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Sustainability: Myth and Reality

Kai Lee

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SUSTAINABLE USE OF THE WEST'S WATER (Natural Res. Law
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SUSTAINABILITY: MYTH AND REALITY

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SUSTAINABLE USE OF THE WEST'S WATER

Natural Resources Law Center
University of Colorado
School of Law
Boulder, Colorado

June 12-14, 1995

SUSTAINABILITY OFF THE BAT

Kai N. Lee

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You do me honor to put me first in the lineup. Here at the foot of the Colorado Rockies, now become a baseball team, I'm mindful of the duties of a leadoff batter. Get on base. Present a small target and draw a walk, or, better, hit a single. Let others do the power hitting. Here are a few swings; they are meant to start the game, not to end it — to launch debate.

I. Sustainability is a complex challenge

A. Two Columbia Rivers

B. Scale mismatches

II. Three dilemmas

A. Jurisdiction vs. bioregions

B. Control vs. democracy

C. Certainty vs. learning

III. Sustainable:development :: planning:morality

A. Prosperity, democracy, environment

B. Deep and shallow forces

C. Answers from the past, questions from the future

D. Earth at night; sustainability is a direction

SUSTAINABILITY OFF THE BAT*

Kai N. Lee[†]

You do me honor to put me first in the lineup. We meet at the foot of the Colorado Rockies, hailed as a natural wonder and national treasure a century ago. Today the Colorado Rockies have become a baseball franchise too, a team of professionals playing a game invented in a pasture. Thus do humans transform landscapes.

I'm mindful of the duties of a leadoff batter. Get on base. Present a small target and draw a walk, or, better, hit a single. Let others do the power hitting. Here are a few swings; they are meant to start the game, not to end it — to launch debate about sustainable use and how we might find it.

[slide: California in Context]

We meet at the foot of the Rockies, in the heart of a region once called the Great American Desert. The Front Range outside the door here marks the western boundary of the plains; I was admiring your up-tipped planes of stone this morning, standing like sailboats in harbor on the edge of the grassy oceans to the east. The Front Range is also the eastern boundary of the North American cordillera that wrings moisture from the Pacific's clouds. By the time the air gets here it is pretty dry. That is the geographic fact that the wonderful writer and historian Wallace Stegner defined *Beyond the Hundredth Meridian*. The slide shows in green the areas of the West where annual average rainfall exceeds 24 inches per year; you'll see that most of the West is drier than that. The figure is important because European agriculture, which was introduced to the eastern part of North America four centuries ago, was developed in and

* Opening lecture, Sustainable Use of the West's Waters, Natural Resources Law Center, University of Colorado, Boulder, June 12-14, 1995.

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tailored for climates with about that much rainfall. Aridity, as Stegner and other scholars have described, defines the American West.

I. Sustainability is a complex challenge

The assignment set for me by David Getches was "sustainability — myth and reality." A better distinction might be, sustainability — myth and history, as I'll explain briefly.

[overhead: Sustainability/Commons]

Let me summarize my argument. What is sustainable use? It is use of natural resources that meets the needs of humans today while enabling humans in the future to meet their needs. That is the canonical statement used by the United Nations to define sustainable development. Note that the definition is anchored in *human* needs, not the preservation or even conservation of nature. When technology substitutes for a natural resource, as steam displaced sail in powering ships, things change. Steam power drastically diminished the need for tall straight trees. Whether tall straight trees then increase in number because they aren't being cut, or decrease in number because they aren't being planted does not matter, in this way of thinking about sustainability.

Why is sustainable use hard? The short answer is, the tragedy of the commons. That is, the problem that the pursuit of individual wants may not serve the community's needs. Reconciling the two is a fundamental question in law, as the current dispute over property rights and regulation reminds us.

Sustainability is simply described but a complex matter in practice. Let me make that point with a concrete illustration.

A. *The Unsustainable Columbia*

[slide: Columbia River vista]

Consider the principal uses of the Columbia River, a western waterway whose sustainability as habitat for salmon is severely tested today. John Volkman will say a good deal more about both the Columbia and salmon tomorrow morning, and I look forward to learning from him.

