Where Markets Meet the Environment

PERC REPORTS

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by Barun Mitra

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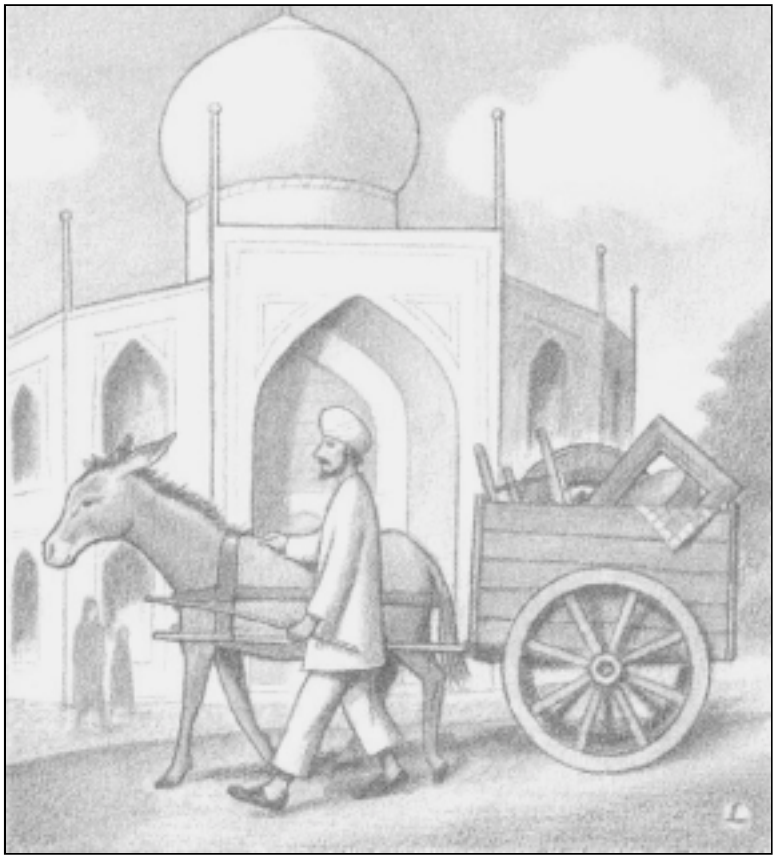

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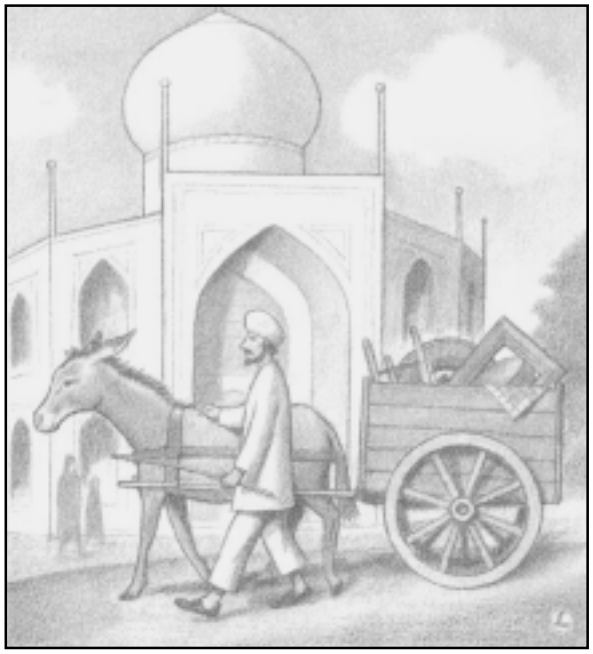
AN INTERNATIONAL PERSPECTIVE ON TRASH DISPOSAL

POVERTY, WEALTH, AND WASTE

By Barun Mitra

In 1986, a waste-to-energy plant opened in Delhi, India, financed by the Danish International Development Agency at a cost of over $10 million. The plant was expected to generate 3.8 megawatts of electricity from garbage, and its success was to be copied in other Indian cities. However, the plant was a failure. Two years later, the government was spending about $100,000 a year to burn garbage without producing energy. Surprisingly, the principal reason was the fact that there wasn't enough urban waste in Delhi.

It turns out that the waste—paper, rags, plastic, etc.—in Delhi produces only about half the caloric value of the waste from a Western city. This contrast tells us a lot about the treatment of waste in rich and poor countries and helps us to understand the importance of trade in waste.



In India, every bit of a resource is reused, recycled, or otherwise utilized. An enormous army of rag-pickers continuously supplies millions of trash merchants all over the country.

Poor societies can afford little waste in the traditional sense. Poverty ensures that every bit of a resource is reused, recycled, or otherwise utilized. In India, an enormous army of rag-pickers continuously supplies millions of trash merchants all over the country. They pick up virtually everything that might have a potential value. The rag-pickers, particularly in urban centers, have an unmatched capacity to extract and sort every bit of material that can be reused, recycled, or have other potential uses.

This interest in resource utilization pervades almost all strata of society. Families in India willingly wait for weeks in the hope of getting a higher price for their old newspapers. Trash dealers frequent homes on a regular basis to buy newspapers, plastic and glass bottles, discarded furniture, or household gadgets. These are then meticulously sorted and sold for reuse, repair, recycling, resource recovery, and any number of other uses.

The pattern of waste utilization changes from poor rural areas to small towns to big cities. In the smaller and poorer areas, the volume of actual waste is very small, because whatever material can have some possible utility is reused or repaired. Consequently, dealing with waste as an economic activity is minimal. As one moves into towns, waste acquires a more economically vibrant characteristic. Household consumption levels are higher, and so is the quantity of waste. Consequently, there are more trash dealers to exploit the economic potential of the larger volume of waste.

There are two reasons why recycling in poorer countries like India is so thorough. First, the low value of labor justifies the long hours spent extracting material. For rag-pickers, there are few other

ways to earn money. Second, because the country is poor, many products made from virgin raw materials are luxury goods, simply too expensive for most people. Thus, there is a ready market for reused and recycled goods.

The painstaking efforts to recycle materials do not mean that a poor country like India is pollution-free. Indeed, the low quantity of waste generated in an economy with technological backwardness and little capital keeps the waste industry from graduating above small-scale local initiatives. And higher pollution occurs because there isn't the technology to capture highly dispersed waste such as sulfur dioxide from smokestacks or heavy metals that flow into wastewater.

In contrast to the careful reuse and recycling of waste in poor countries, per capita generation of waste is much higher in wealthy countries (although pollution is lower). This obvious difference is often used to extol the virtues of lower consumption in poor countries and the evils of consumerist lifestyles in the latter. But the explanation is more complex.

Rich societies generate more wastes because their citizens can afford to do without the leftovers, whether in the form of food, packaging, worn-out clothes, or energy. Another way of looking at it is that the value of the waste, even while it is substantial in terms of weight or volume, is so small in comparison to individuals' disposable income that most people find the value of waste (in economic terms, the marginal utility of waste) to be quite low. Many cheap substitutes are of better quality. Many items that are reused in India are thrown away in the United States because they just aren't worth very much to people who can afford new products.

