

SEIBENTHALER LECTURE

ENVIRONMENTAL LAW AT A CROSSROAD

by E. Donald Elliott*

I. THE IMPORTANCE OF ENVIRONMENTAL LAW

Environmental law is important for at least two reasons. Over the last decade, environmental law has probably been the single largest growth area in the law,¹ and this trend promises to continue. Today about half the total cost of government regulation of the economy is attributable to regulation to preserve and enhance the environment.² We spend about \$160 to \$185 billion a year on government regulation, of which something on the order of \$90 to \$100 billion a year is spent on environmental protection.³ Between now and the year 2000, that \$100 billion is going to increase to about \$155 billion, which is roughly 2.5 percent of our gross national product (GNP).⁴ To put that in perspective, 2.5 percent of GNP is just about the same proportion of gross national product that we spent on the Marshall Plan after World War II. As a commitment of social resources, then, environmental law is

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1. See generally Alain L. Sanders, *Battling Crimes Against Nature*, TIME, March 12, 1990, at 54 (20,000 environmental lawyers are "some of the most sought after professionals.").

2. Kirk Victor, *Quayle's Quiet Coup*, NATIONAL JOURNAL, July 6, 1991, at 1676-77 (About half of the \$185 billion annual cost of government regulation stems from environmental rules; describing operations of the President's Council on Competitiveness).

3. Robert W. Hahn & John A. Hird, *The Costs and Benefits of Regulation: Review and Synthesis*, 8 YALE J. ON REG. 233 (1991).

4. William K. Reilly, *Aiming Before We Shoot: The "Quiet Revolution" in Environmental Policy*, Address Before the National Press Club (Sept. 26, 1990) (summarizing results of EPA's Cost of Clean-Up Report in which EPA's economists estimate that in 1990 the U.S. private and public sectors spent more than \$90 billion (in 1986 dollars) for pollution control; by the year 2000, the cost will have grown to about \$155 billion annually (also in 1986 dollars), or about 2.7 percent of total GNP).

the equivalent of an annual Marshall Plan at home to clean up the environment.⁵

By pointing out that environmental law represents a very significant commitment of social resources, I do not want to be misunderstood as implying that we are spending too much on the environment. On the contrary, the percentage of our GNP that we spend on environmental protection is almost identical to what the Germans and Japanese are spending on environmental protection. The issue is not so much how much we are spending, but how we are spending it, and particularly, whether we are getting our money's worth from this very significant commitment of our scarce national resources.⁶

Not only is environmental law important as a major commitment of social resources, it is also important in its own right as a significant factor in virtually every business transaction.⁷ Today, environmental law is like tax law: you can not do a major business deal without considering the environmental implications.

But environmental law is also important for a second reason as well. Environmental law represents the state-of-the-art in the use of law to manage complex systems. After all, it is really rather remarkable that a little tiny agency like the Environmental Protection Agency, consisting of a mere 18,000 people (less than 0.3 percent of the federal government workforce) as opposed to say, the Department of Agriculture with over 100,000 people, has been able to leverage its efforts to re-direct private resources to have a tremendous effect on the economy. Environmental law is worthy of serious study not only for its own importance, but also as a case history in the use of law as an instrument of social change. Environmental law represents the state-of-the-art in using legal institutions and techniques to manage complex systems to achieve social goals.

Tonight I am going to focus on environmental law for what it can teach us about the use of legal mechanisms to transform

5. See E. Donald Elliott, *A Cabin on the Mountain: Reflections on the Distributional Consequences of Environmental Protection Programs*, 1 KAN. J.L. & PUB. POL'Y 5 (1991).

6. I have previously addressed the issue of wasting precious resources in E. Donald Elliott, *Superfund: EPA Success, National Debacle?*, 6 NAT. RESOURCES & ENV'T 11 (1992).

7. E. Donald Elliott, *Foreword: A New Style of Ecological Thinking in Environmental Law*, 26 WAKE FOREST L. REV. 1 (1991).

complex systems. In short, my emphasis is on the *law* in environmental law, on the legal techniques and institutions that have been used. My topic is not environmental policy, not what I think we ought to be doing in a substantive way in the years ahead. That is another lecture, Dean Stevens, and if you want me to give that one too, I would be delighted to come back to give it on some other occasion.

But what concerns me tonight has to do primarily with the institutions of environmental law, with the legal techniques and mechanisms that we use to make and implement our environmental policies.⁸

II. THE INSTITUTIONAL SIDE OF ENVIRONMENTAL LAW

In a real sense, "environmental law" as a discipline is defined by a characteristic set of legal institutions and techniques. The problems of concern to environmental law are not new. The first smoke control ordinance was passed in London in 1278, so in one sense we have had environmental laws at least since the 13th century. But what defines environmental law in the modern sense, what distinguishes it from nuisance law and other legal predecessors for regulating the relationship between human beings and the natural world, is really the institutional side.

Environmental law⁹ emerged as a separate discipline in the U.S. about 1970, and since that time, we have understood what we mean by environmental law in this country largely in terms of a process that I am going to call *bureaucratic standard-setting*. The standard-setting process that we have relied on to regulate pollution in the United States for the past two decades consists of three essential elements: (1) pollution tolerance standards, (2) set by bureaucrats through informal rulemaking, (3) enforced by citizen suits.

