Where Markets Meet the Environment

PERC REPORTS

Volume 18 Number 3 September 2000 502 South 19th Avenue, Suite 211, Bozeman, Montana 59718

CLEARING THE AIR

by Indur M. Goklany

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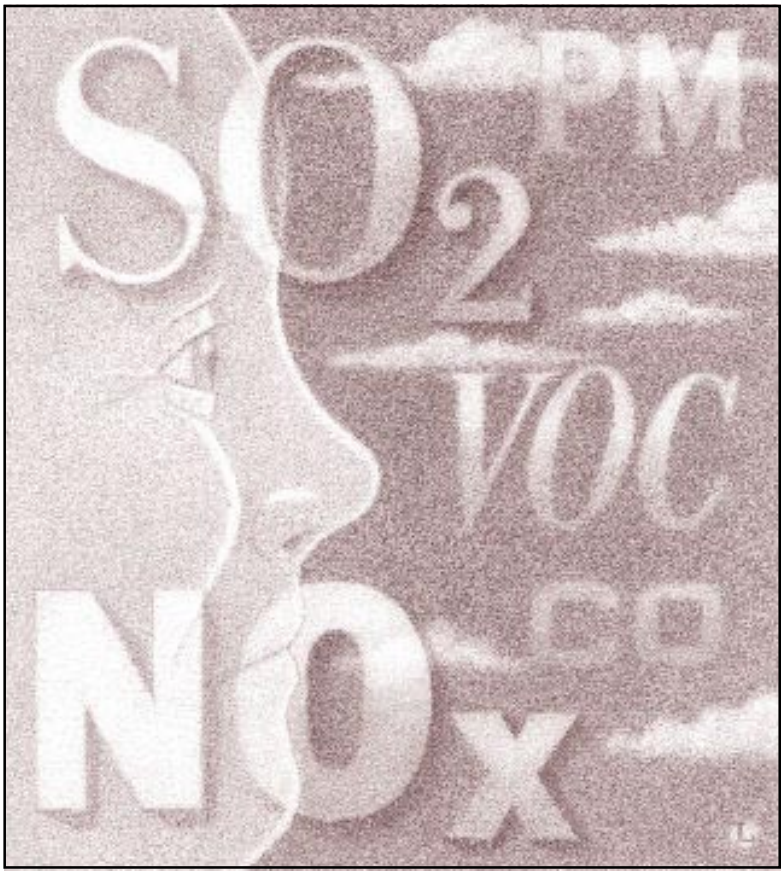

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ISSN 1095-3779

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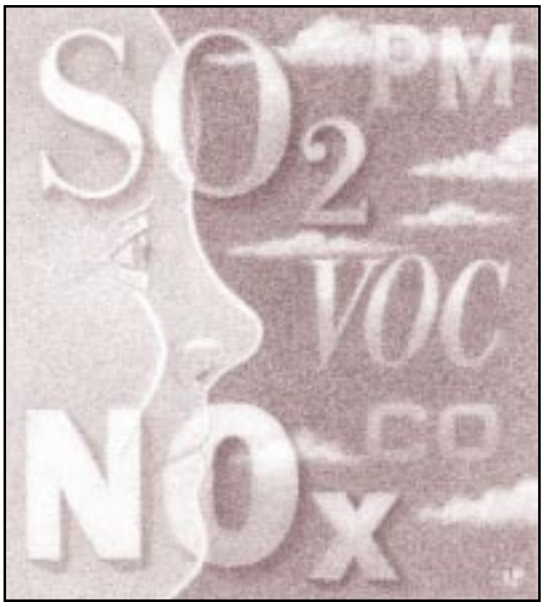
AIR QUALITY IMPROVED GRADUALLY OVER THE 20TH CENTURY

CLEARING THE AIR

By Indur M. Goklany

In recent years a spirited debate has been conducted in law journals over the reasons why the national government took over environmental regulation in the 1970s. The general issue is whether or not state governments were embarked on a "race to the bottom," deliberately sacrificing environmental quality, especially air quality, to snare more businesses and jobs. The debate is based largely upon theoretical arguments and economic models of firms' decisions to locate new factories under different states' environmental standards (see Revesz 1992; Dwyer 1995; Swire 1996).



Empirical data on air pollution can resolve the debate over whether state governments were embarked on a "race to the bottom."

As a scientist and engineer trained to base my arguments on data, I tend to avoid law review articles because of the authors' dogged disregard for empirical data. These articles on the history of air pollution fit the model. They make virtually no reference to empirical data on air quality or emissions estimates. Without such data, any conclusion logically arrived at is valid so long as it does not contravene any laws of nature. The writer is constrained only by his or her imagination in dreaming up "what-ifs."

Empirical data, however, will narrow any debate to the more likely premises and outcomes. Empirical data on air pollution can, in fact, resolve this particular debate.

Because I had worked on air pollution for both the State of Michigan and the Chicago regional office of the Environmental Protection Agency, the characterization of state agencies as indifferent to its citizens' desires for cleaner air struck me as oversimplified, if not false. Accordingly, several years ago I began a systematic compilation of air pollution data and trends going back as far as possible to determine whether they support the states' alleged ineffectiveness in curbing air pollution. Out of this effort came a book (Goklany 1999) that attempts to "clear the air" by bringing empirical data to bear on the veracity of these claims.

Three kinds of historical data tell the story: indoor air quality, outdoor air quality, and estimated emissions of pollutants per national output. Indoor air quality data were derived from 1940 through 1990 using, as a crude proxy, residential combustion emissions per occupied household using data from the EPA and the Bureau of the Census (see Goklany 1996). Outdoor air quality trends were developed by collecting, for each pollutant, data from EPA (or predecessor agencies') reports on air quality trends, Council on Environmental Quality's annual reports (Environmental Quality), and the *Statistical Abstracts of the United States*. Finally, the national emission estimates came from EPA's emissions trends report which provide data from 1900 onward for SO_2, VOC, and NO_x, and from 1940 for PM and CO.

CLEARING THE AIR

Indoor Air Quality. In the United States, we forget that indoor air quality, particularly in the home, is a far better indicator of the impact of air pollution on public health than is outdoor air quality. Studies indicate that 70 percent of the average person's time is spent indoors at home; another 23 percent of the time is spent indoors elsewhere (Environmental Protection Agency 1989). Worldwide, the World Health Organization (1997) estimates, 3 million people are killed each year by air pollution, 2.8 million of them due to indoor air pollution from the burning of coal, wood, and dung inside the home, mainly in developing countries.

Early in the twentieth century, the situation was not much better in the United States, where people used to cook and heat their homes with coal or wood. But as households became more prosperous, they began to invest in new technology such as gas, oil, and even electricity for heating and cooking. Between 1940 and 1990, indoor air quality, derived from EPA's own emissions estimates, improved by over 90 percent for particulate matter (PM, a measure of soot and smoke), carbon monoxide (CO), and sulfur dioxide (SO_2). More than 90 percent of these improvements occurred before 1970, i.e., before federalization.