Does this mean that the economics of waste loses viability as a society becomes richer? It may seem that way, because waste handling is such a big issue in the developed countries. Yet the much greater quantity of waste generated, along with newer technologies, should make the waste industry more economically rewarding in richer countries.

Indeed, that has been the case, as Pierre Desrochers shows in "The Secret Past of Resource Recovery" (*PERC Reports*, Sept. 1999, 5–7). He reminds us that there was a flourishing waste processing industry decades before the major environmental statutes were enacted. And even today, a lot of waste, particularly industrial by-products, is sold for processing around the world.

Yet, as western nations grew wealthier, leftovers became more visible. This reflects a problem of institutions (the rules and laws that govern actions). First, there was more pollution because of the "tragedy of the commons." Since people could dump waste on commonly owned or open-access property (such as the air and water), some people didn't feel the need to develop waste disposal systems. Naturally, this increased the levels of pollution.

In richer countries, the much greater quantity of waste generated, along with newer technologies, should make the waste industry more economically rewarding.

Second, the market for wastes and by-product was not allowed to work to the extent that it could. Wealthy societies have the capability—and frequently the desire—to dispose of waste. They can pay people to cart off leftovers rather than seeking payment from the waste disposers, as poorer people do. Under a market system, as societies grow wealthier, this should lead to markets for the disposal of waste in landfills or incinerators.

Unfortunately, rather than privatizing resources, restricting access to them, and allowing markets in waste to develop, government agencies took over the role of regulating and even providing the service of waste processors (often, by owning landfills). Bypassing all evidence of how the private sector had been performing this service economically, the argument was made that private markets couldn't provide this service.

Without the disciplining influence of market forces, public agencies became inefficient and began to consider waste a problem, not a potential resource. So efforts were made to regulate or reduce the generation of waste.

Waste can again become a valuable resource if markets are allowed to develop, both within countries and internationally. Free trade in waste would allow the comparative advantage of societies to make waste processing economically viable and efficient. (There are already attempts by some entrepre-

neurs to hold Internet-based auctions of wastes.)

Rich societies with technological advantage and economies of scale could buy certain wastes from poorer countries where low volume makes processing more expensive. Poorer societies, with lower labor costs, could import other types of waste products from rich countries, augmenting their own low quantity and making processing viable.

Current rules thwart this process. Responding to the international agreement known as the Basel convention, India stopped the import of waste lead and zinc. This was probably economically and environmentally unsound. The low consumption level in India of products such as batteries means that imported waste is necessary to make recycling viable. Thus, the Basel convention may be contributing to a higher pollution load in developing countries by restricting trade that makes recycling feasible.

Trade creates wealth, and if free trade is allowed, including trade in waste, someday all countries can become wealthy. What will happen to waste? Not only will some trade in waste continue (as it does in wealthier countries today), but the greater productivity and more advanced technology will ensure reasonably priced disposal of the waste that cannot be traded. Meanwhile, both the economy and the environment will gain if we can bring back to life the much abused cliché "wealth from waste."

Barun Mitra is the founder of Liberty Institute, a research organization based in New Delhi. For more information about the institute, contact www.angelfire.com/mi/libertyinstitute.

FEAR IS REPLACING SCIENCE

NO "BIO-CORN" ON MY FARM THIS YEAR

By Blake Hurst

Prince Charles will be happy, Jeremy Rifkin ecstatic, and the European Union can rest easy. No genetically modified corn will be planted on my farm this year. Not because I have any doubt about the safety of what are now called GM foods. I've certainly never lost any sleep over producing "frankenfoods," as Greenpeace so charmingly likes to call my corn and soybeans. No, I won't use these products because fear is triumphing over science and common sense, and I'm afraid it will be hard to find a market for what I produce.

Farmers were shocked when genetic modification encountered protest on environmental grounds.

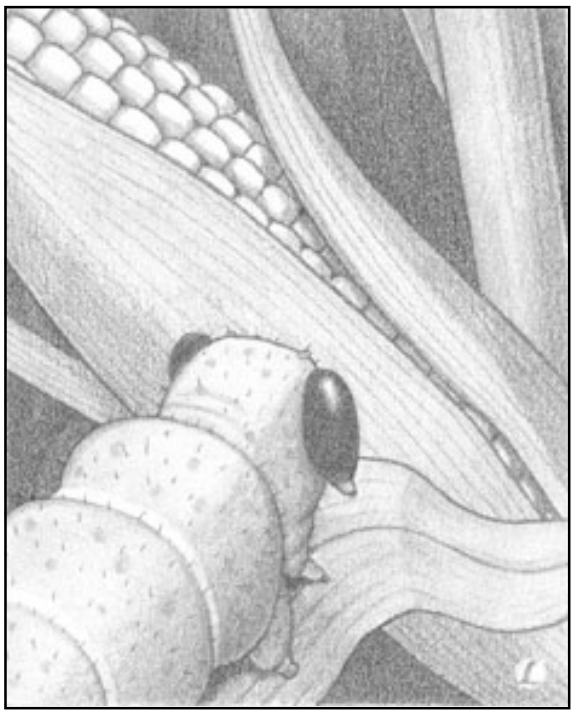
I will plant a few acres of Round Up Ready soybeans, which are also genetically modified, but only because most of my soybeans are processed for domestic animal feed. The corn I produce, on the other hand, may enter the export market, and some is used directly for human consumption. I'm afraid that if I do grow GM corn, I may have to sell it at a discount, if I can sell it at all.

Genetically modified corn produces a natural insecticide, Bt (*Bacillus thuringiensis*), which is deadly to the European corn borer, a pest that causes one billion dollars of damage to Midwestern corn fields each summer. The bacterium protecting the corn against the corn borer was introduced through the manipulation of the corn's genes.

Corn borers are familiar to anyone who has driven across my part of the world on a summer evening and found a blizzard of moths hitting the windshield. Those moths, at least the ones that don't end their days as a glutinous mess on your windshield, lay eggs that hatch into caterpillars. The caterpillars, or borers, drill into corn stalks, weakening the stalks and providing a place for disease to enter. The weak-

ened stalks drop their ears before the harvesters can gather the grain.

The billion dollars in damage attempts to measure wasted grain, but doesn't put a value on the frustration farmers feel as they harvest corn infested with borers. The stalks fall over in the first fall breeze and don't feed into the combine. Harvest is slowed as I and thousands of farmers like me stop and clear the downed stalks tangled at the front of the harvester. Not to mention the skinned knuckles and bruised muscles and colorful language that accompany each trip to the front of the combine to remove the tangled mess that is a direct result of damage caused by corn borers.



If we were to spray the Bt bacterium on our cornfield with an airplane, it would be considered an organic method of pest control. The reason: Bt occurs naturally.

Not surprisingly, then, farmers rapidly adopted the new corn. We are excited about the prospect of increased yields, reduced costs, and more trouble-free harvests.

That rapid adoption of genetically modified crops hit a brick wall this past fall when Japan and the European Union balked at buying genetically modified grain. As if that weren't bad enough, Gerber has announced that it will no longer use genetically modified grain in its baby foods, and early this year Frito-Lay stopped purchases of such grain. Gerber's reasoning is hard to take seriously, as Gerber's parent Norvatis was, at the time of the announcement, one of the world's largest producers of genetically modified seed.