On a substantive level, we do not try to eliminate pollution; we try to control it to tolerable levels through "pollution tolerance

8. I have long been interested in the institutional side of environmental lawmaking. See, e.g., E. Donald Elliott, *Goal Analysis vs. Institutional Analysis of Toxic Compensation Systems*, 73 GEO. L.J. 1357 (1985).

9. The part of "environmental law" with which I am concerned here deals with the regulation of pollution. There is another side of the business that deals with the preservation of wilderness, and natural resources and a number of other issues. However, the pollution regulation part of environmental law accounts for a very substantial portion of the \$90 billion annual commitment of social resources that I have been talking about.

standards." Typically, we set a standard, which is a bit like a speed limit. A pollution standard defines what the maximum permissible level of pollution in a particular medium can be, for example, "so many pounds of sulfur dioxide per million BTU," or "so many micrograms of trichloroethane per cubic meter," and so on.

These standards, or pollution tolerance limits, can be set in various ways. They can be set based on technology; they can be set based on health effects; they can be set based on economics; or on some combination of these factors.¹⁰ But setting standards defining the levels of various pollutants that we are willing to tolerate has been the basic method that we use for regulating pollution in environmental law.

The second element that distinguishes the legal techniques used in environmental law is the use of informal rulemaking, that is, notice and comment rulemaking under Section 553 of the Administrative Procedure Act, as a way of setting pollution tolerance standards.¹¹ The procedural or administrative law side of environmental law has been a very important factor that I think is not often remarked enough. It is virtually impossible to imagine an EPA, or the federal pollution control statutes as we understand them, without informal rulemaking. That is clear from considering the experience of other countries, such as those in Eastern Europe. The development of detailed rules and regulation at the administrative level through informal rulemaking is one of the major factors that distinguishes U.S. environmental law from that in many other countries.

Many countries around the world, including those in Eastern Europe, have tough environmental laws at the statutory level. But without an administrative process to turn broad statutory declarations into enforceable regulations tailored to particular industries, statutory declarations have often remained just that — declarations with little effect on actual practice in the field.

10. On these distinctions, see J. Bonine & T. McGarity, *THE LAW OF ENVIRONMENTAL PROTECTION: CASES, LEGISLATION, POLICIES* 422-23 (1984). See also Kristine L. Hall, *The Control of Toxic Pollutants Under the Federal Water Pollution Control Act Amendments of 1972*, 63 IOWA L. REV. 609 (1978) (recounting history of EPA's shift from environmental quality-based "standards" to technology-based effluent "limitations").

11. 5 U.S.C.A. § 553 (West 1992). For an argument that during the 1970's the "center of gravity" of government policymaking shifted into the notice-and-comment rulemaking process, see Bernard Schwartz, *ADMINISTRATIVE LAW* 149 (2d ed., 1984).

Another crucial element for getting environmental law off the statutory drawing boards and actually implemented in changing behavior is the concept of citizen suits.¹² Independent suits by citizens to enforce the rules, to make sure that the Government keeps its promises, are a truly American innovation, and one which is of great interest to other countries around the world that are looking for effective ways to enforce pollution standards.

Those three elements, bureaucratic standard-setting, citizen suits, and the use of informal rulemaking to develop the standards, basically constitute the outstanding features of our present system for making and implementing pollution control regulations.

These mechanisms of bureaucratic standard-setting, informal rulemaking and citizen suits are orders of magnitude more powerful than the techniques that preceded them in terms of their ability to assimilate complex information and translate it into legal controls that the regulatory system can manage. They are more powerful than case-by-case litigation before courts, which was the basic institutional system used by the common law nuisance system for regulating the environment, or even statutory regulation of the environment, of the sort that was passed during the progressive era.¹³

III. SIGNS OF SYSTEM OVERLOAD

A crisis is coming in environmental law in part because our current state-of-the-art techniques for centralized legal control, for all of their extraordinary power, are simply not adequate to do the task we have set for them. In short, the basic institutional mechanisms that we use in environmental law are rapidly reaching or surpassing their limits in terms of their ability to manage complex systems. The goal we have set for environmental law is no less than to try to transform human systems, including economic systems, so that they are more compatible with the natural order.¹⁴ My central thesis is that you simply can not succeed in a mission

12. See, e.g., Adeeb Fadil, *Citizen Suits Against Polluters: Picking Up the Pace*, 9 HARV. ENVTL. L. REV. 23 (1985).

13. For a general account of the evolution of the American legal system from common law to a system of bureaucratic regulation, see generally Bruce Ackerman, *RECONSTRUCTING AMERICAN LAW* (1984).