Outdoor Air Quality. Contrary to myth, outdoor air quality also improved remarkably rapidly before 1970, particularly for the most-feared pollutants. These are the pollutants associated with the killer air pollution episodes of Donora, Pennsylvania in 1948 and London in 1952, namely, particulates and sulfur dioxide. The five-day London episode, for example, was associated with 4,000 deaths.

The improvements were especially pronounced in urban areas, which had the worst pollution problems. Particulate levels, which had been in decline at least since the 1940s, fell an additional 15 percent just between 1957 and 1970 (based upon data from 60 cities). Sulfur dioxide declined 40 percent between 1962 and 1969 (based upon 21 cities' data) (see chart). Similarly, smog—a problem first and foremost in the Los Angeles area—had been improving there since the 1950s.

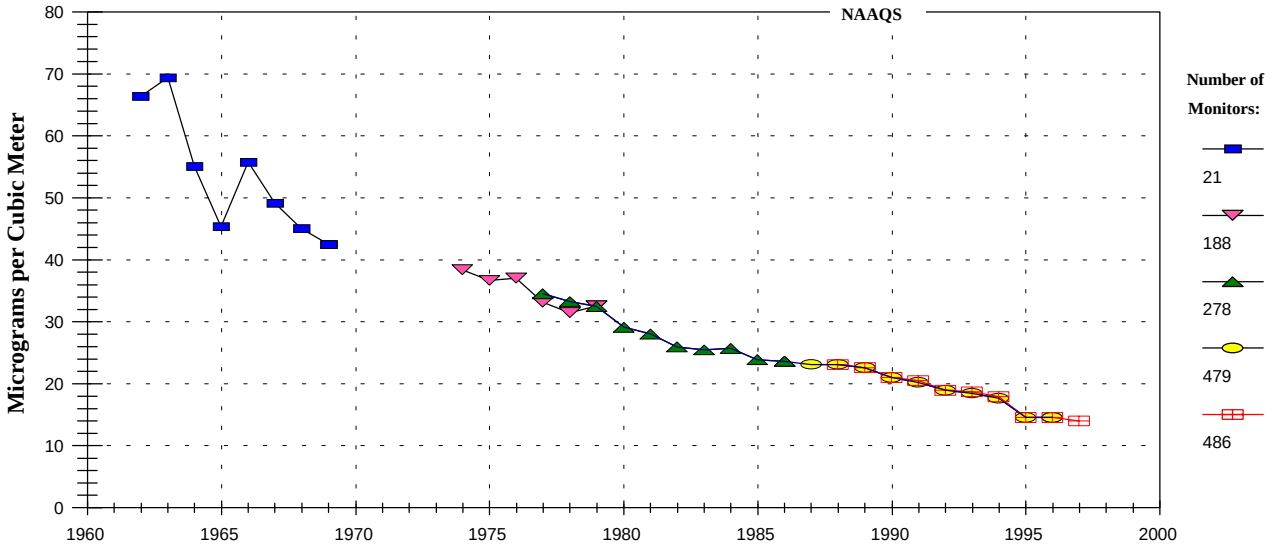
Emissions Data. Emissions of pollutants, when estimated per unit of national output, show a similar dramatic decline. For sulfur dioxide, emissions per GNP peaked in the 1920s. For volatile organic compounds and nitrogen oxides, the two major contributors to smog, the peak occurred in the 1930s. For particulates and carbon monoxide, the peak was in the 1940s or earlier.

At least seventy percent of the reductions between these peaks and the 1997 levels occurred before the national government took over (Goklany 1999). The first improvements came voluntarily when more prosperous households, businesses, and industries started switching to cleaner fuels and adopting more efficient technologies.

These data refute the claims of a theoretical race to the bottom as well as claims that the air was getting

AMBIENT SO_2 CONCENTRATIONS

Mean Annual Average, 1962–1997



Source: Goklany (1999).

worse in the period preceding national control. Furthermore, national regulatory control does not seem to have accelerated substantially (if at all) the declines in emissions or improvements in air quality for the most important pollutants. Even so, some still argue for federal control on the grounds that pollution can have interstate impacts. But thirty years of experience show that federal control does not guarantee successful or, for that matter, efficient solutions to interstate problems such as acid rain.

The rise and fall of air pollution during the twentieth century tracks well with the premise that people continually strive to improve their quality of life. In the early stages of economic development, society focuses on becoming wealthier so that it can better afford basic services such as sewage treatment, water supply, electricity, and hospitals. During this period, the environment suffers. Thus, initially the "race to the top of the quality of life" may look like a "race to the bottom" of environmental quality.

After a certain point, improving society's quality of life means devoting more resources to solving environmental problems. Thus, environmental degradation is first arrested and then reversed; society goes through an "environmental transition." After the transition, greater wealth and technology improve rather than worsen environmental quality, and the race to the top of the quality of life mirrors a "race to the top" of environmental quality.

There are several implications of these findings. Now that the United States is past its environmental transition, we are not likely to see any rollback of air quality if regulatory power is devolved to state governments.

Moreover, the easy—and many of the harder—air pollution problems have already been solved. To ensure that further improvements in environmental quality and the quality of life go hand in hand, environmental requirements should be fine-tuned to each state's special circumstances, something impossible with one-size-fits-all federal regulations.

The historical experience suggests that the federal government should enter into a partnership with states, and the current command-and-control, pollutant-by-pollutant approach should be replaced with one that would minimize overall risks to public health and welfare. Emissions trading should be broadened to allow trading across pollutants. Trading should encourage not just emission reductions but reductions in risks to health and welfare.

The federal government can set idealized goals but the states should determine their own schedules and control measures to attain those goals. This is appropriate since they will be the major winners or losers from their own actions (or inaction). Thus, downwind states should be free to accept alternative risk reductions if that would provide greater benefits. A state might prefer funding to provide some health insurance for its indigent instead of additional scrubbers upwind to reduce sulfur dioxide.

Optimizing the quality of life should be left to each state's political process. To echo Winston Churchill's statement about democracy, it may be the worst method, until you consider all the others.

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FREE MARKET POLICIES ARE INADEQUATE TO PROTECT THE ENVIRONMENT

EXCESSIVE CLAIMS FOR THE MARKET

By Peter Grosvenor

Free market environmentalists have improved the quality of environmental debate in several respects. Economic growth and environmental degradation are no longer equated. Economists such as Julian Simon have falsified the apocalyptic extrapolations of neo-Malthusians. In some cases, free market theory has also persuasively criticized overregulation and its unintended consequences.

Free market environmental theory relies on abstract economic reasoning from prior assumptions and is poorly grounded in real historical experience.

Despite these contributions, free market environmentalism has serious flaws. First, it relies on abstract economic reasoning from prior assumptions and is poorly grounded in real historical experience, as these examples indicate:

- In Britain at the height of the Industrial Revolution, unprecedented population densities required public provision of sanitation facilities. Every subsequent industrializing nation has replicated this process. It is a classic example of environmental protection as a public good, the provision of which Adam Smith himself recognized as a legitimate function of government.

- The "tragedy of the commons" posits that the depletion of resources held in common is inevitable. This ignores the fact that the commons operated successfully under customary regulation for many centuries, until they were destroyed—not by overgrazing but by the state-sanctioned coercion of the enclosure movement (McCoy and Acheson 1987; Thompson 1991).