It would be difficult to be more disingenuous than Gerber, but Frito-Lay succeeded. The producer of potato chips supposedly acted through concern about health, yet the science linking fat and salt to ill health has advanced much farther than any scientific evidence of harm from bio-foods. And then protestors at the World Trade Organization talks in Seattle trashed Starbuck's during a week-long temper tantrum over the twentieth century, with bio-foods one of their many targets. It's not clear, at least to me, that there is any connection between corn borers and latte.

Modifying the genes of seeds is different from traditional methods of improving crops, but farmers and plant breeders have been selecting for desirable traits since the science of agriculture began. Instead of adding a whole series of genes with unpredictable results, as breeding does, genetic splicing allows scientists to choose a single gene with a single, desirable trait.

Farmers were shocked when genetic modification encountered protest, especially on environmental grounds, because genetic modification allows us to cut our use of man-made chemicals as we tend our crops. A six-state survey of farmers last fall found that 26 percent of farmers were reducing their use of insecticides because they used Bt corn; fully half of the farmers planting Bt corn were applying no insecticides at all. On the genetically modified soybeans on my farm we will apply only one chemical, and an extremely safe one at that, instead of the battery of four herbicides that will be used on the rest of our soybeans.

In a final irony, if we were to spray the Bt bacterium on our cornfield with an airplane, it would be considered an organic method of pest control. The reason: Bt occurs naturally.

Swiss researchers have added genes to rice that increase the amount of beta-carotene, the precursor to Vitamin A, in the rice. If the new technology is adopted in Asia, some of the quarter-million children who each year lose their sight will be spared the curse of blindness. Gilbert L. Ross, medical director of the American Council on Science and Health, points out that "millions of transplant, cancer, and hepatitis patients" are benefiting from bioengineering, not to mention the diabetics who depend upon insulin produced by genetic modification. However, none of these products is mentioned when

people protest the use of this new technology.

Instead, we hear about the monarch butterfly. It should come as no surprise that Bt is harmful when force-fed to butterflies (as studies have shown). Indeed, it would be more surprising if it didn't affect them, since they are closely related to corn borers. But the chemical alternatives to Bt corn are tough on butterflies too, along with all other insect life in the area. And as a number of researchers have pointed out, monarchs eat only milkweeds, which don't appear very often in cornfields. At least I work very hard to make sure they don't.

Two-thirds of the soybeans planted in the United States and one-third of the corn are genetically modified. Every time a consumer opens a soft drink he or she is consuming a GM product, because the drink is sweetened with corn syrup. Almost all processed foods contain soybeans in some form or other. There is no scientific evidence tying these foods to any health hazard. Genetic modification is making food more affordable, cutting down on the use of man-made plant protection products, and helping agriculture keep up with the worldwide growth in income and population. It would be a crime if those advantages were lost to a cynical campaign by those who use fear when science isn't on their side.

Blake Hurst raises corn and soybeans with his father and two brothers on their farm in northwestern Missouri.

A MODERN PROPERTY LAW SAGA

RETURN OF FEUDALISM: A CASE HISTORY

By Roger E. Meiners and Andrew P. Morriss

Gradually, landowners in the United States today are coming to resemble feudal serfs. Although we hold rights to the real estate titled in our names and are taxed on our property, more and more our rights to use a piece of real estate are for increasingly limited purposes. These purposes may change at the whim of one of the lords of "our" estates—federal, state, or local governments.

The case of Lloyd Good, a property owner, illustrates where we are now in the transition from traditional strong common law rights to fiat rights granted by governments.

The case of Lloyd Good, a property owner, illustrates where we are now in the transition from traditional strong common law rights to fiat rights granted by governments. Since Good's case was recently concluded at the U.S. Court of Appeals,[1] we know the details of the twenty-six year story and summarize it here.

In 1973, Good purchased property on Lower Sugarloaf Key, Florida, a part of Monroe County. In 1980, Good took steps to develop about ten acres of his property for residential lots on canals that would allow direct boat access. After hiring a firm to begin the process of obtaining permits from various agencies, Good received a permit from the Army Corps of Engineers in 1983 that would allow some dredging and filling of wetlands. The county government objected to the permit, however, so the construction plans were amended and a new Army Corps permit, valid for five years, was issued in 1984, subject to further Corps amendments. The Corps insisted that Good wait for further review, which resulted in a third permit being issued in 1988, one that further reduced the construction area.

During the eight years that the Army Corps was

evaluating matters, Monroe County instituted new restrictions to put development "in harmony with natural ecology."[2] When Good sought a building permit, the county rejected his request, saying it had a moratorium on all major developments. Good appealed to the Monroe Country Board of Adjustment and was rejected. A further appeal to the Monroe County Commission was successful, however, and Good was issued a dredge and fill permit in 1984. A state agency, the Florida Department of Community Affairs, then appealed the county's approval of Good's permits to another state agency, the Florida Land and Water Adjudicatory Commission (FLAWAC), which, in 1986, rejected the building plans.

In the meantime, the county had issued new construction rules that posed new barriers for Good. Good sued FLAWAC in state court. Although the state court held in 1987 that the permit rejection was improper, it nonetheless required Good to comply with the new Monroe County rules that had gone into effect after the improper permit rejection.

Good prepared new development plans, which were filed in 1989. Five months later, the county granted preliminary approval, subject to approval also being granted by a third state agency, the South Florida Water Management District (SFWMD). Good dutifully applied to SFWMD. Six months later, in 1990, the application was rejected. In the meantime, the preliminary approval from the county expired since it had a one-year limit on its validity, thereby requiring Good to begin a new application to the county. Good informed the Army Corps of his problems with state agencies and scaled back his development proposal to the Corps in an application filed in 1990.

During the years Good spent in this regulatory labyrinth, three species that live on Sugarloaf Key were added to the endangered species list: a turtle, a rabbit, and a rat. The listing now obligated the Army Corps and the Fish and Wildlife Service (FWS) to take this wildlife into account in evaluating Good's 1990 permit application. The Corps and the Fish and Wildlife Service tussled over the matter, the Corps allowing its permit to stand, the FWS recommending that it be revoked until further biological studies had been done. In 1991 the FWS released a new biological study, which urged further restrictions on construction. Good responded in 1992 with an opinion by an environmental consultant he hired, who claimed that the development would not impact the endangered species.

In 1994, the Corps denied Good's 1990 application on grounds of habitat loss for endangered species and notified Good that his 1988 permit had expired and would not be reapproved. Good sued the federal government later in 1994, contending it had taken his property for habitat protection. Although in 1995 the Fish and Wildlife Service issued a report that it would approve scaled-back development (8 lots versus the 54 originally planned), Good's Army Corps permits had all expired and he proceeded with his suit. The Court of Federal Claims then denied Good's claim because habitat protection did not destroy *all* economic value. Good appealed to the U.S. Court of Appeals, which, in 1999, also held against him.

Twenty-six years after the purchase of the land and nineteen years after beginning the permit approval process, the appeals court held that Good had no suit for compensation.