14. See Elliott, *supra* note 5.

that complex using the existing techniques of centralized legal control. In short, "you can't get there from here" using our present institutional techniques for making and enforcing environmental law.¹⁵

The coming crisis in environmental law is really one of an overloaded law-making system. The danger signals that the present institutional structure for making and enforcing environmental laws are overloaded, stressed, and cannot keep up are all around us. One clear sign is the high cost of the present system, particularly the high transaction costs.¹⁶ The best illustration of the high transaction costs of the present institutional arrangement is the Superfund program, where recent estimates have been that we will spend as much as \$25 billion over the next decade essentially on transaction costs for lawyers and consultants rather than actually cleaning up sites.¹⁷ About twenty percent of the total is going to lawyers and consultants.

On the surface, viewed solely as wasted money, some might not be too concerned about transaction costs. They simply view having to spend that extra money as punishment that the polluters are going to have to pay for their sins. What is not often realized is that additional consequences of our high transaction cost system are the tremendous delays that we experience. One side of high transaction costs is money that is wasted; another side of that same coin is all the time that is wasted.

Again, the Superfund program exemplifies this problem. Over the decade that the Superfund program has been in effect, we have finished cleaning up only sixty-three sites. That is sixty-three out of 1200 sites that are on the National Priority List, and out of over 20,000 candidate sites that have been identified.¹⁸

One statistic crystallizes all the problems we have experienced in implementing the Superfund program. On average, it takes ten years to clean up an average Superfund site. And of that ten

15. See Peter Brimelow & Leslie Spencer, *You Can't Get There From Here*, FORBES, July 6, 1992, at 59 (quoting author and others on the point discussed in the text).

16. "Transaction costs" is a term drawn from economics. In this context, it means the costs of running the process, e.g. the costs of deciding what the remedy should be at a Superfund site, as opposed to the direct costs of implementing a clean-up.

17. See *Toxic Waste; Paying for the Past*, ECONOMIST, Feb. 29, 1992, at 80. See also Marianne Lavelle, *Study Measures Superfund Cost; The Counsel Fees Vary*, NAT'L L.J., May 4, 1992, at 3.

18. Elliott, *supra* note 6.

years, we only spend three years in actual construction work.¹⁹ The first seven years are spent in a legalistic, bureaucratic process of arguing about what is going to be done at the site, and only the last three years are spent actually doing the work on-site.

Long delays are the price of legalistic bureaucracy, and you see similar delays in virtually every area of environmental law. Another good illustration is the problem of regulating air toxics, highly hazardous substances being put into the air. Almost a decade and a half ago, Dave Doniger, now affiliated with the environmental group, the National Resources Defense Council, wrote an interesting article about the problems of implementing the air toxics provision of the Clean Air Act.²⁰ He complained bitterly that it was taking eight to ten years to regulate some of the most hazardous substances like benzene, asbestos or vinyl chloride.²¹ Unfortunately, in 1991, we are still struggling to regulate some of the very same substances; we still have not finished with asbestos, for example.

It can take ten to fifteen years to complete the job of regulating a toxic chemical under the Clean Air Act so that it will finally stand up in court. Over the twenty years since the Clean Air Act was passed, we have regulated exactly eight air toxics under the federal Clean Air Act and that is out of a list of 189 candidate substances that Congress wrote into the statute out of frustration in 1991.

Another illustration of the difficulties that we encounter under the present system of legalistic bureaucracy is EPA's asbestos ban rule. Recently, after almost a ten year process and developing a 100,000 page record, EPA banned all uses of asbestos in certain areas.²² Asbestos is a substance that has been known for many years to cause a number of health hazards in high doses. As early as 1918, many life insurance companies stopped writing insurance policies on asbestos workers because of the "assumed health-injurious conditions" in the asbestos industry.²³ To be sure, as time has gone on, we have learned more about various effects of

19. *Id.*

20. David Doniger, *Federal Regulation of Vinyl Chloride: A Short Course on the Law and Policy of Toxic Substances Control*, 7 *ECOLOGY L.Q.* 497 (1978).

21. *Id.*

22. 54 *Fed. Reg.* 29,460 (1989).

23. Paul Brodeur, *OUTRAGEOUS MISCONDUCT: THE ASBESTOS INDUSTRY ON TRIAL* 18 (1985).

asbestos, and controversy remains concerning the extent of risks at low levels of exposure. But asbestos is hardly a new substance that we only recently learned was hazardous.²⁴ Despite a ten year process concerning one hazardous substance about which a great deal is known, and a 100,000 page record, EPA's rule was recently set aside in court for an inadequate record.²⁵

Like the long delays and high transaction costs that we experience in the Superfund program, and the fact that it takes many years to regulate airborne toxic chemicals, another sign of the stress on our lawmaking system in the environmental area is that we have only dealt with a few out of a very large set of potentially hazardous chemicals. There are over 600,000 substances on the EPA chemical inventory, with roughly 50,000 of them in general use. We probably only have data on about somewhere from 20,000 to 40,000 of the 600,000 substances that are out there,²⁶ and we have only regulated a handful.²⁷

Long delays, and spotty coverage — with over-regulation in some areas, under-regulation (or no regulation at all) in other areas — as well as high transaction costs are the indirect, less obvious costs of our cumbersome, legalistic system of regulation.