Rising in the Canadian Rocky Mountains and flowing 1,200 miles through the Pacific Northwest, the Columbia is the fourth largest river in North America.

[slide: outline of France on PNW]

It drains an area that includes parts of seven U.S. states and two Canadian provinces — as large in extent as France. The river's average annual streamflow of 141 million acre-feet is more than 10 times that of the Colorado.

[slide: jumping salmon]

The Columbia was an excellent place for Pacific salmon. Five species of *Oncorhynchus*, the hooked-nose fish, ranged most of the length and all the breadth of this ecosystem, and supported a human economy.

[slide: Indians with nets]

The first Columbia basin civilization took root in wilderness. Before its settlement by Caucasians, the Columbia's salmon nourished a population of approximately 50,000 Native Americans, whose world revolved around the yearly migrations that brought 10 to 16 million salmon back to the river. Harvested by spear, net, and boat, these fish provided both food and trade goods for the people of the river basin. The peoples of the Pacific Northwest did not grow crops, even though they could have done so. Their harvest swam in each year, worshipped but not cultivated. The Indian tribes lived in a long-run ecological equilibrium, which fluctuated between bad times and good, but endured over many human generations. Theirs was sustainable use.

[slide: salmon troller]

Today, the fishery that nurtured the wilderness is nearly extinct, the victim of a host of problems. One of them is overfishing, a plague that has claimed as victims ocean, freshwater, and coastal fisheries all over the world. But in the Columbia, harvest has been the least of the salmon's troubles. The larger problem is modernity.

[slide: McNary Dam spill]

In 1941 a young folk singer in Portland wrote a song for the new Bonneville Power Administration, the government agency that had begun to sell power from the dams completed that same year. "Roll along Columbia," Woody Guthrie wrote, "you can ramble to the sea, But river, while you ramble, you can do some work for me." He was celebrating the second Columbia basin civilization.

[slide: transmission lines]

The basin's 19 major dams, together with more than five dozen smaller hydro projects, today constitute the world's largest hydroelectric power system. The Columbia River and its tributaries generate on average about 12,000 megawatts from falling water, somewhat more power than is used in New York City.

Largely built by the U.S. government at a time of low labor costs, the dams fostered economic growth in the Pacific Northwest with cheap electricity.

[slide: aluminum smelter pour]

Industrial and agricultural development have built the population centers of the Northwest. Aluminum for soda pop cans and Boeing airliners comes from Northwest smelters powered by hydropower. So too McDonald's French fries, processed in the potato country of Idaho, plywood and computer chips from Oregon, 2x4s from the sawmills of Montana, grocery bags and computer

software from Washington — these are all products and jobs dependent on the river's electricity.

[slide: Portland]

The 50,000 Indians who lived in wilderness have given way to a population of 10 million, more than 100 times the aboriginal level.

[slide: irrigation sprinkler]

That increase in population, by two orders of magnitude, reflects a fundamental change in the relationships between people and the environment. The domesticated river provides power and irrigation while controlling its once-destructive floods;

[slide: Columbia tug]

serving as an inland waterway navigable by tug and barge for 500 miles from the river's mouth all the way to Lewiston in central Idaho; and affording world-class windsurfing in the Columbia Gorge.

The industrial Columbia is a multiple-purpose marvel, a river, as the historian Donald Worster put it, that died and was reborn as money.

[slide: Bonneville Dam]

The governing principle behind the many uses of the river has been to maximize economic return. The river's uses were ranked accordingly: power, then urban and industrial uses, agriculture, flood control, navigation, recreation, and finally fish and wildlife.

[slide: Vernita Bar]

What economic development meant for salmon was that the river no longer flowed in its natural fashion. Instead, the spring floods that came each year when the snow melts have been impounded by dams. Those waters had been used by juvenile salmon to migrate to the sea. By the late 1970s there was only one reach of the Columbia where salmon still spawned naturally, here at a

lonely spot in eastern Washington state called Vernita Bar. The annual fish runs of 10 to 16 million that fed the wilderness had dwindled to 2.5 million, and more than two thirds of those fish were born in hatcheries, because their natural habitat had been so drastically altered.

