
After Environmentalism

Three Approaches to Managing Environmental Regulation

Michael Kellogg

Environmentalism is dead. We are all environmentalists now. From Rachel Carson's *Silent Spring*, through the first Earth Day in 1970, to the international Eco-Summit in Brazil, the basic job of consciousness raising has been done. Even the recent recession did not stem the growing recognition that the quality of our lives depends to a great extent on the quality of the air we breathe and the water we drink, and on the wild and open spaces that define us as a country and renew us as individuals.

That was the easy part, akin to the early days of the civil rights movement, when the moral imperatives were clear and those involved in the struggle needed only a strong sense of purpose and the courage to persevere. As a movement matures, however, and its initial goals are accomplished, a whole new set of responsibilities and moral subtleties arises.

Americans currently spend over \$124 billion per year (2.5 percent of Gross National Product) complying with a raft of environmental statutes and regulations. The Environmental Protection Agency (EPA) has a staff of 18,000 and an operating budget of \$6.7 billion. It accounts for one

third of the federal regulatory budget, and is growing at an increasingly rapid pace.

Those huge expenses entitle us to ask if we are getting our money's worth from our current laws and regulations. Is the environment getting cleaner, better protected? Are there cheaper ways to achieve the same or a higher level of protection? Should we be doing more?

There are shelves full of books attempting to answer those questions. I will focus my discussion here on three, chosen because they are representative of the three most prevalent approaches in environmental policy today: (1) the command-and-control approach, which advocates direct government regulation of all activities affecting the environment; (2) the market-based incentive approach, which relies on government guidance to shape environmental policy but market-based incentives to implement it; and (3) the free-market approach, which holds that with a properly constructed scheme of property rights, supplemented by contract and tort law, market forces could take care of the environment without the need for government intervention.

Each of those approaches has both advocates and critics. None is free of flaws; but, flaws and all, we must choose our path and march into the

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twenty-first century with a coherent strategy for sustainable growth.

The Command-and-Control Approach

Our current environmental laws depend overwhelmingly on top-down bureaucratic mandates to prevent pollution. The Clean Air Act requires the EPA to set specific air quality and emissions standards that the states must implement. The Clean Water Act, through a permit program, attempts to

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control every discharge of pollutants into surface waters and imposes strict, technology-based controls on dischargers. The Resource Conservation and Recovery Act of 1976 (RCRA) establishes a cradle-to-grave program for tracking hazardous wastes and establishes strict, technology-based standards on landfills handling those wastes. Similar regimes are in place to control pesticides and toxic substances, to clean up existing hazardous waste sites, and to prevent ocean dumping and harm to endangered species. Volume after volume of regulations, all of mind-numbing complexity, have been passed.

Some believe that more of the same is in order, much more. One of them is our vice president, Al Gore. In his best-selling book, *Earth in the Balance: Ecology and the Human Spirit*, Gore notes that ever-bigger environmental problems require ever-bigger governmental solutions. It used to be, Gore explains, that we could deal with pollution on a local or regional level. Now the problems are just too big and touch upon every aspect of our lives. A regulatory solution must be designed to match. The government must make environmental improvement "the central organizing principle for civilization" and effect "a wrenching transformation of society."

To this end, Gore proposes a "Strategic Environmental Initiative" or global "Marshall Plan." As part of this plan, Gore says, we need "global constraints on acceptable behavior," including "regulatory frameworks, specific prohibitions, enforcement mechanisms, cooperative planning,

sharing arrangements, incentives, penalties, and mutual obligations necessary to make the overall plan a success." Gore calls on government to intervene in family planning, to "develop environmentally appropriate technologies," and to undertake a "massive" reeducation plan "concerning local, regional, and strategic threats to the environment."

Gore is terribly sincere. Unfortunately, he is not terribly thoughtful. There are widely recognized problems with a top-down, command-and-control approach to environmental issues, problems that Gore fails to even acknowledge. First, command-and-control regulation is extremely slow moving and necessarily underinformed. An intelligent approach to environmental issues requires a tremendous amount of detailed knowledge about myriad pollutants and the best technologies to deal with them. And what we actually know is the easy part. There is in fact great uncertainty about numerous environmental issues—do pesticides cause cancer? Can nuclear waste be disposed of safely? What is causing ozone depletion? Are carbon emissions causing global warming? The more uncertainty we face, the more we must ordinarily depend upon tens of thousands of individual entrepreneurs to develop creative solutions to our problems. Yet, in this critical area, we depend upon the wisdom and foresight of a single, centralized bureaucracy, subject to all the usual problems of misinformation, political pressure, and downright ineptitude.