The classic description of the source of these problems is in an article by Doug Costle, the Administrator of EPA during the Carter Administration, called *The Future Regulatory History of Phlogiston*.²⁸ It is a great article, one that ought to be required reading in all administrative law and environmental law courses. Written in 1981, shortly after Costle left EPA, the article is a

24. To be sure, as time has gone on, we have learned more about the hazards of asbestos, and controversy remains concerning the effects of low-levels of exposure.

25. *Corrosion Proof Fittings v. EPA*, No. 89-4596, 947 F.2d 1201 (5th Cir. 1991).

26. Alyson Flournoy, *Legislating Inaction: Asking the Wrong Questions in Protective Environmental Decisionmaking*, 15 HARV. ENVTL. L. REV. 327, 330 (1991) (No toxicity information exists for over "eighty percent of the 48,000 chemical substances in general commercial use.").

27. For an excellent article that describes the problems of our present regulatory structure from an information perspective like that in the text, see John S. Applegate, *The Perils of Unreasonable Risk: Information, Regulatory Policy, and Toxic Substances Control*, 91 COLUM. L. REV. 261 (1991). See also Flournoy, *supra* note 26; Howard Latin, *Good Science, Bad Regulation, and Toxic Risk Assessment*, 5 YALE J. ON REG. 89 (1988) (describing difficulties of marshalling information sufficient to satisfy present regulatory standards); Elliott, *supra* note 8 (arguing that design of regulatory systems should be fitted to available information).

28. Douglas M. Costle, *Brave New Chemical: The Future Regulatory History of Phlogiston*, 33 ADMIN. L. REV. 195 (1981).

kind of modern epic poem, written by a fellow who had recently "due-processed to death." On page after page, Costle runs through an imaginary history of all the steps in the regulatory process that would be necessary if EPA were to attempt to regulate a substance like phlogiston. It is a funny article. But it is black humor, the anguished cry of someone who has found it very frustrating to be caught inside the cumbersome, legalistic process that we have created for making rules about the environment.

One should not be too pessimistic about our present lawmaking system in this area. A couple of years ago Barry Commoner, an environmentalist, created quite a stir when he wrote an article with the provocative title *The Failure of the Environmental Effort*.²⁹ *EPA: A Qualified Success* is a much fairer assessment.³⁰ We have made measurable progress in virtually every area that we regulate. And when you step back and compare the environmental effort to many of the other domestic policy efforts like the housing program, the war on poverty, education in the United States over the last decade, it looks pretty good by comparison. It has been relatively more successful than many of our other domestic initiatives. So I do not want to be misunderstood as saying that everything is black.

But I think that the simple reality is that the basic techniques that we use to regulate pollution in the United States today — the "command and control" system in which bureaucrats through informal rulemaking set standards on a substance-by-substance basis — is just not going to be adequate to deal with the problems that lie ahead.³¹

My colleague in the government, Dick Stewart, who formerly taught environmental law at Harvard, once referred to our basic approach to environmental protection in the United States as a version of Soviet-style central planning.³² And I think it is subject to some of the same difficulties that Soviet-style central planning has experienced in many other areas of the world. In particular

29. Barry Commoner, *The Failure of the Environmental Effort*, [18 News & Analysis] ENVTL. L. REP. (Envtl. L. Inst.) 10,195 (June, 1988).

30. Steven Cohen, *EPA: A Qualified Success*, CONTROVERSIES IN ENVIRONMENTAL POLICY 191 (1986).

31. See Brimelow & Spencer, *supra* note 15.

32. Richard B. Stewart, *Economics, Environment, and the Limits of Legal Control*, 9 HARV. ENVTL. L. REV. 1 (1985).

these sorts of techniques of bureaucratic planning and regulation, I think, are going to prove very difficult to use in the years ahead, in part because we have been cream-skimming: we have dealt with most of the easy sources: the large coal-fired utility boilers, the large chemical plants, the refineries. Most of the large, easily-regulated sources of pollution have already been subjected to very substantial pollution control requirements. The problems that we must face in the future have a very different profile: they are large numbers of small, diffuse sources that will prove very difficult to regulate using traditional techniques.³³

The pattern of large numbers of small sources applies to many pollutants today. One example is water pollution of surface streams. Over half the water pollution that is going into surface rivers now comes not from factories and sewage treatment plants, but from so-called "non-point sources," agricultural runoff, and other small sources.³⁴ It is going to be very difficult if not impossible to use the command-and-control techniques of centralized bureaucracy that we have used in the past to deal with large numbers of small sources. We are going to need to begin to deal with thousands of small sources, from the composition of consumer products to small businesses like dry cleaners. Even alkaline batteries, and other household products that contain small amounts of hazardous substances, can create problems when disposed of in municipal trash. Increasingly, we are going to have to deal with large numbers of small sources that simply are not amenable to bureaucratic control without ham-stringing the economy. Pogo's great line, "We have met the enemy and he is us," really describes the problems that we are going to face in the environmental area in the years ahead.

IV. ENVIRONMENTAL INCENTIVES AND THEIR PROBLEMS

Criticizing the present system is easy. Talking about what we ought to do in the future is the hard part.