[slide: Yakima gravels]

The appetites of economic growth will in time reach the limits of the natural world to support them. In the Pacific Northwest, the limits have been measured by fish and electricity, each an emblem of its age. Salmon, ranging the length of the river since time immemorial, gauge the health of the ecosystem. Their decline has been a slow crisis by human calendars. The biological depletions have been hidden and deferred as harvest was forcibly shifted from Indians to commercial fleets and from natural habitat to hatcheries. The power system, the symbol of modernity, is now fully developed. More useful energy — quite a lot more — is coming from more efficient use, from energy efficient practices and technologies. Yet the real significance of energy efficiency is far broader: it is that the industrial era on the Columbia has come to an end, though no one can yet say what has succeeded it.

What has come instead is a prolonged period of conflict and uncertainty. Beginning in 1990, petitions have been filed under the Endangered Species Act, and the federal government has taken increasingly stringent protective measures on behalf of the salmon populations found to be threatened or endangered. It has become increasingly clear that many who earn their livelihood from the rural economies of the Pacific Northwest — ranching, farming, logging, and mining — face serious economic constraints on their uses of water and streams because of the regulations required to protect the fish. As for the fishing industry, much of the salmon fishery has been closed down, because many of the fish populations are no longer able to withstand harvest.

[slides off]

In sum, in the Columbia sustainability is a contemporary myth but a historical reality. The Native American civilization was sustainable. The present-day Columbia is not. We have succeeded brilliantly in increasing the river's economic value, harvesting enough for human numbers to increase more than 100-fold from the time of the Native Americans. Yet we have done so in a way that cannot be continued without technical means that deplete and deprive. The resistance of Oregon ranchers to demands that they conserve streams for salmon habitat is a sign of that deprivation. So is the assertiveness of the Makah tribe of northwest Washington, who propose to exercise their treaty right to harvest whales, now that the salmon have dwindled. Sustainable use is a puzzle. Meeting the needs of today forces bitter choices: to undermine the capability of people to meet their needs in the future, or to dispossess some who have earned their living from the land for generations. Does the puzzle of sustainability have a solutions? We are trying to find them. Let me explore one strategy, searching for helpful concepts. Oddly, perhaps hopefully for an academic, we live in a time where ideas are of uncommon significance.

B. Scale mismatches

The problem of sustainable use, as I mentioned at the outset, is rooted in the tragedy of the commons.

[overhead: scale mismatches]

In Garrett Hardin's classic exposition, a shepherd keeps his flock on the common pasture shared by the community. To the herder, each additional animal in *his* flock earns one unit of return. To the community, each additional animal beyond the sustainable limit of the pasture decreases its carrying capacity. But that loss, being shared among all the flocks, is borne only fractionally by the herder. The result, Hardin argued, was a tragedy, a set of

forces that drives each shepherd to increase his herd beyond the limits of the pasture, until the land is ruined. What is tragic here is that the problem results from *rational* behavior by the individual. For if one shepherd refrains from overexploiting, that makes no difference; others will reap the short-term gain, and the virtuous shepherd is ruined together with the community anyway. In modern terms, this is the problem of driving. If you drive to Denver, you will make the air over the city dirtier and the freeways more crowded. If you do not drive, you suffer the loss of mobility, but the air and roads are not perceptibly improved. Result: all drive.

SCALE MISMATCH	CHARACTERISTIC PROBLEM	SOLUTION STRATEGIES
Spatial	Pollution, e.g., release of combustion products into air.	Regulation; rights traded in markets; incentives to internalize; moral suasion and marketing.
Functional	Deadlock, e.g., misallocation of water.	Comprehensive control; planning and negotiation.
Temporal	Unsustainable harvest, e.g., catch in excess of reproduction rates.	"Preservation"; unintended shifts in social discount rates; stewardship.

Scale mismatches.

Note, however, that another name for "tragedy" is "institution." It is the rules and rights of property that propel the behavior Hardin described. I want to come back to this point shortly.

But first, I want to observe that this dynamic can be generalized, as shown in this overhead. What I suggest here that the motive force can be understood as mismatches of scale. That is, when the scale of natural rhythms does not match the scale of human responsibilities, unsustainable use results.