Second, command-and-control regulation is highly adversarial, which contributes to its slowness. Because our command-and-control regulations do not change the underlying incentives of firms, but simply impose additional costs upon them, the firms have every incentive to resist the regulations. The EPA must, therefore, attempt to justify its regulations in painstaking detail, through numerous internal proceedings, in order to brace itself for the inevitable legal challenges (both from businesses, who think the EPA has gone too far, and from environmental groups, who think it has not gone far enough). Thus, regulations quickly become mired in the courts.

Third, command-and-control regulation is inefficient and expensive. Uniform national standards take no account of the varying difficulties in meeting environmental quality goals in different areas. Also, the costs of reducing pollution range widely from industry to industry and even from plant to plant. Uniform emissions standards require expensive equipment everywhere even though overall

ambient quality goals could be met in much cheaper ways at some facilities. Perhaps even more important, when the EPA mandates emissions limitations that assume a particular technology, firms have no incentive to develop new, possibly cleaner and more efficient technologies.

Fourth, command-and-control regulations generally hide the costs of pollution control in the cost of a product. New car buyers will rarely know how much pollution-control equipment contributed to the bottom line. That is even more true for buyers of electricity and energy-intensive products. Thus, intelligent public debate about how much we are willing to pay for cleanup is made impossible. Political accountability for environmental programs is accordingly minimized.

That brings us to the fifth problem. Command-and-control regulation, because of the vast amounts of money at stake, is inevitably politicized. Every environmental bill causes a feeding frenzy in Congress, as lobbyists for special interests descend upon the 535 members of the legislative branch who micromanage the EPA through the 100 committees and subcommittees to which the agency is obliged to report. It is not surprising that our environmental laws are riddled with political compromises that create perverse incentives and hinder any genuine attempts to clean up. Coalitions of polluters and anti-growth environmentalists—"bootleggers and baptists," to use Bruce Yandle's apt phrase, drawn from the unholy alliance supporting Sunday closing laws—have so distorted policy that new plants with the latest pollution control technology are often discouraged, while old plants spewing forth pollutants are protected. Pollution becomes a vested right and a protection against competition at the same time.

Superfund, our program to clean up hazardous wastes, illustrates all five of the problems with command-and-control regulation. First, it is incredibly slow and underinformed. Since the program began in 1980, EPA has identified some 1,250 sites around the country. It has cleaned up only 180. The EPA also has a terrible time distinguishing between truly hazardous wastes and garden-variety garbage, with the result that much time and even more money is expended on risks that turn out to be insubstantial. Studies done after the infamous Love Canal incident, which prompted Superfund in the first place, failed to show any significant health risk, beyond the mental trauma caused by the general hysteria.

Second, with a liability net cast without regard

to fault, imposing strict and full liability on every business and individual that handled the waste or owned the land, Superfund has spawned a huge amount of litigation. Businesses and individuals faced with financial ruin are fighting it every step of the way. It is now estimated that as much as 85 percent of the expenditures resulting from Superfund will go, not to cleanups, but to transaction costs, including (of course) lawyers' fees. Superfund liability is the most important source of new business for major law firms.

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Third, the program is unbelievably expensive, notwithstanding efforts to recover as much money as possible through the courts. So far, Superfund has spent \$6.7 billion to clean up 180 of the 1,250 identified sites. Estimates for the remaining cleanups range from \$125 billion to an astonishing \$1.25 trillion.

Fourth, because the Superfund dragnet is cast so wide, it is easy for politicians to hide the true costs of the program. Those costs place a great drain on the economy, but most are not directly reflected in the budget.

Finally, despite the fact that almost every disinterested, informed observer has concluded that Superfund is a mammoth disaster, it has so far proved immune to reform. Superfund is supported by a powerful coalition—including, of course, the legal community and the hazardous waste treatment industry, two powerful voices in Congress. Moreover, grass-roots environmental groups have found that their local organizing efforts get a strong boost from the community fear and anger that results when the EPA designates a Superfund site next to the neighborhood school.