A second problem with free market environmentalism is its frequent attachment to libertarianism and market fundamentalism. Libertarianism prioritizes a radically individualistic conception of freedom over all other political values and claims the market as the ultimate guarantor of this freedom.

Some of the excessive claims made on behalf of the market mirror the religiosity of the Greens. Steven Landsburg (1993, 73) comes close to imputing supernatural qualities to the market when he says, for example: "In biology, there is no equivalent of the Invisible Hand. . . . Nothing in evolutionary theory either promises or delivers the spectacular efficiency of the competitive marketplace."

The Greens' apocalyptic warnings also have a libertarian parallel in cornucopian naivete. The late Julian Simon (1998) jeopardized an otherwise useful argument when he implied that the world is underpopulated and that there can be no long-term negative consequences attached to population growth.

Indeed, market fundamentalists contend that if any market transaction is unimpeded, its outcome must be optimal and that any reduction in the scope of the market results in economic inefficiency and loss of personal freedom.

But such an ultra-individualist view will not find support even in the works of a market theorist, F. A. Hayek himself, who viewed some health and safety regulation as appropriate. "To prohibit the use of certain poisonous substances or to require special precautions in their use, to limit working hours or to require certain sanitary arrangements, is fully compatible with the preservation of competition," he wrote. "The only question here is whether in the particular instance the advantages gained are greater

than the social costs which they impose" (Hayek 1994, 43).

Hayek's sentiment is effectively indistinguishable from the views of a mixed economy advocate such as Robert Kuttner (1997, 304), who writes: "Advocates of a mixed economy do not insist that regulation always improves on markets—only that it sometimes improves on some markets, and that one must get down to cases."

There are both ethical and technical limits to the competency of the market. Ethically, all societies, past and present, have deemed whole spheres of life to be beyond the acceptable scope of markets. As philosopher Michael Walzer (1983, 9) has argued, "...the words prostitution and bribery, like simony, describe the sale and purchase of goods that, given certain understandings of their meaning, ought never to be sold or purchased." Limits on commercial intrusion into public parks is a contemporary example of appropriate restraints.

Consider now the technical limits. In some instances, markets are inadequate and require "command-and-control" regulation. Such regulation is not necessarily ineffective or counterproductive.

Hayek's sentiment on health and safety regulation is effectively indistinguishable from the views of a mixed economy advocate such as Robert Kuttner.

- Robert Gordon (1994) of the National Wilderness Institute, a fierce critic of the Endangered Species Act, argues that the act has contributed nothing to the recovery of the Arctic peregrine falcon and the bald eagle. Instead he credits the DDT ban—another case of "command-and-control" legislation.

- Economists Crandall and Graham (1989), working from a 1984 study that correlated car mass with occupant fatality, have claimed that fuel economy regulations increased fatalities because auto manufacturers reduced vehicle weight and therefore safety. But their study ignores the law of substitution (Kuttner 1997, 305–308). The notion that auto manufacturers compromise safety to comply with fuel efficiency regulations reflects a level of cynicism about business motivation more commonly found on the Marxist left. In practice, regulation has provided incentives for innovation, resulting in cars that are lighter, more fuel efficient, and safer.

In the case of fuel efficiency, "command-and-control" regulation has had net benefits that would not have resulted from either the free market or a lighter regulatory regime. For example, some economists have proposed the more market-based mechanism of gasoline taxes to reduce fuel use. Taxes have been used to good effect in Europe, where a highly developed infrastructure of public transportation provides an alternative. In the United States, by contrast, gasoline taxes would allow the wealthy to consume fuel at their previous rate, while exacerbating financial pressures on the poor, results acceptable only to ideologues who insist that market outcomes by definition constitute distributive justice.

Having said this, the efficiency of the free market does justify a presumption against regulation, and where regulation is necessary, it should be as market-based as possible. The 1990 introduction of tradable emission rights created a decentralized regulatory regime under which a reduction in emissions would profit the polluter by freeing emission rights for sale.

The historical record demonstrates that, left entirely to its own devices, the free market results in pollution, hazardous working conditions, and dangerous products. Societies use the political process to set environmental minima. The view that the free market will always produce optimal environmental outcomes represents a triumph of libertarian ideology over historical experience.

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RESPONSE

THE MERITS OF MARKET SOLUTIONS

By Richard L. Stroup

I appreciate Peter Grosvenor's grudging acknowledgment that seeking market solutions to environmental problems has some merit. Right now, though, he still caricatures free market environmentalism as an absolutist position opposed to any regulation at all. The truth is that free market environmentalists know that the market does not always have a ready solution today. The voluntary solution may not exist; it may not yet have been recognized; or it may yet be discovered.

"One must get down to cases" in deciding when and where markets are better than regulation. On this we agree.

Grosvenor points to the early public provision of sanitation facilities in England as an example of constructive government action. The reason that government could act constructively, and its action may even have been necessary, is that Britain's cities were already hundreds or thousands of years old. Perception of the importance of sanitation facilities occurred late in their history.

Once the importance of sewage collection and treatment was recognized, getting the building owners to pay for such a system surely required regulation. And public provision may even have been cheaper.

In contrast, today towns and cities are being built with full knowledge of the critical role of sanitation facilities. There is little inherent reason today for city or town builders to rely on public provision of facilities such as sewage treatment, water supply, and trash disposal. While many cities still rely on government to provide these services, others do not.

Free market environmentalists recognize that there is a role for regulation today when there are many polluters and victims. That was the case in nineteenth-century London and it is the case today in the Los Angeles basin, where millions of cars contribute pollution affecting millions of victims, many of whom are the same people. In such cases, government regulation is appropriate, and programs that minimize regulation costs (such as trading of emissions rights, which Grosvenor applauds) offer an advantage over traditional command and control.

But when one or a few polluters can be sued directly by the property owners harmed, regulation is almost surely inferior. For example, addressing the effects of effluent from hazardous waste dumps through a cumbersome regulatory scheme such as Superfund was a mistake. Court cases have in the past resolved such problems and could have done so in the future.

As Grosvenor says (quoting Kuttner) "one must get down to cases" in deciding when and where markets are better than regulation. On this we agree.

A major tenet of economics is that there is no free lunch. Any broad course of action entails costs or

disadvantages. I believe that Grosvenor mischaracterizes the late Julian Simon when he claims that Simon saw "no negative consequences" attached to population growth. While Simon can no longer defend himself, I would argue the following: In the short run, more children will surely place a larger burden on a family. However, as Simon argued, population growth with appropriate institutions—rules and customs that give individuals freedom to innovate as well as accountability for the results of personal actions—is consistent with improved human welfare over time.

The latest support for that claim is the Economic Freedom of the World Index, which identifies the level of economic freedom in most countries of the world. This index measures the extent to which markets (rather than governments) control each nation's economy. Market dominance is positively correlated with incomes (Gwartney and Lawson 2000), human health, and available environmental measures (Norton 1998). The role of the market is far more important in determining economic prosperity than is population (Kelley 1988). Markets are imperfect, but where markets are allowed to work, they generally provide superior results over government control.