Twenty-six years after the purchase of the land and nineteen years after beginning the permit approval process, the appeals court held that Good had no suit for compensation, essentially because not all economic value in the property had been destroyed. While none of the relevant statutes or regulations blocking his development had been in place when Good bought the property, the court found that at that time (1973) the Army Corps "had been considering environmental criteria in its permitting decisions."[3] Good thus had to know that "rising environmental awareness translated into ever-tightening land use regulations."[4]

No doubt Good was aware that the rules regarding development were ever tightening, although given that the delays in his development all stemmed from the government agencies it is hard to know what he could have done to speed things up. Nor do we doubt that the decision of the court is correct; the Supreme Court has held that unless a regulation destroys nearly all economic value of land, there is no taking. Hence, the odds of compensation being required when "only" 85 percent of the building plans

are eliminated is very unlikely. Good's case is not unique; developers can repeat many such stories.

Property owners must know that, as they enter into nearly endless permit procuring processes, the rules could tighten ever more, so one could well be in an endless loop. There is no redress for landowners who incur massive bills for lawyers, environmental consultants, permit specialists, and others, with no certainty in outcome. The permit givers have the most legal ability to determine land use. Lloyd Good is like a feudal serf, allowed to use a piece of a federal-state-local estate for limited purposes that may change at the whim of one of many representatives of the crowns.

If Good's story were unique, it could be tsk-tsked as an aberration and he as an unfortunate soul lost in the bowels of the normally well-meaning bureaucracy. But this story is no aberration. Ocie and Carey Mills are other Floridians who ran afoul of the permit process. They were sent to twenty-one months in federal prison for dumping nineteen loads of builder's sand on a quarter-acre lot in a developed suburb, where Ocie was helping his son Carey build his home.

In a nutshell, the general rule regarding governmental regulation of private property is as follows: As long as there is a statutory basis for a regulation, and regulators have jumped through the appropriate procedural hoops in writing and enforcing regulations under the statutory authority granted to them by the federal or a state legislature, nearly any control may be imposed on any property. Only if there is near total destruction of the value of the property by a change in regulation need there be compensation under the takings clause of the Fifth Amendment.[5]

Short of taking title to property or destroying its economic value, agencies may, under a variety of statutes, destroy most of the value of property or effectively force it to be used for purposes favored by the agencies. The threat of such action is enough to force many landowners to "cooperate" in an effort to salvage some of their property. In ways that have enormous ramifications for our nation's future, our property is less and less our own.

Notes

1. *Good v. U.S.*, 189 F.3d 1355 (Fed.Cir. 1999); *Good v. U.S.*, 39 Fed.Cl. 81 (1997).
2. 39 Fed.Cl. 81 at 87.
3. 189 F.3d 1355 at 1361.
4. Id. at 1362.
5. The most noteworthy case is *Lucas v. U.S.*, 505 U.S. 1003 (Sup.Ct., 1992). A classification of beachfront property formerly zoned residential was changed to beach preservation, thereby prohibiting construction; the Supreme Court held that the state of South Carolina had the right to change the classification of the property but, by doing so, knew it was taking all the value of the property and so must provide compensation for the loss David Lucas suffered.

Roger E. Meiners and Andrew P. Morriss are Senior Associates of PERC. Meiners is a Professor of Law and Economics at the University of Texas at Arlington. Morriss is a Professor of Law and Associate Professor of Economics at Case Western Reserve University. This excerpt is taken from their paper, "Property Rights in a Complex World," prepared for a conference at Florida State University directed by Randall Holcombe and Samuel Staley.

GREENER PASTURES

PRIVATE INITIATIVES

By Linda E. Platts

CORN CAN DO

Plastics made from plants is an idea that scientists have touted for years, but no one was able to bring it to the marketplace. That has changed with an announcement from Cargill Incorporated and Dow Chemical Company. In a joint venture, the firms plan to build a $300 million facility in Blair, Neb., to manufacture plastic products from corn.

A new technology uses plant sugars to make a durable plastic material called polylactide (PLA). It is derived entirely from renewable agricultural crops and can compete with petroleum-based plastics in cost and performance. It is also biodegradable and does not produce the wastes or potentially hazardous by-products of plastics made from petroleum.

Located in the heart of corn country, the plant is close to sources of natural plant sugars and adjacent to an existing Cargill corn milling plant. Operations are slated to begin in late 2001, providing what the company calls "high value" jobs for 100 technicians and operators. It will produce 140,00 metric tons of PLA annually. That sounds like a lot of plastic, but being biodegradable, it shouldn't be around for long.

—Environmental News Service

OLD GROWTH RISING

Breaching the Edwards Dam on Maine's Kennebec River last July to help fish had an unexpected benefit for furniture-makers, wood craftsmen, architects, musical instrument-makers, and even pen-makers. Old growth timbers have been salvaged from the dam's foundation for use in a host of wood products.

Most of the trees were taken from the Maine woods in the 1830s when the dam was built and have spent more than 150 years submerged in the waters of the Kennebec. White pine, spruce, and hemlock, as well as oak, maple, and birch, have surfaced in nearly perfect shape. And many would say the wood is even more beautiful today than when it was first cut. The water has pulled the sap from the logs and deposited minerals in the growth rings, creating a stunning pattern of soft earth tones.

PerkinsWood, which is conducting the salvage operation, estimates that it will recover 660,000 board feet of old growth timber without cutting a single tree. The logs must be pressure washed and kiln-dried in a specially built oven before they are ready for sale.

The novelty of the wood's origin will increase the value of the products and some of that increased value will find its way back to the river. The pen-maker intends to donate $2 from each of his pens to Maine Rivers, a conservation group that protects and restores rivers.

—Environmental News Network

GREENING NEPAL

Once-denuded slopes in the foothills of the Himalayas are showing signs of green again. In Nepal, local community groups are managing the forests, deriving income from the timber, and also protecting watersheds and a variety of rare birds, mammals, and flowering plants.

In 1957, the government nationalized the forests, but it had neither the will nor the means to protect them. Over the next 35 years, rampant cutting cost the country nearly half of its trees. Legislation passed in 1993 turned the management of national forests over to local user groups and reversed the deforestation. With the aid of $12 million from the

Australian Forestry Program, a network of 5,000 forest user groups was created. They can harvest wood and animal fodder from their local forests and cut mature trees to sell for profit, but they must plant ten trees for every one that is cut.

During the last five years, the forest has grown thick and green over 45 hectares of hillside near one village. So far, the families living there have removed only fallen branches, but they are all carefully tracking the clumps of maturing bamboo. Each clump will be worth $300 when it is harvested, nearly a year's income for most Nepalese.

While deforestation at higher elevations has not slowed significantly, the lower foothills have thousands of hectares of newly planted forests and show a 10 percent increase in forest cover. Nepal's renewed forests have reduced massive soil erosion and down-river flooding, while protecting rare species and providing new income to the local people who care for them.

—Toronto Globe and Mail

HARVESTING TOXIC WASTE

Bananas are growing in a mine drainage tunnel in Leadville, Colo. Along with carrots, spinach, beets, and broccoli, these crops may provide the solution to cleaning up one of the nation's most polluted Superfund sites.