One way to predict the future is to observe emerging trends and project them. Perhaps the most significant trend in environmental law today is the increasing use of incentives as opposed

33. Francis S. Blake, *The Economic Impacts of Environmental Regulation*, 5 NAT. RESOURCES & ENV'T 23 (1990).

34. See *Non-point Sources Seem to Play a Greater Role in Degrading Water Quality*, EPA Report Says, ENV'T REP., Nov. 13, 1987, at 1740.

to command-and-control regulation as a way of dealing with environmental problems. By incentives, I do not simply mean economic systems, like the trading system under the Clean Air Act for acid-rain. I am thinking about positive incentives and information incentives like the toxic release inventory as well as economic ones. But the future that I see in environmental regulation is one that is going to rely much more on incentive systems, diverse systems, and markets and much less on centralized command-and-control regulation.

Another major trend that I see developing is the so-called "pollution prevention movement," the notion that it is cheaper and better to prevent pollution by re-thinking the nature of products and systems rather than to clean it up after the fact or to slap a pollution control device at the end of the line. And a major incentive for pollution prevention has been the use of information as a regulatory technique. EPA has had a voluntary program called the "33/50 Program" in which companies have been asked to make a commitment to reduce their emissions of toxics into the environment by 33 percent by the end of the year 1992 and by 50 percent by the year 1995. And already, that voluntary program has over 500 companies signed up to make those commitments for reductions. The amount of pollution, that is, the amount of toxics that will not be going into the air and the water, is far in excess, I think, through that program of what we prevented through the regulatory system over twenty years.

Another major trend that I see is the notion of least cost pricing that is taking hold in California and also in Japan. The basic idea of least cost pricing is that our price signals do not fully reflect all of the costs, all of the potential externalities. So you go into the store and you buy an alkaline battery rather than a rechargeable battery because the alkaline only costs half as much as the rechargeable battery. But of course, it is not built into the cost of the alkaline battery that someday somebody may have to dig up the landfill which that alkaline battery and a hundred thousand others went into.

What California is trying to do, particularly in the utility area, is to try to figure out all of the costs of one option as opposed to another and build those all into the prices. Again, we can use incentives and markets to try and get some of the right signals. But unfortunately, incentive systems alone will not solve our problems.

V. IN SEARCH OF THE MORAL DIMENSION

Something more fundamental is at stake in environmental law than merely getting the price signals right for efficient use of resources; there is also an important moral dimension to environmental law that is often overlooked in much of the academic discourse.

Some of the most important aspects of environmental problems are the ones that we find very difficult to talk about, the moral issues that lurk just beneath the surface. This unspoken level can be glimpsed by considering some of our conversational taboos in the way that we talk about environmental issues. We frequently talk about environmental problems in ways that do not fully capture our real concerns.

Consider the Endangered Species Act. Some people will tell you that they want to protect endangered species from extinction because it might turn out that in some endangered species someplace there is the unknown cure for cancer, or something else that will be of great benefit to human beings.³⁵ But imagine a typical law professor's come-back: "Suppose that we could preserve a few examples of the species, one or two of them in a museum someplace, so that if we decided we really needed them we could reproduce a lot of them; would that satisfy you?" (I call that the Noah hypothetical.) Or: "Suppose you could program some of their genes into a computer so that you could duplicate them."

My experience is that students get angry at those hypothetical suggestions. I submit to you that the reason they get angry is because they do not really want to preserve endangered species just because they might turn out to be useful to human beings at some later date. There is something more basic, there is something more fundamental, behind their desire to preserve endangered species that they do not really feel comfortable talking about.

This is another, more subtle cost of the way we have approached environmental law. One of the consequences of the bureaucratic, standard-setting process is that it has impoverished our public dialogue about environmental issues by converting moral issues into technical ones. As we think about reforming the way we

35. See, e.g., Timothy Egan, *Trees That Yield a Drug for Cancer Are Wasted*, N.Y. TIMES, Jan. 29, 1992, at A1 (stating that bark of Pacific Yew is source of potent anti-cancer drug, taxol).

make and implement environmental law, we also have to think about developing a process that facilitates public dialogue about the real issues. There is no question that this dialogue must be informed by "good science," but it must also get to the level of the deeper values that underlie our attitudes toward the environment.

I want to maintain that the underlying problem is that our conventional understanding of what we really mean by "pollution," is insufficient. I do not mean it is wrong; I mean it just is not enough. It covers part of the problem, but it does not really tell us the whole story.

The conventional theory of what we mean by pollution, at least in the law schools, has been based on the problem of the commons, the famous article by Garrett Hardin about over-grazing.³⁶ Because people only bear a portion of the cost and they get all the benefits of putting an additional cow on the common, there is supposedly a tendency for them to put more and more cows on the common until the range is destroyed and everyone suffers. This basic metaphor, essentially an economic metaphor, based on the free-rider, market-failure problem, has become the basic paradigm that many of us have used to think about why pollution is a problem.

This economic view of pollution is very useful in some ways. But like all models, it brings certain aspects of a complex problem into focus by suppressing other facets of the problem. The economic definition of pollution captures the facet of the problem of the environment as a resource with many competing uses. It focuses on the environment as a scarce economic resource, a good, to be utilized by human beings. That is undoubtedly an important part of the story, but it is not all of the story. The economic view is useful, but it is also insufficient and I want to suggest a couple of reasons why it is insufficient.