Grosvenor claims that some values are "beyond the acceptable scope of the market." In Grosvenor's view, these range from bribery and prostitution to charging people to enter a publicly owned park. Rather than lumping such varied items together, we should look more analytically at the issue.

Whenever a society has chosen to make an act illegal—murder or theft, for example—then it has placed the act beyond a legitimate market. But parks are not illegal. Thus we do not view parks as "beyond the acceptable scope of the market."

Indeed, private parks, both for profit and not-for-profit, both please consumers and protect environmental qualities. Whether governmental operation of parks is superior is the kind of "down to cases" example that Kuttner would have us investigate. And we have.

Research at PERC suggests that parks, private and public, that rely on market forces—visitor fees and voluntary donations—more than on tax funding, serve visitors better and protect their natural resources more effectively (Leal and Fretwell 1997).

Grosvenor urgently wants to believe that regulation is effective. He wants to believe that fuel efficiency standards are "good" regulation, although automakers met them by making their cars lighter and—according to a scientific study—less safe (this may have been their only option if they wanted to stay in business).

Grosvenor ignores the fact that direct regulation is almost always tailored to the rich at the expense of poorer citizens. All cars in the United States are required, for example, to have substantial safety equipment such as air bags. These are options that the wealthy previously purchased voluntarily. Now everyone must buy them. By spreading them across all cars sold in the country, regulation reduces production and installation costs, making them cheaper for the rich than they otherwise would be. Yet they still cost more than many people can easily pay. One unfortunate result is that poor people often drive older cars because they are cheaper. These cars well be *less safe* than cars with the newest safety devices.

Finally, Grosvenor errs when he assumes that free market environmentalists ignore the historical role that custom and tradition have played in guarding against overexploitation. PERC associates have explored this subject in several publications and I commend them to Grosvenor for further reading (Anderson and Simmons 1993; Leal 1996).

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GREENER PASTURES

PRIVATE INITIATIVES

By Linda E. Platts

TWO FOR ONE

Georgia catfish farmers are homing in on a new cash crop that will allow them to operate two businesses for the price of one, almost. It will also help them meet Georgia clean water standards for discharges from their fish tanks.

Catfish thrive on pellet food that is rich in nitrogen, phosphorous, and protein. In a large tank, the fish absorb only about half the nutrients, and the rest is left as waste in the water. This nutrient-rich water happens to be perfect for hydroponic agriculture. Already, many catfish farmers are using the filtered wastewater to raise lettuce. But far easier to grow than vegetables are algae. They are also more profitable.

Hematococcus is a type of algae used to make beta carotene, Vitamin A, antibiotics, and pigments that give salmon meat its appealing pink color. These pigments currently sell for about $1,000 per pound or significantly more than the going price of lettuce. The algae grows copiously in the catfish wastewater and at the same time removes many of the problematic nutrients from the water.

Finding a profitable way to clean up their fish tank water may prove to be a boon for both the farmers and Georgia's water quality.

—Associated Press

MONKEY BUSINESS

The chattering, white-faced Mono Ti Ti monkey is rapidly disappearing from its jungle habitat along Costa Rica's Pacific coast. Development, farming, and tourism have destroyed large chunks of its already circumscribed habitat, and the population has fallen from 5,000 to less than 1,000 during the past 30 years.

Stepping up to the challenge, a well-known eco-resort developer is raising awareness of the monkey's plight and hopes to save it from extinction. Jim Damalas left UCLA for Costa Rica's beaches more than 25 years ago. He became deeply involved in building an eco-friendly resort, preserving the environment, and promoting environmentally friendly tourism practices among other Costa Rican hoteliers.

Damalas also pursued a successful career as a Hollywood art director and props manager. His two worlds have converged at his Si Como No resort, a popular getaway for Hollywood insiders.

At local elementary schools, Damalas promoted a program that included instruction from a naturalist about the Ti Ti monkey and threats to its existence, as well as an art contest where the children illustrated their ideas for saving the monkey. Winning pictures were printed on calendars and T-shirts, which he sold at his hotel. The proceeds were returned to the schools for more programs. The original artwork was sold at a star-studded Hollywood auction, and the proceeds will fund a foundation dedicated to saving the Ti Ti.

—Environmental News Network

FARMING OUR PARKS

Federal land management agencies are increasingly receptive to innovative partnerships that can help share the burden of managing millions of acres of public land. In the case of Ohio's Cuyahoga Valley National Recreation Area, farmers are being sought to run about 35 small family farms.

The legislation that created the 33,000-acre national park 25 years ago stipulated that the area would be preserved for its historic, scenic, natural and recreational values. Restoring the valley's agricultural landscape is one way to meet these goals.

Previous efforts failed because the National Park Service offered only one- to three-year-leases, and many of the tenants lacked farming experience. The new program benefits from the experiences of the past. New leases will run for 50 years, and applicants must submit their credentials along with a proposal for how they intend to use the land. In addition, park officials have formed the Cuyahoga Countryside Conservancy, which will provide technical assistance and recruit qualified farmers.

Certain restrictions go with the leases, including raising livestock and crops that are important to the traditions of the region. And because of the high visibility of the farms, the tenants must also be skilled at dealing with the public.

Ultimately, all parties should benefit. Eager farmers will have access to homesteads for long periods of time, the Park Service will collect rent, and visitors, most of whom come from nearby Cleveland and Akron, will have the pleasure of seeing a beautiful valley inhabited by working farms.

—Cleveland Plain Dealer

BYE BYE BLACKTOP

The demand for parking spaces could not keep pace with supply at fast-growing Dominican University in River Forest, Ill. School administrators were faced with paving over more lawns and in the process taking out 25 to 30 mature shade trees.

An alternative presented itself in the form of an earth-toned gravel parking lot called Gravelpave2, a system invented by Invisible Structures of Colorado. By ripping out the existing asphalt and applying the new surface material, the local contractor promised to expand parking by 20 percent without removing any trees.

The new parking lot was built in layers. First gravel was spread and covered with a water-permeable sheet that unrolls like carpet. The sheet is honeycombed with molded plastic rings that keep the gravel in place and prevent ruts from forming. A finer layer of gravel was then applied on top.

The gravel surface allows water to permeate the soil and prevents runoff, thus avoiding the cost of a drainage system and lightening the burden on local storm sewers. The permeable surface also allows rain to reach tree roots, preserving the campus trees.

The lot is low-maintenance and even damaged areas can be easily repaired without the unsightly patching that is common with asphalt. Despite the added initial cost of about 20 percent, Amy McCormack, who is in charge of the school's business affairs, definitely prefers the gravel. She has gone on record calling it more beautiful than any parking surface she has ever seen.

—Chicago Sun-Times

WANTED: GOAT HERDERS

The fires that scorched millions of acres across the West this summer have left many people wondering how to prevent further devastation in summers to come. Logging, thinning, herbicides, and prescribed burns are all possibilities; however, the discussions involving these methods are often as heated as the fires themselves. Cooler heads prevail when the talk turns to goats and sheep as a way to reduce fire danger.