We are a rich country and can afford to devote resources to environmental quality. Indeed, we can't afford not to. But there are limits to everything, and those limits mean we must concentrate

our resources on tackling the most serious problems in the most efficient way.

The Market-Based Incentives Approach

Dissatisfaction with command-and-control environmentalism has led many to look for more creative, market-based solutions to our problems. The idea is to make as much use as possible of what Nobel laureate in economics F.A. Hayek called "the spontaneous forces of society" and use government only where necessary to guide those forces in a socially optimal direction. The idea, in short, is to let government steer and the market row. Francis Cairncross' book *Costing the Earth* provides a clear and compelling statement of this approach.

Command-and-control regulation depends upon mandates to control behavior. The economic approach relies on market-based incentives to change behavior. Regulators set the overall price or quantity of pollution, but individuals and businesses determine how best, and most efficiently, to clean up. As a consequence, a market-based approach tends to be more flexible and less adversarial. It encourages the development of least-cost technologies. Market-based schemes also have the distinct advantage of making pollution-control

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Market-based incentives can be one of three basic types. First, there are pollution taxes, or so-called "green fees." "When properly designed," Cairncross notes, "they should impose on a polluter the costs that would otherwise be dumped on the environment." In other words, they internalize the externalities.

For example, burning carbon may cause immediate pollution as well as more long-term potential effects such as acid rain and global warming. But neither the short- nor the long-term effects are taken into account when an individual or business makes the decision to burn fossil fuels. By placing

an excise tax on the producers of raw fossil fuels, we can ensure that all activities using those fossil fuels will reflect something nearer their true costs. Consumption will drop and government revenues will increase at the same time. Similar taxes, in the form of by-the-bag household collection charges, could dramatically reduce the 4.5 pounds of trash discarded daily by every man, woman, and child in America and thereby ease the coming crisis in solid waste disposal. Special electronically monitored rush-hour tolls could reduce congestion on urban highways, which currently costs about \$20 billion in time delays and excess fuel consumption. And so on.

The great advantage of such taxes is that they discourage activities (like pollution, waste disposal, and driving) that we want to discourage, instead of activities (like working and investing) that we want to encourage. As long as the revenues received from green taxes are used to reduce taxes in other areas, they should have little overall inflationary impact. And, Cairncross suggests, "[t]o protect the poor, whose energy bills tend to be lowest in absolute terms but highest in relation to their incomes, some of the yield from energy taxes can be steered into welfare benefits or into a flat-rate energy allowance."

A similar approach (which fixes the amount of pollution rather than the cost) would create tradeable emission permits or marketable pollution rights or (for the more sensitive, who don't like the idea that anyone might acquire a right to pollute), we could call them emission-reduction credits. Under such schemes, the government sets the total permitted level of a particular pollutant and then auctions off shares of that total. Each company can pollute up to the quota set by the permits it acquires. If the company introduces a new, cleaner technology that allows it to fall below those limits, it can sell its unneeded pollution rights to other polluters or to new companies that may want to enter the business. "Because high-cost polluters save money by buying extra permits rather than cleaning up," Cairncross writes, "pollution will be concentrated among those companies for whom prevention is most expensive. Yet the environment as a whole will be cleaner, because there is a finite limit on allowable pollution."

Variations on this theme are possible. For example, instead of imposing ever more costly (and marginally less effective) cleanup requirements on central power plants, the plants can pay for their pollution through community conservation mea-

asures by, say, getting homeowners to replace gas lawn mowers with far cleaner electric mowers or regular light bulbs with energy-efficient fluorescent bulbs. As state and local public utility commissions catch on to the possibilities, there could be a growing market in "negawatts," marketable units of conserved energy. It might also be possible to develop a system of tradeable permits for the percentage of recycled materials in products.

There are, however, some circumstances in which a "right to pollute," even if called an "emission-reduction credit," is not appropriate. For example, we don't want simply to set a cap on the total amount of toxic waste and then allow companies to decide on the cheapest way to dispose of those wastes. We want to ensure that such wastes are disposed of safely in light of the particular risks they pose. Here, something like a deposit-refund-and-disposal system, working in a similar manner to existing bottle bills, might work. Dealers in items like lead-acid batteries, dry-cleaning chemicals, freon, and lubricating oil would be required to charge a hefty deposit that would be refunded when the purchasers return the items for proper, safe disposal. Fewer batteries would end up in landfills, and less chemicals and oil would be left to seep into the groundwater supplies.