One anomaly in the economic approach is that it views the environment as just another resource to be consumed by human beings. It is a necessary implication of the economic concept of pollution, that you can have too little pollution.³⁷ If you think about

36. Garrett Hardin, *The Tragedy of the Commons*, 162 *SCI.* 1243 (1968).

37. See Richard L. Stroup & John A. Baden, *NATURAL RESOURCES: BUREAUCRATIC MYTHS AND ENVIRONMENTAL MANAGEMENT* 87 (1983) ("If the law required that pollution be at a level where marginal pollution control costs exceed marginal damages, then society would lose because a more desired activity is being restricted too much. For instance, if eliminating

pollution solely as a problem of the mis-allocation of resources, then you can have too little pollution. Aggregate public welfare would be increased by trading a little more pollution for something else that would give society more utility. And yet the notion that there can be too little pollution does not really capture the intuitive sense that most of us feel. It is a deeply unsatisfying way to think, to imagine that the purposes of environmental law is to get just the right amount of pollution — not too much, and not too little.

Another way to see that the economic theory of pollution is inadequate is in terms of the Coase parable.³⁸ Coase's parable starts out with the example of a farmer and a rancher who live next door to one another, and focuses on the question of who ought to have to build the fence between the two. The point is that, in the absence of transaction costs, it will not matter whether the law puts the obligation to build the fence on the rancher or the farmer. In a case of efficient bargaining, you will get just as many fences built either way, because if it is worthwhile for the cattle rancher to have a fence built, he or she will pay the farmer next door to do it. One of the deeper points of Coase's parable is that from an economic perspective, it does not make sense to say that either the farmer or the rancher is causing the problem. The concept of a single cause just does not apply to two different competing uses of a single resource.

The Coasean analysis works pretty well when you are talking about two activities like cattle ranching and farming that are on the same level. The second example, though, which Coase gives in his article is of a polluter and the person next door who wants to breathe the air.³⁹ In that case, I think that the notion that these are just two competing uses, two equally valid competing demands to use the resource, just does not work nearly as well. This is a point that Bill Rodgers, who teaches environmental law at the University of Washington, has made.⁴⁰ Most of us would not feel that the right to breathe the air exists on the same normative level as the right to use the air as a garbage dump.

one unit of pollution reduces pollution damages by \$10 but the cost of controlling that unit is \$15, then pollution has been reduced too much.”)

38. Ronald Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960).

39. *Id.* See also Frank Michelman, *Pollution as a Tort*, 80 YALE L.J. 647 (1971).

40. William H. Rodgers, *Bringing People Back: Toward a Comprehensive Theory of Taking in Natural Resources Law*, 10 ECOLOGY L.Q. 205 (1982).

As we begin to understand the empirical and biological factors that underlie moral norms,⁴¹ it is increasingly apparent that some uses of resources have a higher normative value than others, that they are more likely to command mutual respect from the human community. The simple truth is that some uses of resources stand on something of a higher or more fundamental level than other competing uses of those resources. And this idea has found its way into our law in lots of areas. For example, in water law there has always been a preference for domestic use. There are a number of other areas where some uses are more equal than others.

What I draw out of these examples is that the use of the environment as a resource, the use of the environment as a good, the use of the environment as something that can be bought and traded in markets is certainly part of the story, but it is not everything that is going on. It is crucial that we understand the environment and pollution not just in resource terms as an economic good. The prevailing academic attitude stops there. We must also recognize that there are moral, and I want to suggest, even *religious* issues, that underlie our society's concerns about protecting the environment.

By "moral" I mean a normative commitment to certain entitlements, particularly the right to life and health. We do not protect people against theft only where it is cost effective to do so. We do not protect people against theft because aggregate efficiency will be enhanced or a mis-allocation of resources would occur. We protect them against theft because we think they have an entitlement not to have their property taken by other people. And I believe that much of the same logic underlies many of our commitments in the environmental law area.

The notion that people have certain minimal entitlements to a safe or clean environment became very clear in the debates in Congress over Title III of the Clean Air Act Amendments of 1990. Title III is the portion of the 1990 Clean Air Act that deals with air toxics. There was a clear commitment in the 1990 legislation, particularly in the Senate bill, that Congress was going to write in a minimum tolerable level of risk. They suggested a lifetime risk of death of one in a million. And they very clearly stated in that

41. See, e.g., Richard Alexander, *THE BIOLOGY OF MORAL SYSTEMS* (1987). See also R. Masters, *THE NATURE OF POLITICS* (1989); Margaret Gruter, *Law in Sociobiological Perspective*, 5 FLA. ST. U. L. REV. 181 (1977).

legislation, at least in the Senate version of it, that even if a single person was exposed to a risk greater than ten to the minus six, risk of death from toxic emissions, that the plant ought to be shut down.