A flock of these hungry ungulates can turn an impassable thicket into an open glen in a matter of just one day. They will eat anything from grasses and thorn bushes to poison oak and small trees. Sheep are being used routinely to clear grasses and vines, while goats are chomping down low-hanging branches and intermediate growth. All of this hearty eating reduces the fire ladder by which flames travel from grasses to trees and then into the forest canopy.

With sheep and goats, the key to success is controlled grazing. The animals are contained in a designated area by a solar-charged, portable electric fence. The grazing time and the number of animals used varies, depending on the vegetation. In some areas, brush control can be achieved with 300 sheep on a single acre for one day.

Livestock growers are finding that herds for hire can be a reliable source of income. In northern California, Ann Pieschel, who owns Goats Unlimited, has all the work she can handle. She has contracts with private landowners, farmers, vineyard owners, and even some municipalities. The California office of the National Audubon Society is considering using goats to control invasive weeds on some of its preserves.

In the Stanislaus National Forest, the Forest Service is experimenting with goats to determine if they can be an ecologically benign way to reduce fire hazards. The agency is particularly interested in their use near communities and private property in order to avoid the inherent risks of prescribed fires.

—New York Times

GOVERNMENT MANAGEMENT OF FISHERIES IS A FAILURE

HOMESTEADING THE OCEANS

By Donald R. Leal

Government control has been the primary tool for managing ocean fishing. But regulators ignore economic factors and encourage overcapitalization.

Nearly twenty-five years have elapsed since the United States government extended federal control over ocean fishing from 12 miles to 200 miles from its shores, primarily to eliminate foreign fishing pressure on declining fish stocks. Unfortunately, federal control has not eliminated overfishing.

A 1999 report to Congress by the U.S. Department of Commerce's National Marine Fisheries Service listed 98 species as overfished—that is, experiencing fewer or smaller fish each year because of too much fishing—with another five species approaching an overfished condition. For 674 species, or 75 percent of all species it assessed, the agency does not know if they are overfished or not (NMFS 1999).

Ocean fisheries provide the classic case of the "tragedy of the commons,"[1] in which lack of ownership of jointly exploited fish stocks often leads to depletion of the stocks.[2]

In a commons situation, entering the fishing grounds first and capturing the fish fastest is a compelling strategy. This is when search and capture costs are the lowest. Each fisher is motivated to invest in equipment (e.g., faster boats and better detection devices) that improve the chances of winning the race for the fish—equipment that would not be necessary if the fishery were not under the strain of such competition. Not only do the stocks decline, but fishing becomes wastefully expensive as too many fishers invest in too much capital to catch too few fish.

Economist Frederick Bell was one of the first to verify empirically the overexploitation of a commons fishery open to all. Studying New England's northern lobster fishery in 1966, he found that an efficient output of lobster would have occurred at 17.2 million pounds. To attain this output, the efficient number of lobster traps would have been 433,000. However, during 1966 Bell found that fishers employed too much capital—891,000 traps—to harvest too many lobsters—25 million pounds (Bell 1972, 156).

Government regulation has been the primary tool for ending the tragedy of the commons. However, because government regulators do not own the resource, they typically ignore the economic factors that a private resource owner must consider in order to sustain maximum profits year after year—the situation that reflects the best use to society of the resource.

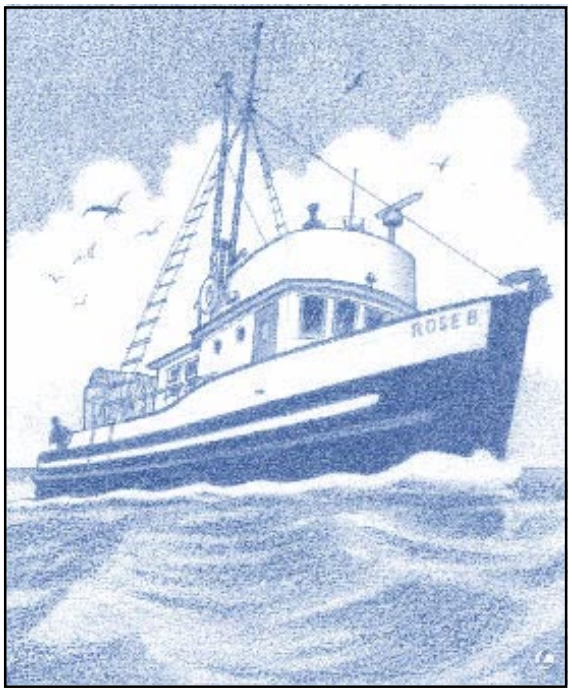
Regulations have led to enormous waste. The Pacific salmon fishery provides a classic example. Early in the twentieth century regulators prohibited the use of fish traps such as rock or pole barricades used to trap salmon in tidal waters (Allen and Charles 1992, 67). Such devices had been perfected by Indians, who once held exclusive fishing rights to sites along the rivers of the Northwest where the fish returned from the ocean to spawn. They were careful to allow escapement for future production. With traps eliminated, chasing salmon in the oceans commons became the dominant form of harvest. Fishers began to use very expensive, sophisticated equipment—equipment that became so effective that salmon were overexploited.

Facing reduced salmon numbers, regulators restricted the number of fishermen and the length of the season. So entrepreneurial fishers bought still bigger boats, better detection equipment, and more efficient nets. To plug these loopholes, regulators established other layers of regulations. The salmon catch was ultimately controlled, but the approach was wasteful, as more labor and capital were applied to

catch fewer fish. Fishers were forced to fish longer in less productive areas with more expensive equipment (Crutchfield and Pontecorvo 1969).

In addition to overcapitalization, the regulatory process spurred sometimes absurd restrictions. For example, Maryland oystermen at one time could use dredges but had to tow them behind sailboats on all but two days of the week, when motorized boats were allowed (Christy and Scott 1965, 15–16). In some Alaskan fisheries, fishing boats were limited to 50 feet in length (Crutchfield and Pontecorvo 1969, 46).

The Magnuson Fishery Conservation and Management Act of 1976 was supposed to correct these problems. The law set the stage for the removal of foreign fishing fleets and the development of domestic fisheries. Foreign fishing had been blamed for overfishing, so the act at least addressed this problem. As for the domestic fishing sector, the act created eight regional councils with the authority to "establish a system for limiting access to the fishery in order to achieve optimum yield." Optimum yield in this case was expected to take into account economic variables, such as interest rates, fish values, and the cost of alternative technologies.



The Magnuson legislation eliminated uncontrolled foreign fishing out to 200 miles from U.S. shores and called for economic considerations in regulatory policy. However, major problems remain. The legislation encouraged licensing entrants to limit the number of fishers or vessels in a fishery, but limiting entrants does not stop the race for the fish. A few powerful fishing vessels can do in a few minutes what used to take days.

Nor has the act improved the government's ability to assess stock conditions in a timely fashion. In 1998, for example, the Marine Fisheries Service reported to Congress that the majority of groundfish species off Washington, Oregon, and California were not overfished and were not even approaching an overfished condition (NMFS 1998). A year later, the Department of Commerce on behalf of NMFS declared the Pacific groundfish fishery a "disaster" due to overfishing. It appears that the agency had used three-year-old data to make its 1998 stock assessments of Pacific Coast groundfish (General Accounting Office 2000, 10). For its 1999 assessment the agency used more recent information and found that stocks had been severely depleted.