Entrepreneur Frank Burcik, president of Water Treatment and Decontamination International, created the underground greenhouse to remove toxic heavy metals from the mine's contaminated runoff. Initially, he used wetland plants in his phyto-remediation efforts, but with only modest success. Since then, he has switched to a fruit and vegetable line, but not for eating. His new approach includes harvesting the plants once they become saturated with metals, followed by reseeding.

Early results show that the plants can remove about 71 percent of the contaminants at a rate of almost 5 gallons per minute. Expanding the size of the planted area should speed up the process.

The Environmental Protection Agency is keeping a close eye on Burcik's project as it sees many applications for the process. The World Bank sees possibilities for environmental cleanups in developing nations, and domestic mining companies have expressed a keen interest as well.

Meanwhile, Burcik is going full throttle in Leadville with his eye on rescuing the economically floundering town. He envisions an organization that would not only clean up the pollution, but also attract scientists to conduct phyto-remediation research, and employ workers in a particle-board factory using the remains of harvested plants.

—Denver Post

GOING WITH THE FLOW

Nestled between a national park and a proposed wilderness area and cut through by the beautiful Virgin River, Utah's Horse Valley Ranch is probably one of the West's most coveted pieces of real estate. Despite its potential value on the open market, the owners had no desire to create a landscape of ranchettes or endanger the river. They protected both land and river by donating development rights and water rights to the Grand Canyon Trust in Flagstaff, Ariz.

While conservation easements have become an increasingly popular way for private owners to protect land from development, the donation of instream water rights to protect streams and rivers is still relatively unknown. The owners donated 20 acre-feet of water annually for instream flows in the Virgin River, which is home to several threatened and endangered fish. In return, they will receive tax benefits for both their land and water donations.

The trust will hold the land easement in perpetuity, but the water rights will be transferred to the Utah Department of Natural Resources, which at this time is the only entity in Utah legally able to keep water instream for the benefit of the environment. Frequently, ranchers would prefer to leave their water instream for fish and wildlife rather than irrigate marginally productive land. However, this common-sense solution is thwarted by the "use it or lose it" rule.

In many Western states, the law requires owners to use their water for agricultural, municipal, or industrial purposes. If they leave the water in the stream, they forfeit their water right—a death knell in the West. To avoid this onerous penalty, owners can donate water rights to conservation groups, which must then deed the right to the state if the water is to be kept in the stream.

Conservation groups are hopeful that examples such as Horse Valley Ranch will persuade others that donating water rights for instream flows is just as important as donating development rights to protect open space.

—Salt Lake Tribune

PUBLIC VS. PRIVATE: A DEBATE

A CONSERVATIVE MANIFESTO?

Peter Huber and Joseph Bast

Excerpted from "A Conservative Manifesto," in *Hard Green: Saving the Environment from the Environmentalists*, by Peter Huber (Basic Books, 1999, p. 201-202).

Private Conservation

Private conservation is, by a wide margin, the most important form of conservation we have. Much of the time, effective conservation is possible on a scale that is commensurate with private ownership and control. We support private conservation initiatives wholeheartedly.

Public Conservation

We recognize, however, that at some point the vastness of White Mountains and Everglades, of river archipelagos and coral reefs and the sheer scope and scale of the most ambitious conservation objectives require a reach to match. That means the reach of local, state, and federal governments.

We recognize that private fences cannot always conserve the value of the wilderness. Great, wide-open spaces are valuable because they are great and open. A vital part of Yellowstone's grandeur, and our own, is that it belongs not to Wall Street but to America. Value that inheres in citizenship, nation, patriotism: Such values cannot be contained or conserved in any private market. To privatize here is to destroy.

Government can play an essential role in husbanding and expanding the wilderness. The point of conservation is to be economically inefficient and unproductive, to retard conventional economic progress, not promote it, to do so in well-designated places, set aside for that specific objective. Conservative government can and should advance these objectives, where private ownership cannot.

■ ■ ■

COMMENT

HARD TO SWALLOW

By Joseph Bast

With *Hard Green*, Peter Huber has written an original and spirited critique of radical environmentalism. It makes for entertaining and informative reading, guaranteed to upset readers across the span of politics and ideologies.

Huber's greatest achievement is untangling and debunking the six themes of antimarket environmentalist thinking. He exposes the fallacies and illogic behind the Malthusian's fear of scarcity, the Luddite's fear of complexity, the socialist's contempt for property, the communist's belief in central planning, the ascetic's love of frugality, and the

New Ager's search for a secular religion.

Much of what he proposes to put in its place, as indicated by the above excerpt from his "Conservative Environmental Manifesto," is consistent with the paradigm known as free market environmentalism. Much, but not all.

"Our solution for scarcity," Huber writes, is "markets. For pollution: property. For complexity: evolution. For efficiency: markets. For wilderness: wilderness itself." (175) The first four elements are fine, but what about "for wilderness, wilderness itself"? Some readers will find that last statement puzzling, and rightly so.

Huber believes markets and private property solve all threats of scarcity *except one*, "the one great scarcity that matters, the looming scarcity of wilderness and wildlife" (109, see also 179, 196). Private property and markets can and do conserve wilderness "better than government ever could," (93) he says. However, private landowners aren't up to the task of managing land solely for aesthetic reasons when the land in question is really large (90–91, 202) "far flung," (93) or so unique and special, like Yellowstone, that "with such things, to privatize is to destroy" (90, also 157, 202).

Government, according to Huber, can manage land for conservation because "nothing is the one thing that big government is capable of doing quite well, and doing nothing is the paramount objective of conservation." (xxiv, also 92) Governments have failed to be effective conservers in the past because we gave governments "economic resources" to manage, like cow pastures, when we should have given them only "uneconomic" resources, (99, also 157, 202) and we asked government agencies to "balance the opposing objectives of economic use and conservation," a task that dueling interest groups prevent them from accomplishing (93).

While free marketers such as myself may agree that "nothing is the one thing that big government is capable of doing quite well," that does not justify Huber's "wilderness exception." For one thing, markets do a fine job meeting the demand for classical music, abstract art, Beanie Babies, and Pokémon trading cards—all things consumed only for "aesthetic" reasons. Huber gives us no clear reason why markets and private property can't also produce sufficient supplies of wilderness and wildlife.

He does suggest that size alone may justify government ownership. Yet the size of a conservation area does not tell us anything about the optimum size of the entity charged with its management. Decentralized ownership that allows for experimentation and a diversity of visions may be superior to control by a single huge bureaucracy. Do national treasures such as Yellowstone convey a sense of national purpose or pride because they are government owned, or would they be just as inspirational if privately owned? Certainly, if privately owned, they would be better managed. Huber notes that Yellowstone has been "badly mismanaged" (90).

Government, according to Huber, can manage land for conservation because "nothing is the one thing that big government is capable of doing quite well, and doing nothing is the paramount objective of conservation."

Most important, effective wilderness conservation requires much more than "doing nothing," as countless wildfires, dead and dying trees, and other ecological catastrophes on public lands attest. Deciding where and when to allow recreational activities on this land requires management of roads, facilities, and rescue and security services. Even keeping people out of protected wilderness areas requires effective management.

