is centered mainly on human harm and justice. Note here that "harm" is used broadly in this response frame. Like the precautionary principle, it includes biological risks and harms to functioning ecosystems, biodiversity, and human health, but it also encompasses a damage to traditionally meaningful ways of life. The justice aspects of this critique center on the problem of access to beneficial biotechnological knowledge and resources. In addition, the liberal humanist critique of biotechnology revolves around the cultural and conceptual implications of the materialism and reductionism inherent in the molecular turn of biology. Critics see the prospect that biotechnology will undermine the conceptual foundations for our very notions of the moral worth of the human individual—human dignity, equality, liberty, respect, and justice.

3. *The ontological frames, or the argument from nature*. The cultural reception of science is deeply affected by ontological orientations that pose the question of the "right relationship" between human agency and the rest of being. To answer this question, natural being (nature or the natural) must be conceptualized. In general, there are three concepts of nature that are germane to our topic. I would call these nature dead, nature transcendent, and nature alive.

Nature dead is Cartesian; natural being is material without meaning, except insofar as it serves human purpose. This is the ontological frame most often used to defend and promote advancing biotechnology and augmenting biopower. Biotechnological engineering is "natural" because nature is simply raw material to be "improved" by human intelligence in the service of human well-being.

Nature transcendent places all being in a teleological narrative, being in a becoming toward fulfillment. The norm of right relationship for humanity is to accommodate and live in accordance with that narrative. When that narrative is thought to have a transcendent author, a divine Creator, the Being of all being, this ontological frame may be said to be religious, as well as philosophical and ethical.

Nature alive is bio-centric or eco-centric. It holds that value in the world resides in the natural and biotic context of which human individuals and societies are a part. Therefore, there is a natural standard of ethical rights and duties, and the good for which ethical agency and action strive can be understood in terms of systems of interdependency, relationship, sustainability, and resilience.

Prudence, dignity, and nature. These critical frames leave us with daunting, chastening questions:

- Does biotechnology promote or impede right relationship between human beings and nature alive? Is the molecular view of life finally compatible with a ecosystemic perspective? If not, does this conflict matter, socially and culturally?
- Does biotechnology promote or impede right relationship among human beings themselves? Is it possible to embrace "life better than life," without letting "life unworthy of life" crawl in through the back door as well?

When someone looks back at our age of biotechnology, will it be unambiguous to describe it as a time of "progress" and "enlightenment"?

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THE MORAL OBLIGATIONS OF SCIENTISTS

John A. Vucetich and Michael P. Nelson

To advocate, or not to advocate? That question is one of the most basic ethical dilemmas facing environmental scientists today, and the answer can embody a scientist's relationship with society and nature.

After nearly a century of consideration, the issue of whether scientists should disseminate and explain their research, and aim to influence public policy, still fuels heated dispute. The debate in general seems at a permanent impasse. The various arguments for and against advocacy span dozens of scholarly papers. Many of those involved speak past one another, portraying recycled assertions as novel logic, often without acknowledging equally familiar counterarguments. In May 2009, the journal *Conservation Biology* published our extended treatment of the topic, "On Advocacy by Environmental Scientists: What, Whether, Why, and How." For the better part of a year, we studied dozens of papers and critiqued the strengths and weaknesses of each stance for or against advocacy. Defining advocacy as "promoting, developing, or assessing policy positions beyond merely conducting research and communicating results through primarily scientific venues," we found that most positions about advocacy boil down to just a few classes of formal arguments.

> "Although it can be challenging, we know how to handle conflicting moral commitments...

We also discovered that every argument against advocacy was found wanting. Specifically:

Advocacy could hurt the credibility of science or scientists. Long before she knew the legacy of her work, even the pioneering environmentalist and biologist Rachel Carson endured organized attempts by the chemical industry to harm her credibility. But significant and unjustified damage to one's scientific credibility appears exceptional. The risk, however, is real enough that a scientist would be wise to advocate strategically, but rare enough that a scientist is not justified in refraining from advocacy for fear of damaging his or her credibility.

Time spent on advocacy takes away from time spent on productive research. We never found a published paper expressing such a banal sentiment, but we suspect that all too often, this suspicion lurks just beneath the surface. Although it can be challenging, we know how to handle conflicting moral commitments, such as being a productive scientist and an engaged spouse—we just sometimes choose to do otherwise. The challenge of time management is not an adequate excuse.