Given the long history of regulatory failure and growing fishing pressures, it is time to consider policy alternatives based on property rights. One approach gaining acceptance is to establish individual transferable quotas (ITQs), which guarantee each fisher a specific share of the total allowable catch before the season begins. Another is to establish full-fledged property rights either to fishing areas or to the fish themselves. The more secure the property rights, the healthier fish populations and fishing communities will be.

Notes

1. The term "tragedy of the commons" was taken from Garrett Hardin's influential article. See Hardin (1968).

2. Community-run, coastal fisheries are an exception to open access. See Leal (1996).

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Donald R. Leal is a Senior Associate of PERC. This essay is excerpted from "Homesteading the Oceans: The Case for Property Rights in U.S. Fisheries," PERC Policy Series PS-19, available from PERC or in PDF format at www.perc.org.

IN HONOR OF JULIAN SIMON

With Julian Simon's untimely death in 1998, free market environmentalism lost one of its most productive scholars. Starting with a revolutionary 1980 article in *Science* that exploded the myth of resource depletion and throughout a career that produced numerous provocative books, Simon successfully challenged conventional wisdom about resource scarcity and population growth. His optimistic findings have had an important role in convincing people that markets encourage environmental protection.

This year, PERC established the Julian Simon Fellowship, which brings scholars to PERC for several months to conduct research in the tradition of the path-breaking economist. In 2000, we have two Julian Simon Fellows. The Julian Simon Fellowships are sponsored by the D & D Foundation and by Wayne Nordberg.

Indur (Goks) Goklany, who wrote the cover article in this issue of *PERC Reports*, is researching the role of economic growth and technological change in improving human and environmental well-being. He received his Ph.D. in electrical engineering from Michigan State University and has spent more than twenty-five years addressing environmental and natural resource policy issues.

Goklany worked on air pollution control strategies while at the Chicago regional office of the Environmental Protection Agency. He was chief of the Technical Assessment Division of the National Commission on Air Quality and later helped develop the EPA's first new-source emissions trade, for which he was awarded an EPA bronze medal. In the mid-1980s he helped craft the EPA's emissions trading policy statement. At the Department of the Interior's Office of Policy Analysis, he dealt with global climate change and acid rain. Most recently, he wrote *Clearing the Air: The Real Story of the War on Air Pollution* (Cato, 1999).

Roger Sedjo is studying the changing role of the U.S. Forest Service. Sedjo, who received his Ph.D. in economics from the University of Washington, is a Senior Fellow at Resources for the Future (RFF) in Washington, D.C. Since 1977 he has directed RFF's Forest Economics and Policy Program, which conducts policy research affecting forests.

Sedjo has taught economics at Utah State University. He was a technical advisor to the Economic Planning Board of the Republic of Korea and served with the Department of State's Asia Bureau evaluating programs of the Agency for International Development. He became acquainted with Julian Simon when he and the late Marion Clawson contributed a chapter on the world's forests to *The Resourceful Earth*, edited by Simon and Herman Kahn. Sedjo is editor of a number of books on forestry including the forthcoming *A Vision of the Forest*. He is a coauthor of *Sustainability in Temperate Forests* (RFF, 1998) and *Global Forests: Issues for Six Billion People* (McGraw-Hill, 1991), among others.

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

The Endangered Species Act of 1973 (ESA) mandates that species protection be based on "scientific" criteria, not on political or economic grounds. Yet as anyone who has worked in Washington, D.C., can attest, laws are not administered in a vacuum. Research by Amy Whritenour Ando (1999) confirms that—despite the law's mandate—both economic and political factors are given considerable weight in decisions to list species as endangered or threatened.

The process of listing a species under the ESA is often both controversial and economically important. Listing the spotted owl, for example, ultimately ended logging on millions of acres of forests in the Northwest. Arguably, the listing of a species imposes both benefits and costs on members of the public, and both are usually greater the sooner the species is listed. Thus, persons who will be affected by a listing have incentives to alter the likelihood that listing will occur and to change the amount of time it takes for a given listing to occur.

Despite the law's mandate, both economic and political factors are given considerable weight in decisions to list species as endangered or threatened.

Groups seeking to influence U.S. Fish and Wildlife Service decisions can submit petitions and comments about a listing and ask congressional representatives to intervene. Ando studied both processes. Not all members of Congress are equally able to influence the Fish and Wildlife Service, and Ando focuses on legislators who sit on ESA's reauthorizing subcommittees, because they are likely to have more power over the Service.

Although there are technically several stages in the ESA process, Ando's study focuses on the two stages that appear to be the most important in determining the duration and outcome of a listing decision. During Ando's study period—the early 1990s—it took species about 2.3 years on average to pass through the initial ("category 1") period, and an added 1.3 years to go through the second stage, the proposal period. But there was enormous variation around these means: from 1 day up to nearly six years for the category 1 period and from five months to more than three years for the proposal period.

Ando finds that three key factors influence the length of time it takes a species to move through the category 1 period, as well as the probability that it will get through at all. First, if groups or individuals petition in favor of a listing and provide new information about the status of the species in question, then progress is more likely to occur, and that progress is likely to be faster.

Second, the political stance of the subcommittee members in whose jurisdiction the species is located is important. Ando defines a "pro-environment" member as one who has a League of Conservation Voters (LCV) rating of 75 or above, and a "pro-land-use" member as one with an LCV rating of 25 or less. Working with these definitions, Ando finds that if the member has a generally pro-environment voting record, movement through category 1 is more likely and faster. If the subcommittee

member's record is pro-land-use, movement is less likely and will be delayed even if it occurs.

Finally, Ando finds that Fish and Wildlife's priority index also has an effect. This index is designed to summarize both the degree of threat to the species and its taxonomic distinctiveness, and it is avowedly "scientific" in its construction. Species with higher Fish and Wildlife priorities are more likely to reach the proposal stage and to get there more quickly.

During the second key phase, the proposal period, a slightly different set of forces takes precedence. For example, having formal hearings on a species delays its progress, although the effect is small—six weeks. In addition, the emergence of *any* opposition to a listing is important: The filing of only one comment against, for example, is sufficient to delay the listing process more than three months.

Overall, at low levels of pressure—say, 200 or so comments for and against listing a species—opposition tends to dominate support, resulting in listing delays among those species who had made it to the proposal period. When controversy is greatest, however—with 1000 or more petitions supporting and opposing—support for listing overwhelms opposition. This means that controversial species are likely to achieve endangered status the fastest.

Like many public policy studies, the results of this one are of the "good news," "bad news" variety. The bad news is that a process that is supposed to be purely scientific and above partisan politics appears to be subject to the same sorts of political pressure that drive other regulatory processes. Powerful legislators can influence the bureaucracy to move in ways that suit their interests. The good news is that despite Congress's admonition against taking into account the costs and benefits of a listing, proponents and opponents of a decision are able to make their voices heard by the Fish and Wildlife Service. Whether the resulting decisions reflect any sensible balancing of these costs and benefits remains a question as yet unanswered.