Market-based incentives do seem to be a substantial improvement over command-and-control approaches, but they are not without their flaws. Indeed, both green taxes and emission permits have a very serious drawback. As Cairncross acknowledges for taxes, "It is almost impossible to set them at the 'right' level"—i.e., the level at which we, as a society, have concluded that we are willing to pay for environmental protection. "That magic point, at which the costs of pollution prevention catch up with the benefits, is hard enough to discover even on paper. To hit it by setting taxes at precisely the right level is even more difficult. Keeping taxes at that right level, year after year, is probably impossible," Cairncross admits.

It is equally difficult to set the "right" level for emission permits. Economists want to permit pollution at the level at which the cost of further abatement measures exceeds the perceived benefits of that abatement. They can either be precise about the level (permits) and guess at the cost or they can be precise about the costs (taxes) and guess at the level of pollution that will result. But they cannot fix both values at the same time.

More fundamentally, in the absence of a genuine market structure, it is not clear what the

"right" level of environmental protection even means. Prices are ordinarily set by the free interplay of supply and demand. But in a system of market-based incentives, the government controls one factor in the equation (either price or supply). The result is, at best, an artificial market. Some efficiency may be gained over a command-and-control regime, but government is still responsible for assessing various risks and benefits and deciding how many resources to dedicate to each. Our government has already proven that it is not very good at that. We throw money at some fairly minor risks while virtually ignoring other, much larger ones. (For example, pollution accounts for about 2 percent of all cancer deaths; smoking contributes to 30 percent, including 2,500 deaths alleged each year from passive smoking. Yet we spend \$120 billion combatting pollution, and actually subsidize smoking through special programs for tobacco farmers.) We have no clear sense of priorities other than that created by political logrolling or the latest public hysteria, whether it be Love Canal, Alar, or cellular phones.

Free-Market Environmentalism

A rapidly growing third approach to environmental regulation is developing, called "Free Market Environmentalism." This may seem like an oxymoron. According to conventional wisdom, after

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all, rapacious capitalism is what got us into trouble in the first place. But the fall of Communist regimes throughout the world has so discredited central planning that the free-market types are holding their heads high and seeking to expand their jurisdiction into seemingly sacrosanct government territory. Terry Anderson and Donald Leal's

book *Free Market Environmentalism* is representative of this movement and its ideas.

The book attempts to show that private environmental harms can be alleviated wholly through market mechanisms (which depend upon common-law property rights and the law of contract and torts) without government regulatory intervention. The bottom line is that if government would simply get out of the way, we would obtain an "optimal" level of environmental protection at a much lower cost.

Anderson and Leal claim that the solution to environmental degradation is a system of well-specified property rights to natural resources. Natural resources should be taken out of the hands of government which, because of a lack of proper market incentives, either overprotects or underprotects them. Clean air and water, old-growth forests, free-flowing rivers, endangered species—all would be taken out of government stewardship and placed in private hands by means of newly defined

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"Whether these rights are held by individuals, corporations, non-profit environmental groups, or communal groups," Anderson and Leal explain, "a discipline is imposed on resource users because the wealth of the owner of the property right is at stake if bad decisions are made." Moreover, owners with property rights will be able to engage in freely negotiated contracts with those seeking environmental protection, so that the "right" level—as much as we are all willing to pay for and no more—will be obtained. The market, they claim, will "channel . . . the heightened environmental consciousness into win-win solutions that can sustain economic growth, enhance environmental

quality, and promote harmony."

There is clearly something to this. The market can take us almost anywhere we want to go, provided it has a suitable infrastructure of property rights, enforceable contracts, bank accounts, trading pits, and accounting systems. Three centuries ago most of America didn't need fences or even property deeds. In time we ran out of free land. We could then have handed all real estate over to some Karl Marx in the Ministry of Lands, with disastrous results. Instead, we developed private property rights, backed by deeds, registries, joint covenants, and the laws of contract, trespass, and nuisance. Now that we're running out of free air and water, perhaps we've arrived at a similar fork in the political road.