Science and advocacy are philosophically incompatible. That premise appears in various forms. For example: "The purpose of science is to assess fundamentally objective phenomena, and because advocacy is about the assessment of normative phenomena, scientists should not be advocates." Other versions assert that advocacy differs from science because science's purpose is to remain neutral and impartial—to provide facts or information, not policy advice, and to only draw conclusions with a relatively high degree of certainty. Several dozens of papers have been written along those lines in the past two decades, and all of them mischaracterize science and fail to distinguish science from scientists. The fact that science is primarily about assessing empirical propositions does not preclude a scientist, who is also an intelligent human, from assessing normative propositions.

But the failure of these three main arguments against advocacy does not create a successful one in favor of it. That is a separate task.

A few general schools of thought support advocacy:

Science and advocacy are fundamentally similar. A popular premise is that advocacy by scientists

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is acceptable, even inevitable, because science itself is inherently value-laden. In choosing which project to pursue, which methods to employ, and how to interpret the results of research, scientists regularly make—indeed, they cannot avoid—value judgments. Although we are wise to acknowledge the value of science, we commit the fallacy of composition if we assume that policy advocacy by scientists is justified merely on that basis alone. Moreover, while advocating for the objective analysis of empirical phenomena (i.e., for science) or for clear and rational thought (i.e., for reason) is uncontroversial in all but the most extreme arenas, it is also distinct from advocating for a given policy.

Scientists are obligated to speak out against major dangers to society, like climate change. Under certain extreme circumstances, this argument goes, it is reasonable to expect scientists to be advocates. While a legitimate stance, such a justification arbitrarily limits the role of science advocacy to extreme situations. If such advocacy were justified on the basis of averting societal harms, then less pressing but still important societal concerns would also allow for advocacy by scientists.

Scientists have a moral obligation first to be good citizens, second to be good scholars, and third to be good scientists. The most powerful argument we could find in favor of advocacy holds that good citizens in democracies have a moral obligation to advocate to the best of their ability in the interest of helping society.

It is true that some tension exists between advocacy and certain aspects of science. Narrowly construed, science focuses on the assessment of empirical claims, while advocacy focuses on the assessment of policy positions that transcend only-empirical claims. And yes, being an effective advocate probably will take away from time that you might otherwise spend working in the lab, writing papers, or mentoring graduate students.

Still, the commitments to society override one's commitments to science. When scientists reject advocacy as a principle, they reject a fundamental aspect of their citizenship. Because of the nature and depth of their knowledge, they have a special responsibility. It is a perversion of democracy to muffle the voice of the most knowledgeable among us and consequently amplify the voice of those with the greatest ignorance. Silencing scientists who wish to be honest and open advocates promotes mob rule by special interests. Although some might think that scientists have inadequate breadth of knowledge to appropriately engage in advocacy—that only policy-makers and managers should enjoy such a privilege—that logic would exclude virtually every citizen from advocacy, a prospect as absurd as it is dangerous.

Surviving in today's research-industrial complex makes it easy to forget that we are scholars first and scientists second. While scientists are committed to objective empiricism, scholars are committed to the rational assessment of ideas. That commitment to rationality implies—indeed, demands—a commitment to advocacy. Broad participation by scientists in advocacy will very likely make for a messy, complicated world. That complexity is justified if the goal is the betterment of society. It is time to stop discussing whether scientists should be advocates and move on to the difficult business of learning how to do so wisely.

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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.*

Peter G. Brown and Jeremy J. Schmidt, eds., *Water ethics : foundational readings for students and professionals*. (Island Press, 2010).

Robert H. Carlson, *Biology is Technology: The Promise, Peril, and New Business of Engineering Life*. (Harvard University Press, 2010)

Eva Jablonkia and Marion J. Lamb, *Evolution in Four dimensions: Genetic, Epigenetic, Behavioral and Symbolic Variation in the History of Life*. (MIT Press, 2006).

Warwick Fox, *A Theory of General Ethics: Human Relationships, Nature, and the Built Environment*. (MIT Press, 2006).

Michel Serres, *The Natural Contract*. (University of Michigan Press, 1995).

Juliet B. Schor, *Plenitude: The New Economics of True Wealth*. (Penguin Press, 2010).