Hardin described a spatial scale mismatch. The pasture belongs to all, but the herder benefits from that fraction of the pasture that his flock uses. As I

suggested with the example of driving, spatial mismatches are often found in pollution problems.

This conference is concerned substantively with a functional mismatch: water in the West is a multiple-purpose resource, but it is allocated as if it were a resource that could be used well by individuals, each pursuing only one purpose.

And the problem of overfishing that I discussed earlier is an example of a temporal mismatch — taking more than the natural system can produce, so that the population is depleted.

As I've noted in the right-hand column, society has devised, over time, various institutional remedies for each of these scale mismatches. The problem of the pasture is hardly a new one, after all. If it were an ineluctable tragedy that Hardin described, the civilizations that grew from herding bands would never have arisen, and John Muir would not have spent that first summer in the Sierras where he found the voice we call environmentalism. For want of time now, I shall leave my cryptic words in that right-hand column — to discuss later if you wish.

The point I want to emphasize is the idea of scale mismatch. When human responsibilities do not accord with the scale of natural phenomena, the use of natural resources tends to be unsustainable. That is because people *acting responsibly* cannot readily find the path of sustainable use, because the signals sent by the natural world are not readily assimilated into human decision making. This is one way to describe what an environmental problem is.

II. Three dilemmas

If scales don't match, they should be fixed. Just as economists say that the problem of environment and government services is to get the prices right, so

this analysis would seem to say, get the scales right. Unfortunately, social dilemmas stand in the way of that conceptually clean solution.

A. Jurisdiction vs. bioregions

The first dilemma is spatial. Here is a map from a recent study by the U.S. Forest Service, part of its effort to save the Northern spotted owl.

[overhead: watersheds]

The map shows the key watersheds that need to be protected in order to preserve endangered species within the geographic range of the spotted owl.

[overhead: jurisdictions]

Here is a map of the same geographic area, from the same report, showing the lines that divide counties, the principal level of local government in rural areas.

The lesson is plain. Nature draws boundaries with topography and gravity; people draw them with rulers. When humans do use a natural feature to define a border it is usually a stream. But a stream is not the edge of an ecosystem; it is its center. So dividing human responsibilities along streams thwarts and undermines the interdependencies of natural populations. The result is that human jurisdictions and natural domains rarely overlap; as a consequence environmental governance is much more complicated, and therefore weaker, than biological reasoning might suggest.

Trying to match the scale of human effect to the scale of natural response is the idea called bioregionalism — to bring property claims into alignment with ecological boundaries. The trouble, as illustrated by the maps I've just shown you, is that the property lines have long been settled, and they are in the wrong places. This is one measure of the work that lies ahead of us: to clean the stain of environmental damage as it crosses the mosaic of property lines and jurisdictions. It will be hard work.

[overhead off]

B. Control vs. co-management

A second dilemma lies in governance. Trying to make economically significant changes in a territory the size of France will encounter conflict. This is obvious. Humans loom so large on the landscape that we cannot ignore our economic presence.

For that reason, pragmatic politics is unavoidable in searching for sustainable combinations of economic prosperity and environmental quality. Pragmatic politics may lead to substantial change. That is the lesson of environmental policy over the past generation. Tremendous change has come about within the normal processes of electoral and administrative politics. The creation of environmental law is a monument to that change; this center is a monument to that change.

A promising path toward pragmatism is called cooperative management: bringing together stakeholders to find solutions that all can abide and whose implementation all can contribute to.

Natural resource decisions tend to involve many different *kinds* of interests — environmental interest groups whose priorities lie with nature share the table with economic actors for whom jobs and profits are the measure of human interests. Generally, all these parties possess some kind of power — each controls the outcome in part, but none can act for long ignoring the others. It is in such circumstances that cooperative management is needed: not because cooperation is desirable, but because it is necessary.

The dilemma, as with bioregionalism, is that established patterns of governance are deeply rooted, often with social and political bases that reinforce the way formal authority is allocated. The intellectual leadership of this institute, which contributed so much to the hopeful early days of Bruce Babbitt's tenure at

the Department of the Interior, has learned with the rest of the nation how stubbornly implanted are the ways of unsustainable tradition.