Thus, the direction in which the free-market environmentalists are pointing is enticing and warrants serious exploration. But there are some rather obvious and glaring problems with the "pure" free-market approach, and one more subtle and deeper problem, that Anderson and Leal wholly fail to address.

First, how are the new property rights to be defined, distributed, and enforced? Government cannot just get out of the way and let the market do its work. Legal norms are the necessary framework within which the market functions, but such norms do not spring into being fully grown. They are shaped by government, which includes legislators, administrative agencies, and common-law courts.

If free-market environmentalists have no faith in government to act responsibly in regulating our environment (and none of the three components of government are immune from their criticisms), where do they get their faith in the ability of government to set up a rational, fairly administered set of property rights? If the billions we spend now on environmental regulation invites logrolling in Congress and undue influence peddling by special interest groups, why would the same thing not happen when hundreds of billions of dollars in newly created property rights are at stake? Anderson and Leal, at least, have not a word to say on those critical questions.

Perhaps they believe that purely from the perspective of economic efficiency (as opposed to fairness) it simply doesn't matter how government distributes the rights. The important thing is that a free market exists to *redistribute* the rights in the most economically efficient way. But if property rights are to be redistributed efficiently, we must

have an efficient common-law system of torts (to determine the boundaries and ensure the enforcement of those rights) and contracts (to permit their transfer). Yet there is no reason to believe that we have any such thing.

The current liability crisis aside, it is not clear that the common law was ever a satisfactory mechanism for dealing with environmental harms. The common law of nuisance, for example, with its vague strictures against "unreasonable" interference with the enjoyment of property, was and is an unpredictable morass. Is air pollution over my property actionable only when I can demonstrate physical harm? Or can pollution trespasses be actionable on aesthetic grounds alone? If the former, property rights against pollution are much weaker than normal property rights—trespass is ordinarily actionable regardless of physical harm. If the latter, measuring effects and damages would become impossibly vague. Is the proper remedy for pollution trespasses injunction, or only damages? If the former, one intransigent plaintiff could deindustrialize an entire community; indeed, with environmental effects becoming increasingly national and even international in scope, a judge citing acid rain in Vermont could try to shut down coal-fired plants throughout the Rust Belt. If the latter, property rights have been attenuated to the point that polluting industries in effect have the power of eminent domain.

Are multiple polluters jointly and severally or only proportionally liable? The former result is inequitable and economically inefficient, if the desire of the system is to internalize the externalities imposed by the polluter. But the latter result would lead to impossible inquiries into degrees of causation, even if one could handle the mechanics of getting all the potential defendants into court.

The common law never developed adequate or consistent answers to these problems. It dealt with them on a wholly ad hoc basis. Predictability of results—a chief virtue of any well-constructed legal system—was therefore lacking. And the administrative problems (service of process, jurisdiction, choice of law, and the like) are extremely troublesome.

Free-market environmentalists could counter that even the liability regime does not really matter, so long as the parties are free to contract for an efficient result. But here the problems of market failure caused by limitations in technology and infor-

mation appear even more insuperable. Anderson and Leal acknowledge that if the newly created property rights "cannot be measured, monitored, and marketed, then there is little possibility for exchange" and, hence, little possibility for an optimal result. But beyond simply asserting that environmental entrepreneurs will devise clever new ways of marketing environmental values, they have nothing to say on that critical question. And yet it has been the inability to answer that question that

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has created the strongest case for government intervention to begin with.

In a 1960 article called "The Problem of Social Costs," Ronald Coase put forth the basic argument for regulatory intervention in the market to protect the environment. The argument is based on the market failure caused by transaction costs, and has been restated over the years in different terms by Harold Demsetz and, in a particularly catchy way, by Garrett Hardin, in his 1968 article "The Tragedy of the Commons." But all the essentials are in Coase, who won a Nobel Prize for his insights.

As an initial matter, Coase explains why, in a world without transaction costs, the market would ensure an "optimal" level of pollution. Coase points out that externalities cut both ways. That is, if A runs a smelter on his property, an externality of that activity will be pollution (in the form of smoke and bad smells) drifting onto B's property next door. But suppose B's bundle of property rights—as created and enforced by the state—includes the right to enjoin any activity that causes pollution on B's property. Then, an externality of B's unpolluted possession of his property will be A's inability to put his own property to an economically valuable use. From a purely economic perspective, neither harm is inherently better or worse; everything depends upon the values the market assigns to those harms.