The idea that government would be a competent manager if limited to managing only "uneconomic" areas (196) also flounders on the fact that no piece of land is "uneconomic" in the sense that Huber intends. That is, no piece of land is inherently outside the market process. All forests, lakes, shores, and wetlands have development potential of one kind or another and thus have owners who incur opportunity costs if future development is prohibited. So there is no class of natural resources that government is somehow naturally equipped to manage.

Huber's "wilderness exception" has two negative

consequences for those seeking an alternative to antimarket, antitechnology environmentalism. The first is theoretical. Huber opens the door to government intervention whenever aesthetic considerations exist . . . and where do they not? The list of candidates for government action is endless, starting with the Beanie Babies and Pokémon trading cards mentioned above. Huber himself suggests that governments might legitimately intervene because some people "dislike chemicals," "prefer pure drinking water," and want to "put up with much less pollution than their parents did" (136), even in the absence of a scientific foundation for these concerns or any consideration for the costs of the remedies or the injustice to those who bear those costs.

The second negative consequence is strategic. The millions of people who live and work in close proximity to nature are a credible and important voice for the sound-science, market-based approach to environmental protection. Telling ranchers, farmers, miners, loggers, well-diggers, and others that they must sell their land to the government so it can be set aside for the aesthetic pleasure of urban dwellers will raise loud objections. This is not just a theoretical objection: Increasing the public sector's budget for buying land is at the center of a major controversy in Washington right now, with opponents arguing persuasively that rural landowners are being harassed and pressured to sell their land against their will.

Peter Huber is extremely smart, a colorful writer, and he delivers more insights and ideas per page than any other writer on environmentalism today. But its open-ended endorsement of the use of government to conserve wilderness makes *Hard Green* a creed that conservatives, libertarians, and millions of people living and working in rural America will find hard to swallow.

Joseph Bast is president of the Heartland Institute and coauthor of Eco-Sanity: A Common-Sense Guide to Environmentalism *(Madison Books, 1993, second edition 1995).*

RESPONSE

CHEW YOUR BEEF

By Peter Huber

Joseph Bast is so determined to beat Teddy Roosevelt in the next election that he can't seem to focus on much else.

As readers of *Hard Green* know, I present T. R. as the political model around which conservative environmentalists should rally today. T. R. learned his conservation the hard way, raising cattle on his Chimney Butte ranch in Dakota, and through the Little Missouri Stockmen's Association that he founded. He was an avid outdoorsman and hunter. I argue that the author of *Hunting Trips of a Ranchman* would waste no time at all with the author of *Earth in the Balance*—Al Gore. T. R. would hardly recognize the environmentalism of the man who now bids to succeed him.

Bast's caricature of my views may be red meat for the ideologically pure, but it isn't my book. *Hard Green* declares: "All in all, private conservation is, by a wide margin, the most important form of conservation we have. A great deal of conservation occurs on the entirely private ranches and estates, private lands, shores, and lakes. Private land trusts are by far the most important and fast-growing factor in the conservation movement today, particularly in the rural West and Southwest. . . . Nor does public conservation have to be federal; most of it is better managed by local or state governments. . . . Hard Greens will never call for federal management where private, local, or state initiative will do" (91).

And then—only then—I concede: "But an incontrovertible fact remains: some values depend on doing things on a scope and scale that is inescapably

public" (91). Bast's beef with me isn't about private conservation. He just can't bring himself to concede some role—any role!—for public conservation in the mix. T. R. and Al Gore both do, so Bast can't tell them apart.

Unless he's prepared to reject all public conservation everywhere, Mr. Bast must offer us his own standard for where he thinks it might be appropriate. He doesn't even try. *Hard Green* does. In it, I argue that the choice between private, local, state, and federal should be practical, depending only on how broad a reach is required to achieve the objective. And I argue that the one good and sufficient reason to conserve is because many Americans find wilderness areas beautiful, today, not because some elaborate computer model humming away on the banks of the Potomac tells us we must conserve to improve rainfall in Rwanda fifty years hence.

Bast's unequivocal objections to public conservation could be applied word for word against public protection of human life and private property. Most of that can be left to private initiative too, and should be, and most of it is. But we practical types in the "wilderness exception" camp are inclined to make an exception for the Joint Chiefs of Staff, too.

Markets can't produce what exists, by definition, outside the market—what we value because it's spontaneous, open, and free.

Bast fulminates against city slickers who would rob the good country folk of their land. He has me "telling ranchers, farmers, miners, loggers, well-diggers, and others that they must sell their land to the government so it can be set aside for the aesthetic pleasure of urban dwellers." Nonsense. I'd like to see the government buy more wilderness that's ecologically special and sell off more that isn't. But throughout *Hard Green* I emphasize that environmental policy must be developed non-coercively, in careful deference to settled private rights and expectations. Bast just can't imagine that local, state, or federal governments might ever buy wilderness areas from willing sellers at market prices. I can.

Bast sounds as though he views public authority over public land in much the same way as Al Gore views private authority over private land. The old left grabs all it can from private owners, in its sly game of expropriation by regulation. The new right—when Bast speaks for it—seems determined to grab all it can from public land, and to be equally sly about what it's up to. "How do you turn a 'welfare queen' into a 'rugged conservative individualist'? Hand her a cowboy hat, a chain saw, or a pick-axe. Give the food stamps to her cow." No, I don't believe a word of that myself, and I don't suppose Bast does either. But he sure does make it easy for our opponents to portray us that way.

Bast only undermines our shared objectives when he solemnly wonders why "markets and private property" can't "produce sufficient supplies of wilderness and wildlife." Markets "produce" wilderness? Most ordinary people will laugh at the thought. Wilderness, they suppose, is what's out there before the property lines and fences arrive. But markets produce classical music, Bast insists. Indeed. But markets can't produce what exists, by definition, outside the market—what we value because it's spontaneous, open, and free, because it's not packaged, traded, bought, or sold. And most ordinary people who love the wilderness rank those aspects of it very high indeed.

Bast suggests that Yellowstone might convey as great "a sense of national purpose or pride" if it were owned by Disney. I doubt that one in a hundred of our fellow citizens would agree, and that's the only measure we have of national purpose and pride. Bast insists that "decentralized ownership" often outperforms the "single huge bureaucracy" in conserving wilderness. So far as "often" goes, I fully agree, and say so a lot more emphatically in *Hard Green* than Bast lets on. All he adds is that private ownership "may" be better even for the biggest things that we might wish to conserve. He's wise to stick with "may," and to refrain from any mention of the first "big thing" that people ask about when the issue gets debated—the Grand Canyon.

So I await his concrete proposal for privatizing it. I'm sure that dozens, perhaps hundreds, of people across the country will find Bast's Canyon Privatization Plan much easier to swallow than *Hard Green*. I urge them all to buy it when it's published.

Peter Huber is a Senior Fellow at the Manhattan Institute and a columnist for Forbes.