Now I think that was a somewhat extreme legislation and I am glad it did not pass in quite that form, but I think that what was being expressed there is the notion that there are fundamental, moral, entitlements to a safe environment. And I think the law as it actually exists carries over many of those kinds of commitments in a somewhat more moderate form. It is EPA policy, as expressed in a ruling about benzene, that the goal of environmental protection ought to be to guarantee everyone that their risks are no greater than ten to the minus four, and to get as many people as you can down to a risk of one in a million.⁴² So I think there is the notion that there is a level of risk that is simply intolerable. In other words, what I am saying on the moral level is that I see not only a commitment to environmental protection as a resource or an economic matter, but also as a moral matter for some of the same reasons that we do not allow people to sell their kidneys or sell their children. We do not think it is appropriate that people should be involuntarily exposed to risks greater than a certain level. That is what I mean by the moral dimension.

The religious dimension is even tougher to pin down. I am using the term "religious" in a somewhat odd way because I do not have in mind a religion that is based necessarily on God or the notion of a Supreme Being, but it is a kind of deistic view. What I mean by religion is really that it is a theory that posits the role of human beings in the cosmos. It is a vision of who we are and what our obligations are and what our nature is. And in that sense I think environmentalism really is a religion.

There was a good article by McKibben in *The New Yorker* a couple of years ago about the meaning of nature.⁴³ In that article, he proposes that the fundamental thing about nature is its independence - That nature is not something that we can control, but that it is independent of us.

42. 54 Fed. Reg. 38,044 (1989). This approach is specifically approved by the Congress in the Conference Report to the 1990 Clean Air Act. See H.R. REP. No. 952, 101st Cong., 2nd Sess. 339 (1990) (conference).

43. Bill McKibben, *The End of Nature*, NEW YORKER, Sept. 11, 1989, at 47, 73 ("Nature's independence is its meaning").

That is a step in the right direction, but I do not think it goes quite far enough. The fundamental thing about nature is not only its independence of us, but also our dependence on it. That vision of the proper relationship between human beings and nature brought to the fore very clearly in some of the current debates about global warming.

I was at a conference in Berlin a couple of weeks ago and one of my American colleagues, Fred L. Smith, argued that global warming is actually a good thing, that it is going to bring about substantial benefits. He argued that as we increase carbon dioxide in the atmosphere, this will be good for plants, so agriculture is going to blossom and we are going to be able to feed the starving masses in the world and therefore, we should not be so concerned about global warming; we should welcome it. As you might imagine, the audience hooted, just as some of you did. Their minds absolutely rebelled from these ideas.

Another friend of mine suggested to me recently that there is a scientific theory that an ice-age comes to North America every 10,000 years because the earth wobbles on its axis, and when it tilts a certain way, an ice-age comes. According to this theory, we are just about due for another one, so global warming is actually a good thing, because it will give us another thousand years before the glaciers come, during which we can learn to populate the other planets.

Again, the mind rebels. My point is not whether these theories are true or not. My point is really that our minds rebel from even considering them. We just do not care whether they are true or not. Our real grounds for being concerned about global warming have very little to do with whether or not our best prediction is that global warming will create net benefits or net costs.

What is scary to many people about the thought of global warming is the very idea of human beings transforming the world's climate. We just do not think it is our business as a species to alter something as fundamental as the world's climate.

That is the underlying strand of environmentalism that I want to describe as fundamentally religious. Many of our western religions, from the Greek notion of hubris through the Garden of Eden, through the *Bonfire of the Vanities*, have as a central tenet that human beings just are not smart enough to think of everything, so they should not try to run the cosmos.

The fundamental notion that underlies the vision of environmentalism is the relationship between human beings and the

environment. In a brilliant book called *New World, New Mind*,⁴⁴ Robert Ornstein and Paul Ehrlich argue that human beings evolved to be able to deal with large sudden changes in their environment. When we were hunter-gatherers and you suddenly heard a noise in the bushes it might be a saber-toothed tiger. What our perceptions are not really set up to do is to deal with very small changes that take place very slowly in large systems.

One of the ways to understand what environmental protection has been about is to try to develop social institutions that compensate for the shortcomings in our individual perceptions so that we can begin to deal with some of those small and subtle changes in complex systems.

But I think it makes us very, very uncomfortable, it goes against the grain, it is something that we just do not feel is our place to do. I have recently written an article which I call *Against Ludditism*⁴⁵ and in that article I argue that those who would deal with this problem by trying to preserve things as they are, are really engaged in a fool's errand. I do not really think that is an option.

My colleague at Yale, Bill Cronon, an environmental historian, has written a brilliant book called *Colonists and the Land* that shows that human beings going back to the native Americans have dramatically changed the environment of the continent through their practices.

What history really teaches us about the future is that it is going to happen, whether we want it to or not. We do not have much alternative as a species but to be in the business of trying to manage the global environment. Our track record in dealing with these kinds of problems counsels modesty as we undertake these decisions.

To illustrate how difficult it is for human beings to manage complex systems, I sometimes ask my students why they do not think it is a good idea to have all corn plants have exactly the same genetic make-up. That is easy. They all understand the concept of genetic diversity, and they say, "What if the environment changes?" We are not smart enough to design a perfect corn

44. Robert Orstein & Paul Ehrlich, *NEW WORLD, NEW MIND: MOVING TOWARD CONSCIOUS EVOLUTION* (1989).

45. E. Donald Elliott, *Against Ludditism: An Essay on the Perils of the (Mis)use of Historical Analogies in Technology Assessment*, 65 S. CAL. L. REV. 279 (1991).

plant. If the environment changes in some way that we did not foresee, it could all be wiped out.