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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

PERC's graduate fellowship program under the direction of **Daniel Benjamin** brings nearly a dozen young people to PERC each year for several months. Last spring, **Michael J. Meleady**, who is pursuing his master's degree in agricultural and resource economics at West Virginia University, investigated environmental justice concerns in Texas. **Randy Rucker**, professor of economics at Montana State University, supervised his research.

This summer, **Amanda Thimmes** studied water marketing to enhance instream flows, working with PERC Research Associate **Clay Landry**. Thimmes is pursuing a master's degree at Utah State University in public policy and administration and a certificate in natural resource and environmental policy. **Stuart Whitten**, a Ph.D. candidate at the University of New South Wales in Canberra, Australia, came to the United States through a Land and Water Resources Research and Development Corporation Travel Fellowship. He spent several months at PERC working with **Richard Stroup** studying the impact of institutions and incentives on private wetland conservation.

Mark Carey, a Ph.D. student in Latin American and environmental history at the University of California-Davis, is studying natural resource management among Nicaragua's Mayangna Indians (he was

a Fulbright Scholar in Nicaragua last year). Carey is working with **P. J. Hill**.

■

Many visitors stopped by this summer. From Germany, **Manfred Hoke, Claudia Ehrenstein**, and **Wilfried Voigt,** in the West on a State Department tour to learn about environmental issues, spoke with **Eric Noyes, Jane Shaw**, and **Richard Stroup**. Students from the Florida Gulf Coast University, taking a course organized by economist **Bradley Hobbs**, engaged in lively discussion with **P. J. Hill, Clay Landry**, and **Jane Shaw**. **Allan Fitzsimmons**, author of *Defending Illusions: Federal Protection of Ecosystems*, criticized ecosystem management at a luncheon talk in Bozeman.

■

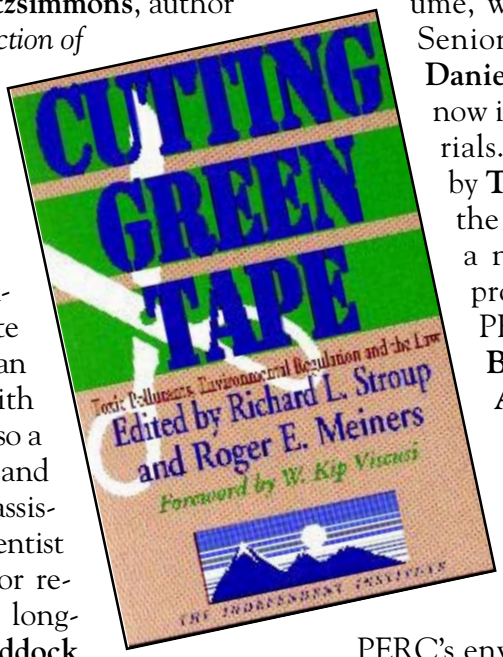
Nico Ochmann, a graduate student in economics at Montana State University this fall, came to Bozeman early to assist PERC associates with their research. **Debra Jacobs** was also a research assistant this summer, and **Anna Nordberg** was an editorial assistant. **Chris Fastnow**, a political scientist at Chatham College, joined us for research. And we welcomed many longtime friends, including **David Haddock**, **David Brady**, **Wayne Nordberg**, **Bill** and **Kim Dennis**, **Tom Bray**, as well as our senior associates, including **Bruce Yandle** and those who spend the summer here, **Daniel Benjamin**, **P. J. Hill**, and **Roger Meiners**. For information about our Julian Simon Fellows, **Indur Goklany** and **Roger Sedjo**, see p. 14.

■

In July, research associate **Holly Lippke Fretwell** gave a seminar for congressional staffers in Washington, D.C., on federal land management. **David Gerard** testified on mining before Congress in June. **Clay Landry** and **Terry Anderson** organized a seminar on water marketing in London. This innovative seminar was supported by the Sand County Foundation's Bradley Fund for the Environment and hosted by the Institute of Economic Affairs. **Don Leal** spoke on forest mismanagement at the Wise Use Leadership Conference in Las Vegas. **Eric Noyes** addressed the National Cattlemen's Beef Association in Denver. **Bishop Grewell** attended a seminar of the Institute for Humane Studies and **Matthew Brown** attended a seminar on Austrian economics sponsored by the Foundation for Economic Education (FEE). **Clay Landry** took part in a conference in Zurich sponsored by the American Swiss Foundation.

■

Cutting Green Tape, edited by PERC Senior Associates **Roger E. Meiners** and **Richard L. Stroup**, has been published by Transaction Press. This volume, which includes chapters by PERC Senior Associates **David Haddock** and **Daniel Benjamin**, discusses the liability now incurred by producers of toxic materials. *Political Environmentalism*, edited by **Terry L. Anderson** and published by the Hoover Institution Press, critiques a number of federal environmental programs. Chapter authors include PERC associates **Daniel Benjamin**, **Bruce Yandle**, **David Gerard**, and **Andrew Morriss**.



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Other activities of the summer included teacher workshops supervised by **Donald Wentworth**, PERC's environmental education director, in connection with the Foundation for Teaching Economics (FTE); PERC's annual seminar for college students; and a Liberty Fund colloquium for young scholars directed by **Daniel Benjamin**. This spring we held a Liberty Fund conference for business executives, directed by **Jane Shaw**, and a conference on "Smart Growth" for journalists, directed by Jane Shaw and **Ronald Utt** of the Heritage Foundation.

■

The James Madison Institute in Tallahassee, Florida, has issued a provocative paper on archaeological preservation written by PERC associates **Richard L. Stroup** and **Matthew Brown**. Stemming from the 1998 discovery of an American Indian stone circle in Miami, the paper builds a case for a legitimate market in antiquities. The paper is available from JMI (850-386-3131) and can be found on PERC's Web site (**www.perc.org**).

letters to the editor

REACTIONS

502 S. 19th Avenue, Suite 211
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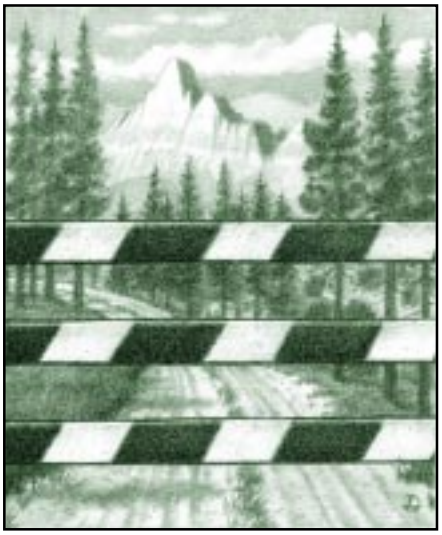
Be Conservative: Stop Building Roads

I usually read *PERC Reports* to force me to see new ways of accomplishing protection of the environment. This stimulus is provided by the economic perspective you sometimes bring to many problems. However, in Shannon Fitzsimmons' article ("End of the Road," June 2000), the "P" in your name, which stands for "political," is peaking through a disappearing veneer of economics. Let's look briefly at some facts (something I would have expected of PERC).