WHERE RESEARCH AND POLICY MEET

TANGENTS

By Daniel K. Benjamin

economist, n. *a scoundrel whose faulty vision sees things as they are, not as they ought to be.*
—after Ambrose Bierce

In a finite world, the conventional wisdom tells us that we shall eventually run out of nonrenewable resources, such as crude oil, iron ore, and bauxite. And long before exhaustion actually takes place, this same wisdom informs us, the growing scarcity of these resources will limit our ability to consume. These views have led to fears of "running out of oil" and have even spawned books and movies depicting the resulting chaos. Yet according to recent research by Martin Weitzman (1999) of Harvard, the economic impact of exhausting nonrenewable resources is far less important than you might think. Indeed, it appears that by failing to explicitly account for exhausting such resources, we are overstating our welfare by one percent at most.

Because the earth is finite, physical stocks of nonrenewable resources must shrink over time. Barring other developments, this reduction in supply tends to push up the prices of these resources. People respond to these higher prices by using other factors of production instead, but this means devoting more and more of other resources to coping with the disappearing nonrenewable resources. We somehow must account for this coming rise in scarcity if we are to accurately judge our current well-being.

For example, when the price of oil rises, we can adjust by developing more fuel-efficient cars. But this comes at a cost, a more expensive new engine. This cost is not properly reckoned with by orthodox income measures. The cost of developing the improved engine is conventionally counted as part of income yet it represents an expense that would be unnecessary if oil were renewable. And so, the question is, by how much are we worse off because some resources are in fact nonrenewable?

The answer, it turns out, is fairly easy to calculate: We need only adjust current income, measured as net domestic product, downward by the value of the nonrenewable resources exhausted in creating that income. For example, in one recent year, the world used up about ten metric tons of silver. Its market value after deducting extraction costs was $40 million per ton. Thus, to account for the nonrenewable nature of silver, $400 million should be deducted from world income figures.

Weitzman says that current income need be adjusted downward by 1 percent at most to account for the loss of exhaustible resources.

The logic of the Weitzman adjustment is much like what economists already do when they go from gross domestic product (GDP) to net domestic product (NDP), accounting for the depreciation of the capital stock. When output is produced, some of the capital is used up—it depreciates. If we want to continue to produce at the same rate, the capital stock will have to be replaced. Net domestic product adjusts for this; GDP does not. Weitzman has devised a way to make a similar adjustment to net domestic product to account for the exhaustion of nonrenewable resources.

In effect, the income that nonrenewable resources *seem* to generate is merely temporary—it cannot be sustained forever. So if we want a measure of our permanent income—that which can be sustained for generation after generation forever—we must de-

duct this temporary component from net domestic product. Weitzman does this computation for the key exhaustible resources, ranging from bauxite to zinc, and crude oil to iron ore. His conclusion is that current income need be adjusted downward by only about one percent to account for the gradual loss of exhaustible resources. The key players in this calculation are the energy resources: oil, natural gas, and coal. Crude oil accounts for half of the necessary adjustment to income, and the combination of oil, gas and coal amounts to about 90 percent of the total.

There are two ways to judge the significance of Weitzman's one percent figure. Current income also fails to properly reflect our wealth because it does not account for future growth due to technological progress. On this account, current income tends to understate—by some 40 percent—a more accurate measure of income that would account for the importance of future technological change. This understatement obviously swamps the effects of nonrenewable resources. Or, as Weitzman puts it, "policy concerns about running out of [exhaustible resources] should carry only about one-fortieth the weight of policy concerns about the effectiveness of R&D" (705).

If this seems to be a large role for technological advance, it must be remembered that over the last century, humankind's ingenuity in getting more from less has had a peculiar, albeit salubrious, effect in the area of exhaustible resources: For most of these resources, economic (as opposed to physical) supplies seem to be *growing*. Proven reserves are getting larger, and, as witnessed by the famous bet between Paul Ehrlich and the late Julian Simon, prices of many nonrenewable raw materials have been stable or falling. Thus, though we may not be quite as rich as we think we are, it appears that we also are not nearly so rich as we are going to become.

Another way to view Weitzman's results is to think in terms of per capita income in the U.S. today. Adjusting income down to account for nonrenewable resources means we should knock off about $250 per year for each man, woman, and child in the U.S. Although this is a sum surely worth contemplating, it is not something—in my estimation—that merits donning a hair shirt.

Reference

Weitzman, Martin. 1999. Pricing the Limits to Growth from Minerals Depletion. *Quarterly Journal of Economics* 114(2): 691–706.

Daniel K. Benjamin is a PERC Senior Associate and Professor of Economics at Clemson University. "Tangents" investigates policy implications of recent academic research.

what's new PERC UPDATE

Terry Anderson and **Bruce Yandle** spoke on environmental policy to 100 congressional staff members in January at a seminar sponsored by George Mason University's Mercatus Center. Yandle also lectured on measuring economic freedom at the Center's annual staffers' retreat in Charlottesville, Virginia.

A Citizen's Guide to Smart Growth, edited by **Ronald Utt** and **Jane Shaw**, will be published by the Heritage Foundation and PERC in April. Authors contributing to the volume in addition to Utt and Shaw include **Angela Antonelli**, **John Charles**, **Wendell Cox**, **Steve Hayward**, **Don Leal**, **Samuel Staley**, and **Richard Stroup**. For copies of *A Citizen's Guide* contact the PERC office. The book will be launched April 26 at a national conference on sprawl and smart growth in Chicago sponsored by the Heartland Institute and other organizations, including Heritage and PERC. To attend the Chicago conference, contact **Joe Bast** (jbast@heartland.org).

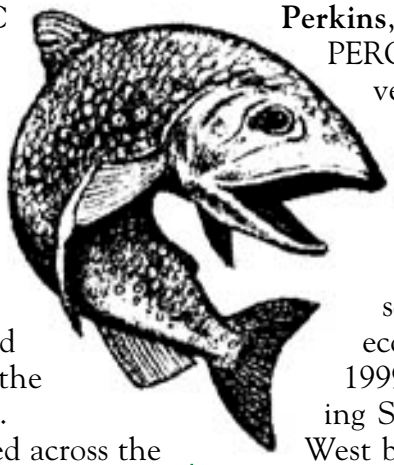
PERC UPDATE

PERC Senior Associate **P. J. Hill** and his Wheaton College colleague **Seth Norton** addressed a workshop in Nairobi, Kenya, dealing with poverty in Africa. The meeting of about 25 church leaders was sponsored by the Council of Anglican Provinces of Africa. Hill and Norton discussed property rights and economic growth.

■

Don Leal attended Safari Club International's annual Hunters' Convention in Reno, Nevada. He distributed PERC's *Hunting for Habitat* handbook (written by Leal and Bishop Grewell) and discussed innovations in using markets to foster greater wildlife populations.

Bishop Grewell represented PERC and the Atlas Economic Research Foundation at the World Trade Order meeting in Seattle, where opposition to trade erupted. He has written two articles as a result of his experience.



Holly Lippke Fretwell presented a critique of current public-land management at a forum on public lands sponsored by the Federalist Society and the Environmental Law School at the University of Idaho, in Moscow, Idaho.

In February, **Clay Landry** traveled across the Atlantic to participate in a conference in the United Kingdom on fisheries management. The conference was sponsored by the Ditchley Foundation, which brings leading experts from around the world to discuss current public policy issues.