Juliet B. Schor and Betsy Taylor, eds. *Sustainable Planet: Solutions for the Twenty-first Century*. (Beacon Press, 2002).

Wendy Wheeler, *The Whole Creature: Complexity, Biosemiotics and the Evolution of Culture*. (Lawrence and Wishart, 2006).

E. O. Wilson, *The Creation: An Appeal to Save Life on Earth*. (W.W. Norton & Co., 2006).

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GAVIN VAN HORN

A WORLD MADE OF STORIES

GARY SNYDER HAD A TERSE RESPONSE to the person who asked him what to do to be a good environmentalist: "Stay put." Of course, this creed is harder to keep than ever for many people, even the bioregionally inclined. I think about the impacts of mobility, both forced and chosen, because I think often about the importance of place: how our values, our affinities, and our loyalties are interwoven with specific landscapes.

Getting my bearings is on my mind. As a necessity of my new job with the Center for Humans and Nature as the Director of Midwest Cultures of Conservation, I've (once again, though gratefully) moved to a new place. This place is not totally foreign. I know prairie. I grew up in that band of tallgrass, blackjack oaks, and walnuts that spans middle America north to south. I was too young and scientifically naïve to understand this biome ecologically, but I knew it somewhere deeper down. During my move to Chicago, I dug up an old poem that I scratched down some years ago.

I dream in prairie gold
trusted soil and muddy roads
artillery thunderstorms, and a pale sky
stretched out forever on a clothesline

Being a part of a major metropolitan area offers a different view of the skyline, of course, but Chicago—"the city of Big Shoulders"—is a landscape that carries many stories. Every morning, the Purple Line ("L") train whisks me along its tracks and deposits me near the Chicago River. Not far from where I begin my walk to work, the North Branch joins the South Branch. Opposite Merchandise Mart, on the west bank of the river, now stand some high-end condos and penthouses known as Riverbend. But other buildings, with other names that reflect the place, have preceded that one. In 1832, just a year before Chicago was incorporated as a town and the first anti-pollution ordinance was issued on the river's behalf, a simple, log-cabin watering-hole called "Wolf Point Tavern" occupied the same bank.

The name Wolf Point Tavern caught my attention. My dissertation research focused on the symbolic, cultural, and religious importance of wolves in the United States. In this city of 2.8 million, it is hard to imagine wolves roaming the banks of the river. Yet, they did, and not too long ago. The Midwest—at least, the northernmost part of Minnesota—was actually the only place gray wolves managed to maintain a presence in the continental United States following the government-sponsored eradication campaigns of the twentieth century.

Arguably more than any other species in this country, wolves—once a wilderness varmint, now a wilderness icon—dramatized a conceptual transition occurring in the twentieth and twenty-first centuries about what land was for and what our responsibilities were to this land. Animals we can't easily control raise a lot of issues, including the fundamental one of how humans are related to the rest of the natural world. Wolves challenge us to consider how much space we'll allocate to other creatures who don't often share our immediate interests. When European immigrants first crossed the Atlantic and for a long time thereafter, "the howling wilderness" was an unaccept-

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able affront to human dominance. The label "New England" tells us something about the landscape the colonists were striving to shape. Competing visions of humanity in relation to other species preceded that one and have since emerged in different forms. Perhaps by now there are a sufficient number of Americans who have "stayed put" long enough that the idea of humans as "plain members and citizens" of the natural world, as Aldo Leopold phrased it, not only makes more sense but is considered requisite to the health of our communities.

Existentialist philosophers, cribbing from Heidegger, sometimes describe the human experience as one of being *thrown into the world*. Think parachute (or emergence from the ground, if you prefer). We stand up, take a look around, get our bearings, then we set to work on the labor of ordering our environments, adjusting our outer landscapes to meet the demands of our perceived needs. Reality, of course, is not so individualistic or isolated as this metaphor would have it. We've got others helping us figure things out, communities and cultures we're "dropped" into, conceptual frameworks and social norms that provide a scaffolding for navigating our surroundings and connecting to others.

This is where our grandest stories—the way we narrate our origins and relationships to the non-human world—play an essential cultural role. Because my academic background is in religious studies and my PhD was in religion and nature, I think a good deal about how sacred narratives (and here I include cultural worldviews that function as sacred narratives) gather and bind our experiences and communities together. My research has involved teasing out the relationships between these larger stories—which sometimes go by kindred names like worldviews, myths, or cosmologies—and what people do on the ground, and more to the point, with and to the ground.