The Forest Service has approximately 400,000 miles of existing roads and an $8.5 billion maintenance backlog. We cannot take care of the roads we already have.

Some 600 American communities depend upon national forest roadless areas for their watersheds. Road building contributes to sedimentation and watershed degradation. The conservative approach is to err on the side of caution. Any risk of detriment to our watersheds must be avoided.

Road building fragments wildlife habitat and facilitates poaching. Here in New Mexico, wildlife is the foundation of a booming industry. The largest outfitting business in the United States supports roadless area protection because it protects the firm's economic base. There is also considerable evidence that roads into our forest are like hypodermic needles injecting invasive plant species that can wreak havoc upon ecosystems.

More roads do not increase the recreational quality of our forests. That is why nearly every major outdoor recreation council—except those funded by Japanese off-road-vehicle manufacturers—have endorsed the roadless policy.

GOP pollster Linda DiVall reports that Republicans by 2-to-1 support the proposed roadless protections. Forest Service road building has been a bad deal for taxpayers and an even worse bargain for the environment. It is time to put an end to the waste, regardless of who gets the credit.

James R. Scarantino
Executive Director
REP America

REP America is a national organization of Republicans interested in environmental protection.

Shannon Fitzsimmons responds:

My article did not explore the merits of road building but rather the way decisions about road building are made. Until now, such decisions were made by managers of individual national forests as part of the forest planning process. Elevating them to the national level, without congressional approval, disenfranchises the communities and local businesses for whom you express sympathy and perpetuates the "one-size-fits-all" errors of centralized decisions.

Off on a Tangent with Airplane Noise?

Having appraised over one hundred residential and commercial properties affected by airport noise, I have no quarrel with Daniel K. Benjamin's mathematics or his conclusion that the federal program is inefficient ("Tangents," June 2000). However, his assumptions about human character do not reflect the real estate markets or human beings I know, and his

recommendations are not consistent with Constitutional principles. I can illustrate using three passages.

- "Noise lovers congregate not only at rock concerts; they also live in major flight paths, relatively unconcerned with the roar of passing jets."

While I don't like heavy metal, rap, and ear-blasting concerts, to their fans they are music, not noise, worlds apart. To assume that all who live in noisy areas are "noise lovers" is, of course, like saying all people who live in the inner cities are gang warfare lovers.

- "An economically sensible policy would have hit airplane noise with taxes as great as the damage done to nearby homeowners."

What kind of justice is done when the government would collect the taxes, while the homeowners would suffer the damage? This might even be an incentive for government to encourage more damage! By these lights, why not have the government collect a mine tragedy tax rather than have the company compensate miners for deaths in an explosion?

- The conclusion: "Free to choose, individual market participants would have almost completely eliminated the potential net losses from airport noise pollution."

Net loss to whom? Yes, many who find themselves under a noisy flight path will move out and others will move in, but rather than being noise lovers, they are bargain hunters. Where the noise is a new phenomenon (due to a new airport or runway), property values will fall. Those moving out will get a reduced price. Those moving in will get a reduced value. It balances, but something was taken from those who left. Those who bought in the noise area will find themselves playing with assets that appeal to a much narrower market (the noise tolerant and the deaf).

Americans are free to choose a place to live based on their willingness to balance benefits and burdens. Wealthy government officials and diplomats will trade the noise of airplanes for the prestige and convenience of living in Georgetown. In New York airplanes are a small component of overall high noise levels and the market does not single it out. Suburbs and rural areas are a different story.

There, noise levels are a key market and value factor. When I build under an existing flight path, of course, I should expect no compensation for the noise, though I might welcome efforts to reduce it. When I buy in a quiet neighborhood and the government or a government controlled airport authority runs a flight path above my house, the Fourth Amendment's protection against the taking of property rights demands I receive "just compensation." It says nothing about compensating the bureaucracy with more taxes.

Wallace Kaufman
Pittsboro, NC

Wallace Kaufman is the author of Coming Out of the Woods, *an environmental memoir.*

Daniel Benjamin responds:

I'll respond to each point Kaufman makes in his thoughtful letter.

For whatever reason—tastes, income, or hearing loss—people who live near airports are willing to pay more for that property than is anyone else. I tagged them "noise lovers," just as I would call residents of the Outer Banks "beach lovers"—without in any way suggesting that the latter group looks forward to Category 5 hurricanes. In my column from now on, flight path denizens will be "noise tolerators" and coastal residents "beach tolerators."

The purpose of a noise tax would be to induce airlines to act *as though* they had to compensate landowners for noise. What is done with the tax proceeds is an entirely different matter. Nothing in my piece (or in the article I summarized) argued that the tax revenues should go to any particular use.

On Kaufman's last point, there appear to be two separate issues. First, he argues that the damage done by airplane noise differs depending on the circumstances under which it is generated. I agree. An efficient tax would vary depending on those circumstances.

Second, Kaufman distinguishes between two groups of people: those who move to the nuisance, fully aware of the 747s in their future, and those whose bucolic bliss is destroyed by encroaching aviation. This is a useful distinction. If I read him correctly, Kaufman argues that the former individuals should receive nothing for their efforts, while members of the latter group should be compensated for their losses. In any case, Kaufman argues, it is unproductive to use taxes on airport noise to fund still more noise or more bureaucrats. Again, I have no quarrels.

The moral of this story for me is that sometimes it takes more than 850 words (the length of my column) to say all I would like to say on a subject.

OF NOTE

ANACONDA, MT: AN OBSERVATION

By Tom Burnett

Proponents of "smart growth" want people to live in small houses on small lots close to services such as police, fire, and water, and near shopping, worship, and work. They argue that people will then rely less on automobiles. They will walk, bicycle, or take a bus.

Anaconda, Montana (population 10,278), was laid out as a company town in the nineteenth century, when it was home to one of the world's largest copper smelters.

Above all, it is compact. The lot size in the older parts of town is 30 feet by 50 feet, and some of the lots have three dwellings on them. Houses are narrow and can be as close as 18 inches apart. Front yards are between 6 and 14 feet deep.

Does this result in a self-sustaining bus system, fewer cars, and more walking? No.

Back when Anaconda was a mining center, and cars were rare, people walked to work. But today, Anacondans, like the rest of us, drive to the supermarket or even to Butte, 25 miles away. They drive to American Legion baseball games, Georgetown Lake, the golf course, the bowling alley, the park, or the cinema in Butte. And they drive across town to the church of their choice.

Smart growth promises greater social interaction between neighbors if houses have porches and are built close to the street and one another. We should observe people in Anaconda sitting on their porches and waving to pedestrians. On balmy evenings, though, Anacondans are playing softball, golfing, watching TV, surfing the Internet, changing diapers, playing darts at the bar, or fixing the 4-wheel drive.

Compact design does not appear to reduce auto use or increase neighborhood sociability. If it did, perhaps people would be flocking to this little hamlet town rather than to sprawling centers like Bozeman and Missoula.

Tom Burnett is a businessman in Bozeman, Montana.

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