"The question" of externalities, Coase explains, "is commonly thought of as one in which A inflicts harm on B and what has to be decided is: How should we restrain A? But this is wrong. We are dealing with a problem of a reciprocal nature. To avoid the harm to B would inflict harms on A. The real question that has to be decided is: Should A be allowed to harm B or should B be allowed to harm A? The problem is to avoid the more serious harm."

In the standard case of a smoke nuisance, which may affect a vast number of people engaged in a wide variety of activities, the administrative costs seem to be so high as to make any attempt to deal with the problem within the confines of a market system impossible.

In a world without transaction costs, an optimal result, in terms of efficiency, would be reached regardless of the legal regime. If running the smelter is worth \$5 to A, whereas unpolluted enjoyment of his land is worth only \$3 to B, then even if B has a legal right to enjoin A's smelter, B will accept somewhere between \$3 and \$5 (depending upon how good a bargainer he is) to let A operate his smelter. If the values are reversed, then, even if B has no right to enjoin A's smelter, A will accept

somewhere between \$3 and \$5 to shut down the smelter. The legal rules may result in some transfer of wealth but, in the absence of transaction costs, they will not prevent the activity that is worth most from continuing. "The ultimate result (which maximizes the value of production)," Coase writes, "is independent of the legal position if the pricing system is assumed to work without cost."

The only problem with this lovely, symmetrical theory, Coase points out, is that the assumption that there are no costs involved in carrying out market transactions is completely unrealistic. "In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on. These operations are often extremely costly, sufficiently costly at any rate to prevent many transactions that would be carried out in a world in which the pricing system worked without cost." In the example given above, the pollution from A's smelter is likely to affect, in varying degrees, a large number of other landowners. This would quickly make negotiations impractical, particularly because of problems caused by holdouts (it only takes one to enjoin A's smelter) and free riders (a landowner may reap the benefits of having A stop running his smelter but refuse to share in the costs). Conversely, where pollution is caused by multiple sources (e.g., cars), negotiations with each individual source are impracticable.

Once the costs of carrying out market transactions are taken into account, it is clear that the initial legal regime makes a great deal of difference to the efficiency with which the economic system operates. An efficient rearrangement of those rights will only be undertaken when the increase in the value of production resulting from the rearrangement is greater than the costs which would be involved in bringing it about. "When it is less," Coase explains, "the granting of an injunction (or the knowledge that it would be granted) or the liability to pay damages may result in an activity being discontinued (or may prevent its being started) which would be undertaken if market transactions were costless."

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deal with the problem within the confines of a market system impossible. And that seems to be true with most of the problems that we term "environmental." An alternative solution to these problems, therefore, is direct government regulation. "Instead of instituting a legal system of rights which can be modified by transactions on the market," Coase writes, "the government may impose regulations which state what people must or must not do and which have to be obeyed. Thus, the government (by statute or perhaps more likely through an administrative agency) may, to deal with the problem of smoke nuisance, decree that certain methods of production should or should not be used (e.g. that smoke preventing devices should be installed or that coal or oil should not be burned) or may confine certain types of business to certain districts (zoning regulations)."

In short, says Coase, "If market transactions were costless, all that matters (questions of equity apart) is that the rights of the various parties should be well-defined and the results of legal actions easy to forecast." That seems to be the regime that the free-market environmentalists imagine. But such a regime simply doesn't work "when market transactions are so costly as to make it difficult to change the arrangement of rights established by the law." And that seems to be the situation we face in dealing with environmental problems. Free-market environmentalism simply will not work unless transaction costs can be reduced sufficiently that any inefficiencies caused by those costs will be less than the inefficiencies created by government regulation.

There is a potential answer to Coase's argument. Coase was writing in 1960, well before the computer revolution. The cost of processing and transmitting information has dropped by a factor of millions. Our ability to measure pollution and quantify its impact has correspondingly increased. It may well be, then, that the information age will eventually make free-market environmentalism sufficiently feasible that any remaining inefficiencies would be small in comparison to the inefficiencies created by market-based or command-and-control solutions. If so, then Coase was getting his Nobel Prize just as the information revolution was rendering his insights obsolete.