■

Richard Stroup and **Matthew Brown** are completing a study of the Miami Circle, a controversial archaeological site in Miami, for the James Madison Institute in Tallahassee, Florida. Says Brown: "When we learned that the developer who found this American Indian relic was going to be forced to stop his project, it occurred to us that the chilling effect of artifact protection laws was a lot like the chilling effect of the Endangered Species Act. This led us into a comprehensive study of archaeology today." Their paper, which will be published by the James Madison Institute, discusses ways in which markets can aid archaeological preservation.

Pierre Desrochers has been selected as the William S. Broadbent Fellow for 1999. This award, named for a former PERC trustee, goes to the PERC Fellow who has written the best paper during the year. Desrochers' subject was "Eco-Industrial Parks: The Case for Private Planning." **Richard Stroup** supervised his research while at PERC, and **Peter Boettke** of George Mason University initially recommended him. **Dan Benjamin** heads the fellowship program.

■

The executive committee of PERC's board of trustees held its annual midwinter meeting in February at the Hoover Institution, where executive director **Terry Anderson** is spending three months as a Senior Fellow. Board chairman **Kim Dennis** and trustees **David Cameron**, **Joseph Ignat, Jerry Perkins**, and **John Tomlin** attended, as did PERC treasurer **Monica Guenther** and development director **Eric Noyes**.

■

PERC has two new senior associates. **Andrew P. Morriss** is a professor of law and an associate professor of economics at Case Western University. In 1999 he spent a semester as a PERC Visiting Scholar. He became interested in the West by studying private governing institutions developed by miners in the nineteenth century. He is coeditor with **Roger Meiners** of the new Political Economy Forum book *The Common Law and the Environment* and has contributed to two PERC volumes. Morriss champions common law as a replacement for much of today's regulatory state. He received his J.D. and his master's in public affairs from the University of Texas at Austin and his Ph.D. in economics from the Massachusetts Institute of Technology.

David D. Haddock, a professor of law and economics at Northwestern University, teaches in both the law school and the economics department. He has a Ph.D. in economics from the University of Chicago. An E. L. Wiegand Adjunct Scholar with PERC in 1995–96, Haddock has contributed to three of the Political Economy Forum series of books edited by **Terry Anderson**. He writes about topics from insider trading to grain futures contracts and is especially interested in federalism as it applies to topics ranging from indigenous affairs to water markets.

letters to the editor

REACTIONS

502 S. 19th Avenue, Suite 211
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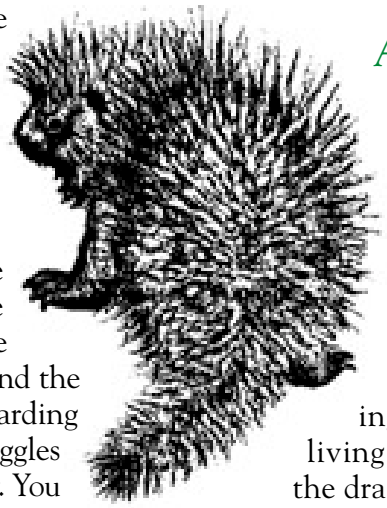
Understandable Confusion

I found Allan Fitzsimmons' article ("The Illusion of Ecosystem Management," December 1999) to be well thought out and would like to add some comments.

First, I would like to be charitable to those who have shifted government policy away from managing ecosystems for the well-being of humans to managing them for their own restoration, protection, and sustainability. The shift may reflect the concept that nature is no longer an adversary of man; now we are managers and not merely trying to survive in a hostile world. We seem to think that we have "conquered" nature and it is our responsibility to restore and sustain it.



Second, the confusion over the definition of "ecosystem" stems from the way science is hammered out. Someone comes up with a new concept or idea and the rest of us struggle with refining or discarding the concept. There have been great struggles over things that seem obvious to us now. You can't make gold out of lead. The earth is round not flat. The earth revolves around the sun. These debates take time to resolve.

As a classically trained geologist, I learned that the world and all its "ecosystems" are in a state of flux. Flux is what makes things happen. Real long-term "sustainability" of an ecosystem at a given longitude and latitude is a fallacy. The "ecosystem" of my current residence is drastically different from the "ecosystem" at this location during the Wisconsin Ice Age. I am in a constant battle to "sustain" my suburban St. Augustine lawn against barbarian hordes of wildflowers, grasses and weeds from the adjacent power line right-of-way (by the way, I'm losing). It is absurd to think that man can by government decree or any other method actually restore, sustain, and protect anything so nebulous as an "ecosystem" over any meaningful (or at least geologically meaningful) length of time.

Finally, who decided that the standard for "ecosystems" is pre-Columbian America? Were all the millions of buffalo of the past "better" than the millions of white-tailed deer now invading the suburbs?

Barry Chamberlain
Houston, Texas

A Mistaken Dichotomy

Fitzsimmons posits a dichotomy between human well-being and nature which is hardly characteristic of my region of the country, the Great Lakes, or ecosystem management in practice.

The Great Lakes Water Quality Agreement of 1978 defines the Great Lakes Basin ecosystem as "the interacting components of air, land, water, and living organisms, including *humans*, within the drainage. . . ." The agreement mimics the Clean Water Act in pledging the parties "to restore the chemical, physical, and biological integrity of the waters of the Great Lakes Basin ecosystem." This mobilized eight states, two provinces, both federal governments, and countless businesses and municipalities to achieve the greatest feat of ecological restoration in the world.

Ecosystems management is not a precise science. Practitioners instinctively recall Aristotle's caution not to seek greater certainty than the subject matter permits. Yet it can yield tremendous benefits if coupled with local support, sound science, and a comparative risk framework.

G. Tracy Mehan, III
Director, Office of the Great Lakes
State of Michigan

EXCERPT

OUT TO PASTURE . . . BUT WOW, WHAT A PASTURE

By Leigh Perkins

I have served on the board of an organization out in Bozeman, Montana, called PERC—the Political Economy Research Center. This is essentially a think tank with a number of bright young academics who are trying to promote free-market solutions to environmental problems. Many environmental problems can be solved by private-property owners because property rights have the potential for turning the environment into an asset.

For example, PERC promotes purchasing or leasing water rights to increase instream flows—this was the answer to the Henry's Fork crisis. [Henry's Fork, a tributary of the Snake River, used to be so dry at times that few trout could spawn. Through purchases of water and other guarantees, the Nature Conservancy, with Orvis's help, is working with irrigators to keep the water flowing.] PERC has been an important influence on the growing interest in the West in water trading to prevent streams from drying up and killing fish.

I have gotten a lot of satisfaction out of working with PERC (and not just because its annual board meeting is in September when both bird hunting and trout fishing in Montana are superb). Their ideas about free–market solutions to environmental problems match my own experiences. Without question, my best hunting and fishing days have come on private property where landowners have an incentive—either for profit or from personal ethics—to preserve the environment. As we move into the next century, the environmental movement will have to rely more and more on PERC-type solutions if we wish to conserve on precious natural resources.

From A Sportsman's Life: How I Built Orvis by Mixing Business and Sport *by Leigh Perkins with Geoffrey Norman (Atlantic Monthly Press, 1999). Leigh Perkins is a board member of PERC.*

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