These stories may be the source of some of the most deeply rooted and deeply impacting assumptions about the world: they bind our communities together with a shared understanding of where we came from, give us a common purpose for acting, and tell us what goals we should be aiming for. Perhaps this is why American poet and political activist Muriel Rukheyser claimed, "The world is made, not of atoms, but of stories." Atoms do matter, of course. You can hardly breathe a story. But I like the thought of a world made of stories because it suggests that there is something more going on in the world than the physical collisions of various substances on the periodic table. We give matter meaning based on how we learn to perceive it. And we learn how to perceive our worlds—many times unconsciously—through valued stories.

All peoples have stories about the natural world, tested by time. People—and entire cultures—may also cling to the explanatory power of a story even when it does not directly cohere with feedback from their environment (see, for example, Jared Diamond's *Collapse*; or for the more anthropologically inclined, see Roy Rappaport's *Ecology, Meaning, and Religion*). These stories are, to use the words of philosopher Mary Midgley, "the myths we live by." But, un-

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like the books in a cardboard box in the attic or on the shelves of an office wall, these stories do not stay put. Nor are they simple, benign tales told to pass the time. They spill out onto the landscape where they *shape* and *constrain* the life histories of other species.

This is a half-truth; the flow is not unilateral. Our built and natural landscapes shape us, and therefore our stories, as well. If we are interested in the relationships between human ethics and effective conservation, we should always bear the following question in mind: How can we achieve greater fidelity between our cultural narratives and the ecological contours of the land, knowing that each depends on and shapes the other?

This is, I think, what Snyder had in mind when he declared "stay put": explore your place, learn how to listen, strengthen your relationships to the denizens of that place, build something durable and adaptable. If you do, you'll have stories worth telling, stories worth living, because they'll be part of a larger dialogue.

Easy to say, much harder and messier to do. Simple answers about how our cultural narratives and ecological realities can be better aligned are unavailable. However, let me conclude with a final, prairie-inspired thought. Conservation-minded folks are likely aware of Wes Jackson's work in Kansas. Wes is trying to selectively breed deep-rooted perennial grains. His goal is that our food mimic the prairie grasses that once held all of that rich topsoil firmly in place. Instead of the one-sided extraction, ongoing erosion, and chemical infusions characteristic of the vast majority of crops grown across America's breadbasket (now corn- and soy-baskets), Wes is aiming for something close to reciprocity. Everything is held together in its mutual relations: the soil benefits, the wildlife benefits, the grain benefits, and we benefit.

It starts with the roots. Like the prairie grasses, we are seeking viable cultural roots once again. Roots that reach deep into the earth, hold it together, and mimic what worked before in a new way and for a new time. Unlike the "waving wheat" and "the fruited plain," we have a measure of choice in this. To a certain degree, we can cultivate our own roots—as individuals, as regional communities, as cultures. We can retrace our stories, see their impacts on the landscape, and reflect on whether they are sustainable, whether our cultures are well integrated with our landscapes. With this freedom is a great responsibility: to build and nourish "cultures of conservation," which are never a given, always an ongoing achievement.

One piece of the work at the Center for Humans and Nature is an exploration of our cultural roots, making sure that we don't lose sight of them despite the current fads or fashions, or the dominant modes of discourse (for now) in policy, science, law, economics, and so forth. We explore these foundational roots because the cultures we build are only as enduring and fertile as the type of intellectual and moral soil from which they draw sustenance. Yet the Center doesn't stop its inquiry there because there is also the literal soil under our feet. Our moral "roots" must be tethered to these more literal roots, must see and cultivate the interdependencies

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between the two.

As the Wolf Point Tavern reminded its thirsty visitors, wolves were once a part of the fabric of what would become Chicago. The city seems eternal, but we're relative newcomers here, after all. There are stories in and under the concrete. How might we integrate our ways of living within this larger fabric of place? We might do well to look back at the living stories of this place, seeking to recover and to stitch our own stories into this place, and by doing so envision and express a new kind of story. A story worth telling, a story worth living—not just for us as humans, but for all the other creatures, who, given the choice, would like to "stay put."

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