C. Certainty vs. learning

A third dilemma is that we do not know enough to manage in the ordinary sense. To harvest from nature one needs to know how to exploit it, but one does not need to understand much about the ecosystem. Catching fish is not easy. But rebuilding a sustainable fishery means much more. It means having to figure out how to spawn, migrate, and grow fish, in a river and ocean environment that people affect but do not control.

All policies that aim at changing an ecosystem for human purposes are inherently experimental; that is what a generation of tree-farming, fish hatcheries, irrigation, and pesticides has taught us — moving from the farm plot or pond to the natural scales of watershed or estuary or ocean brings surprises.

Even when we are eager to learn, we must face the fact that nature yields her information slowly and reluctantly. The natural world does not have generally accepted accounting practices or quarterly reports to shareholders. On the contrary, many measures of ecological performance, like the size of a fish run or the volume of runoff in a river, come at the rate of one data point per year. We have trouble seeing economic recessions coming, and they show up in two calendar quarters; the decline of a grassland may take decades to become visible. By then, damage may be far advanced.

Worse still, we have pushed natural systems far from their natural state. Roughly two thirds of the salmon in the Columbia begin their lives in hatcheries. More than a third of the salmon's gene pool is gone, lost with stocks driven extinct when the dams closed off their spawning grounds. Ecological theory seeks to describe undisturbed ecosystems, not ones radically changed by

human intervention. The naturalist Aldo Leopold wrote that the first principle of intelligent tinkering is to save all the parts. Humans exploiting the Columbia have not done so, and that makes it harder to fashion a functioning whole from what is left.

The point is a more general one: environmental policy is nearly always clouded by uncertainty. That means that the purpose of policy should *always* be to learn from the changes we impose on nature. This is the approach called adaptive management: to think of policies as hypotheses — statements of how we think the world will respond when actions are taken or rules are changed.

Adaptive management is easy to describe because its logic is rational. It is far from easily adopted or carried out — in part because surprise is usually thought of as failure in the world of practical affairs. That perception is often wrong when what is being managed is part of the natural world, but this is something most systems of organizational or political accountability do not recognize yet. Ways to initiate, nurture, and persevere with adaptive management are urgently needed, because the experimental strategy can be both faster and less costly than trial and error learning, the usual alternative.

D. Common property and place

These three dilemmas measure in rough fashion the terrain that must be traversed from the unsustainable present to a future where we have the social infrastructure to pursue sustainable policies. This journey is one that Charles Wilkinson called *Crossing the Next Meridian*, the title of a significant and moving book about the future of the West. Wilkinson's work is founded on what he called "an ethic of place," a way to ground the ecological economics of Garrett Hardin in the human history and traditions of particular landscapes. I'd like to put

the dilemmas of scale mismatch into the context that Wilkinson outlined, together with some related work by the political scientist Elinor Ostrom.

[overhead: CPR/place]

**COMMON-PROPERTY
GOVERNANCE (Ostrom)**

**ETHIC OF PLACE
(Wilkinson)**

DILEMMAS

clear communal rights relative autonomy supportive institutional hierarchy	respect integrity of landscape treat the environment and its people as equals	Jurisdictions vs. Bioregions
cause and effect understood by all effective monitoring graduated sanctions low-cost conflict resolution	seek a sustainable, modest economy	Certainty vs. Learning
affected individuals can participate	respect & conserve regional subcultures	Control vs. Co-Management

sources: Ostrom, Elinor 1990. *Governing the Commons. The evolution of institutions for collective action.* Cambridge: Cambridge University Press. Chap. 4.

Wilkinson, Charles F. 1988. Law and the American West: The search for an ethic of place. 59 UNIV. OF COLO. LAW REVIEW 401-25.

I mentioned earlier that if the tragedy of the commons were really an implacable part of the human condition, we should not be here today, enjoying enough material surplus to permit a group to ponder these mysteries. Elinor Ostrom set out 30 years ago to understand how people manage commons, how they evade or avoid the tragedy. Her work, synthesized and summarized in 1990 in an important book entitled *Governing the Commons*, identified eight "design principles," as she called them, that seem in aggregate to provide for orderly management of common-pool resources. I have not the time now to specify

these design principles in detail, although I should urge all who are concerned about sustainability to engage with Ostrom's careful analysis.