But it is not enough simply to point to the shrinking cost and increasing power of today's computers and the ingenuity of modern-day entrepreneurs. Those who are serious about free-market environmentalism have to get very concrete about

just how externalities will be eliminated. It is easy enough to cite examples of how market-based solutions are enhanced by the computer revolution. Electronic monitoring of cars to impose rush-hour tolls and computer trading of emission permits are obvious examples. But truly free-market solutions—solutions that depend not upon government programs but upon private negotiations (and, where negotiations fail, lawsuits) between private parties—are more difficult to envision. Perhaps some sort of massive tracking of all individual pollutants that will allow us to trace their causes will some day be possible. But even then negotiations with dispersed groups of affected people will be necessary, along with the problems of holdouts and free riders. It is difficult to see how those problems of coordination are to be eliminated without government regulation. The free-market environmentalists apparently do not even see the problems.

Finally, do we really want to treat environmental issues from Coase's "purely economic perspective"? Let's suppose that modern technologies were

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capable of completely eliminating market failure by making information essentially costless and eliminating transaction costs. Even then, it is still not clear that all or even most environmental decisions should be made solely by the market.

Under the regime proposed by free-market environmentalists, if someone wants to buy Yosemite and put up condos (because the purchasers of the condos will pay more than those who would pay to have the property maintained in a pristine state), then condos there will be. If the new owners want to clear-cut the last of the old-growth forests (because the Japanese will pay more for the wood than nature lovers will for the woods), then goodbye old-growth forests and the spotted owl to boot.

Most of us would, I suspect, be revolted by such a result or even by having to take up a collection to prevent it. And it is not just that we would resent

the money. The sense is rather that some things simply should not be reduced to monetary terms. Some things are, or should be, sacred.

Under a pure free-market approach, all value is decided by the voluntarily transacting individual. But the basic motive of the environmental movement is a belief that nature has an intrinsic value, a value independent of the choices of particular individuals and, hence, transcending market considerations. Market-based approaches to environmental regulation can take account of this intrinsic value; free-market environmentalism, in its purest form, cannot. For those who think that environmental cleanliness is next to godliness, for those who view the return of the timber wolf to Yellowstone as at least the partial repayment of a spiritual debt, a pure form of free-market environmentalism will never do.

Reducing environmental protection to monetary terms can never be completely avoided. Whenever command-and-control regulation or market-based solutions are in question, government is implicitly or explicitly (and quite properly) deciding how much protection is enough, how much we, as a society, are willing to spend on clean air, clean water, biodiversity, and open spaces. But there is merit in having this be a public debate in which the intrinsic value of nature can be considered by society as a whole and not simply bartered away in the private dealings of individuals. Granted, there are grave flaws in this process. Environmental decisions are inevitably distorted by the pushing and shoving of special-interest politics and they are all too often submerged from public view in the technical arcana of regulatory proceedings.

But the existence of open spaces and wild rivers held in common for the use of all creatures is so important to defining us as a society that we should struggle to maintain our common stewardship over those resources notwithstanding the frustrations and inevitable inefficiencies.

Command-and-control style regulation is a relic of an earlier age (the '60s and '70s) when primitive information technologies seemed to require large bureaucracies to deal with complex problems.

Today, market-based solutions to our environmental problems seem clearly preferable on any number of grounds.

Many old-guard environmentalists, however, view any reliance on markets as apostasy and see advances in information processing as part of the problem, not part of the solution. "The more we rely on technology to mediate our relationship to nature," says Gore, "the more we encounter the same trade-off: we have more power to process what we need from nature more conveniently for more people, but the sense of awe and reverence that used to be present in our relationship to nature is often left behind."

But a "reverence . . . for information and analysis," does not, as Gore suggests, preclude a reverence for nature. Indeed, as the market-based incentives being developed seem to suggest, improved techniques for information and analysis can go a long way toward giving us the environmental protection we want at a price we, as a society, are willing to pay. Conversely, a reverence for markets and a healthy suspicion of regulation need not result in a policy that accepts market failure and environmental degradation as a fair price to pay for cutting government out of the equation. Neither the anti-market, command-and-control luddites, nor the anti-government, free-market futurists, should distract us from the critical advances that we can make today to improve the world in which we live.

Selected Readings

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