And that is what I mean by counseling modesty and diversity. Let me over-simplify what the energy policy of the United States has been over the past twenty years. In the 1960's we converted all of our coal-fired powerplants to oil. And then in the 1970's after the Arab oil embargo, we converted all of our oil-fired powerplants to coal. And then because of the acid rain problem in the 1980's, we are now engaged in converting all of those coal-fired powerplants to natural gas. Do you see any pattern here? Human beings are going to have great difficulty coming up with a single centralized vision of what we ought to do that is sufficiently smart enough and that we are comfortable with in the kind of management choices that we are going to face in the years ahead.

VI. TOWARD HYBRID INSTITUTIONS IN ENVIRONMENTAL LAW

So that is my diagnosis. Not only is the current system cumbersome, slow, expensive, and does not do a very good job of setting priorities, I do not think it captures a lot of the underlying sense that made us interested in preserving the environment in the first place.

To deal with a large number of sources of pollution, to set rational priorities among them, we are much more likely to rely on incentive-based systems in the future. But those incentive systems cannot be just economic. They also have to take into account the moral and religious dimensions of environmental protection. For that reason I think it is no coincidence that as far as I am aware, we have never adopted, to date, a pure incentive-based system for regulating the environment. It seems to me unacceptable that people can buy and sell the right to cause harm to other people.⁴⁶

We will probably continue in the future to have a hybrid system.⁴⁷ Where we have the information available to set a health

46. See STEVEN KELMAN, *WHAT PRICE INCENTIVES? ECONOMISTS AND THE ENVIRONMENT* (1981).

47. The idea of "hybrid systems" that combine command-and-control regulation and incentives is discussed in M. Breger, et al., *Providing Economic Incentives in Environmental Regulation*, 8 YALE J. ON REG. 463 (1991).

based standard, we will probably do that. But we will probably provide a system of incentives over and above the standards to try to provide an incentive to develop better technologies, to go further, to not just do the minimum that the law requires.

It seems to me to be no coincidence that the first major statute to use an incentive-based system for regulating pollution, namely the Acid Rain Trading System in the 1990 Clean Air Act, was this kind of a hybrid system, which did not replace the pre-existing system of standards but rather was built on top of it to provide a system of incentives to go further.

Focusing on the religious level as well as the economic level, I think any system for regulating pollution is going to have to be much more sensitive to uncertainties. I think the fundamental problem that we have in the environmental area is that it is terrorizing for us to acknowledge how little we really understand. We have to come face to face with the unknown, or fear of the unknown. In designing systems of regulation, we need to be much more sensitive than we have been in the past to building in incentives for developing better information in the future.

Well, the implication of these ideas is that basically we will have to continue to use standards where we have enough information to identify health risks that are really unacceptable. But the system will also have to be supplemented with incentives that provide dynamic incentives to reduce pollution where it is possible to do that and to develop better technologies to eliminate pollution, or to substitute one method of making a product or service for another, which is less harmful to the environment. The final criteria is to set sensible priorities, to allow trade-offs between one set of risks and another set of risks. It is a pretty tall order.

The system that I think meets those criteria best would be a system of charges for the substances that are being put into the environment. Such charges would be set in a rough-and-ready way based on categories. We could put the substances into relatively large categories and then associate charges that were relatively good proxy for the amount of environmental harm that those releases are causing would be. Then we would be making at least a step in terms of creating some incentives in the long run.

The other advantage of a system of environmental charges is that it gives people an incentive to make a decision as to whether or not it is worthwhile to develop better information. If you use some rough-and-ready charges, then you can say to people out in

industry or elsewhere, if we have got it wrong for this chemical, and it is really worthwhile, you develop the information and show us that the charge ought to be 2.5 rather than 3.7. So it provides dynamic incentives for people to decide where it is worthwhile to develop better information.

Talking about a system of standards and a system of charges or other incentives is not to suggest that is the whole solution. On the contrary, what we do in the legal system is probably only the tip of the iceberg. The rest of the iceberg is information and education. If we only obeyed the traffic signals when there was a police officer nearby, we would have chaos. We have forgotten that basic insight to some extent in the environmental area.

Developing and reinforcing a normative view that it is wrong to expose people involuntarily to risks in the environment where we can prevent it is a crucial part of the mission of environmental law. The notion that it is unwise and immoral for people to pollute the environment, are things that I think are very important for the legal system to cultivate.

VII. CONCLUSION

Let me close by suggesting that there can be no final answer to these problems. One of the things that makes environmental law interesting and significant is that it is a never ending quest to perfect the relationship between human beings and the world around them. Environmental law is one of the most ambitious uses of the legal process that human beings have ever tried to make, and increasingly this quest is taking place on a global level. The fundamental mission of environmental law is ultimately to make human systems more compatible with the fundamental order of the universe on which all human activity, including economic activity, depends.