I've listed the design principles schematically here, and grouped them so as to bring out the thematic kinship they have with Charles Wilkinson's discussion of the ethic of place. And, in turn, I want to link these two distinct bodies of thought to the three dilemmas I outlined above.

Wilkinson roots the ethic of place in two constitutive principles, the integrity of the landscape and the duty of humans to manage the land with responsibility. That's an American constitutionalist talking. To Ostrom, whose historical and anthropological studies reached from 13th century Switzerland to contemporary Sri Lanka and Spain and the Los Angeles basin, the question of bioregions is to be defined sociologically, around the communal ownership that is the prerequisite for stewardship. The other prerequisites, she argued, are enough autonomy that the community's objectives aren't foreclosed by higher, distant authority, together with a supportive institutional structure that can help when outside support is needed. Together, Ostrom and Wilkinson flesh out the tension between social space — what I called jurisdiction — and ecological space — bioregion.

The ethic of place adopts an economic principle: a sustainable, modest level of living. The model, in a way, is the aboriginal equilibrium of the Native Americans and salmon. For this to be possible, according to Ostrom, there must be an administrative mechanism — shared understanding of how things work, effective monitoring so that violators can be caught, graduated sanctions so that they can be brought back into the fold, and low-cost conflict resolution to make deviance correctable. These modernist, social science terms conjure up visions of bureaucrats in green uniforms. But in Ostrom's array of case studies, these

underpinnings of sustainable economies are often clothed in the vestments of religion and tradition, and don't look "modern" at all.

Finally, sustainability seems likely to work only where there is some sort of democracy, where all those who affect the resource have a stake in jointly managing it well.

What is important to recognize here is not only that these discussions contain important similarities, but that they differ as well. Ostrom's studies range widely through history and culture; the ethic of place is by design limited to the American West. All the cases Ostrom analyzes are small and contained, and in none of the cases of success is there significant trade in the common-pool resource with markets outside. What theorists call the commodification of the environment — taking the products of nature for the primary purpose of selling them in a market that reaches beyond the ecosystem of origin — does not occur in Ostrom's data set.

Neither does it play more than an implicit role in Wilkinson's ethic. It's there, in his admiration for traditional forms of earning a livelihood from the land. But the impact of economics, he argues, can be restrained by a sense of modesty and community. Charles lives in Boulder so he has seen how untrammelled accumulation operates, of course. His point is that we may be able to build a community in the West where cut-and-run is held to be so unacceptable that it will not often happen.

That's an admirable goal. I want only to observe that constructing the social wherewithal to reach it will take a great deal of work. In fact, it's work that is summarized by the dilemmas I have discussed. My assertion, accordingly, is that sustainability is a myth in the contemporary economy, that to make it a reality will require the reconstruction of social institutions, and that those institutions must achieve a reconciliation of human responsibilities and natural

scales. Three ways of pursuing those aims are embodied in the words bioregion, cooperation, and adaptive management. Each of these words can be, and has been, cheapened into a slogan — mere labels for politically convenient poses adopted by ambitious bureaucrats and politicians. But the ideas, as opposed to the labels, are at work nonetheless, with hopeful signs, now and then, that the ideas have influence in shaping more sensible policies. Indeed, I come to this conference in search of such signs, and the hope and determination that produced them.

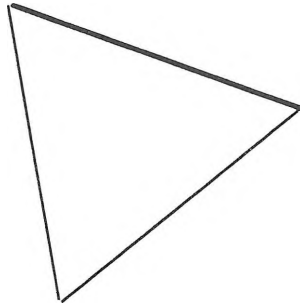
III. Earth at Night

A. *Prosperity, democracy, environment*

[overhead: democracy, prosperity, environment]

Concern for the natural environment is now ineradicably part of society. Over the past 70 years rich societies like ours have accepted the view that government and the economy are linked and should be linked. (Hence the darker line.) There are many economic issues on the public agenda now — trade with Japan, deficit reduction, property rights, tort-law reform. They suggest that the link between democracy and prosperity isn't a Republican or Democratic notion any longer. It is an accepted premise of the industrial nations from Japan to Poland, and from Sweden to South Africa.

Democracy



Prosperity

Environment

It is only in the past generation that we have come to realize that democracy and prosperity are incomplete without taking into account the place that the natural environment plays, and must play, in human affairs.

[slide: earth from space]

The implications of that realization are at once mundane and radical. Radical in the sense that we are in the midst of a transformation as profound in its implications as the industrial revolution; mundane in the sense that this is a revolution launched and nurtured by the middle class and by conventional wisdom — elements of society normally perceived as bastions of conservatism and convention. In that regard, the sustainable economy toward which environmentalism urges us follows a trajectory something like the rise of capitalism from the feudal order: taking root in privilege and emergent privilege rather than among the dispossessed.

The human economy now controls or manages 40 percent of the net primary production of the land. Another way to say that is that 2 of every 5 sunbeams falling on land is at work for us, growing crops or forests or lifting water for irrigation or otherwise benefiting our kind. Human populations are projected to double in the next several decades, and then double again; but we are running out of sunbeams to support that population.

In that sense, we are now venturing beyond the range of prior human experience. Yet the goal toward which we strive is not entirely unfamiliar: sustainability is one hallmark of the human past. Environmentalists seek from that past clues to guide us toward a stable future.

For the past generation, this image of earth from space has been the icon of environmentalism: our blue planet, living and fragile in the sunlight. This image has propelled a way of doing environmental policy that has been more rapidly accepted and more effective than any of its proponents would have guessed three decades ago, an approach that will, I believe, prove more durable than its enemies today expect. That approach has looked to natural science to diagnose environmental problems, and then relied upon environmental law to fashion cures, largely through government regulation. Throughout, this approach has focused on environmental impacts, as they are called, and assumed that the human beings affected by the regulations could easily adjust, or, in any case, did not belong in the landscapes they were polluting or overexploiting. The approach that put the natural planet above human interest may have been a useful antidote to the unrestrained pursuit of industrialism and development that marked the years after the Second World War. But this regulatory approach has its frailties, which are now plain to all those who work in environmental policy.

Yet even before November 1994, we were working on nonpoint pollution, and we were struggling with global climate change and dwindling biodiversity. All of these are matters beyond the reach of simple legal solutions, even when science can diagnose an underlying problem. So the search for a new way of doing policy began some time before the House of Representatives became a radical institution for the first time since Reconstruction.

And the blue planet is still here, still fragile. Today, I want to put before you a different perspective on that planet.

[slide: earth at night]

This image is called "Earth at Night." It was assembled by Woodruff Sullivan, an astronomer at the University of Washington. "Earth at Night" is a photomontage put together from weather-satellite photos. What it shows is that when one looks at our planet without sunbeams, what we see is ourselves: the human presence on the landscape is, literally, of planetary significance. "Earth at Night" symbolizes the tension between the economic activity that powers these human lights, and the environmental order of the blue planet we share with other living things.

The search for a sustainable economy will not be soon concluded. Even the objective — a pattern of economic utilization of the natural world that can be continued indefinitely — is not well-defined, since technology will continue to change, shifting the ways humans use natural resources. Moreover, conflict will continue to be ubiquitous, because at every turn environmentalists are asking people to change long-established, profitable ways of earning a living. Environmentalists must have good reasons when doing so.

It is far from evident that a sustainable economy is politically feasible any time soon. At a minimum, sustainability is not a simple goal.

That is the last lesson I want to leave with you. I have come to think of sustainability as a direction toward which we strive, seeking a community and a life that is worth the comforts and pleasures we derive from material wealth. In this, sustainability is like other myths that we rely upon to structure our shared reality, myths like justice, equity, and freedom. Like those myths, sustainability is important as a myth, as a target around which to organize communities and their collective activities. No one would say that humans have achieved justice or equity or freedom. No one should say that sustainability is at hand. But we are

beginning, in some ways seriously, and that must not be forgotten in the struggles that lie ahead.

It's time to stop swinging. The leadoff batter is standing on first base. I'll leave to you to judge whether it was a base on balls, a single, or a wild pitch that got me here.

Thanks.

Additional reading

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