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Responding to Environmental Risk: A Pluralistic Perspective

ROBERT V. PERCIVAL*

LIMA, Peru, Jan. 5 (Reuters) - The International Committee of the Red Cross has been providing cigarettes for the smokers among the hostages being held by Marxist guerrillas [at the Japanese embassy in Peru], and other hostages have insisted on having non-smoking areas. 'We are taking in cigarettes, both Western and Japanese,' said Ronald Bigler, a Red Cross spokesman. 'We are trying to help the hostages make it through the day, to ease the ordeal.' But the Red Cross's supply of cigarettes to the hostages - along with food, water and fresh clothes - may have annoyed as many captives as it saved from withdrawal symptoms. Nonsmokers among the hostages insisted on establishing smoking and non-smoking areas, said Carlos Aquino Rodriguez, a hostage who was freed on Dec. 22.¹

Throughout history, our species has been forced to confront a multiplicity of perils, including many generated by fellow humans and others of natural origin. Wars, famines, and natural disasters threaten health in ways that are immediate and obvious. Today, humans also are concerned over far less conspicuous risks, such as the long-term health effects of exposures to toxic substances. Even hostages held by terrorists now deem it only reasonable that they be shielded from the

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1. *Non-smoking Sections for Hostages*, NEW YORK TIMES, Jan. 6, 1997, at A4.

risk and annoyance of exposure to second-hand smoke, as noted above.

Environmental law's explosive growth is a product of public demand for protection against environmental risks. While the regulatory infrastructure erected by these laws remains relatively young, recently it has come under unprecedented attack. Critics argue that contemporary regulatory priorities are seriously misplaced, wasting enormous resources responding to relatively trivial risks due to public alarmism.² They recommend giving greater decisionmaking authority to experts insulated from public pressure,³ requiring more detailed risk assessments and cost-benefit analyses as a prerequisite to regulation, and limiting or preempting common law liability for certain environmental risks.⁴

These criticisms have been debated extensively elsewhere,⁵ and it is not the purpose of this essay to repeat this debate. Instead this essay articulates a more pluralistic vision of regulatory policy that respects the historical roots of environmental law and the complementary relationship between regulation, common law liability and market forces. It discusses how the contemporary regulatory state emerged after the common law proved inadequate to control risks of widely dispersed, latent harm in the face of inevitable scientific uncertainty. Rather than imposing more detailed analytical thresholds that would return regulatory policy to a common law model, environmental policy should embrace preventative regulation while cultivating more flexible regulatory standards that harness the power of liability and mar-

2. See, e.g., STEPHEN BREYER, *BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION* (1993).

3. See Stephen Breyer, *Foreword: Beyond the Vicious Circle*, 3 N.Y.U. ENVTL. L. J. 251, 252 (1995).

4. See, e.g., Peter W. Huber, *Safety and the Second Best: The Hazards of Public Risk Management in the Courts*, 85 COLUM. L. REV. 277 (1985).

5. See, e.g., Robert V. Percival, *Regulatory Evolution and the Future of Environmental Policy*, UNIV. CHI. LEGAL FORUM (forthcoming 1997); David A. Wirth and Ellen K. Silbergeld, *Risky Reform*, 95 COLUM. L. REV. 1857 (1995); Cass R. Sunstein, *Congress, Constitutional Moments, and the Cost-Benefit State*, 48 STAN. L. REV. 247 (1996); Lisa Heinzerling, *Political Science*, 62 UNIV. CHI. L. REV. 449 (1995).

ket forces as mechanisms for controlling risk. The essay identifies recent trends that suggest that regulatory policy is beginning to move in this direction.

I. From the Common Law to the Contemporary Regulatory State

Federal regulation now has taken center stage in society's efforts to protect human health from exposure to environmental risks. Most of the laws that require the establishment of regulatory standards are of recent origin.⁶ During the last three decades an enormous volume of federal regulatory legislation was adopted in response to the public's desire to minimize involuntary exposure to risk. This goal, which has been pursued relatively consistently across broad (and diverse) swaths of public policy, is at the root of much federal environmental regulation. It also is consistent with the common law's emphasis on protecting against foreseeable harm. The rise of the modern regulatory state is largely a product of the difficulties faced by the common law in responding to risks of widely dispersed, latent harm, such as the harms caused by environmental pollutants and toxins.

Uncertainty is the very essence of the concept of risk, for risk involves harm that occurs in a probable fashion, affecting some, but not all of those exposed to a particular substance or activity. The pervasiveness of uncertainty concerning the ultimate effects of environmental pollutants and toxins is the primary reason why the contemporary regulatory state displaced the common law as the first line of defense for public health. The common law's requirement of individualized proof of causal injury is very difficult to satisfy in cases where environmental pollutants cause widely dispersed, latent harm.

Early in this century, the Supreme Court was called upon to umpire disputes concerning egregious interstate air and water pollution problems applying the federal common

6. For a history of the enactment of federal environmental legislation see Robert V. Percival, *Environmental Federalism: Historical Roots and Contemporary Models*, 54 MD. L. REV. 1141, 1160 (1995).

law of nuisance. In a case where a single massive source of air pollution had dramatically and visibly damaged the surrounding landscape, proof of causal injury was not a major problem.⁷ Yet, when the Justices became involved in adjudicating interstate disputes over the effects of raw sewage disposal, they became acutely aware of their inability to serve as a kind of judicial Environmental Protection Agency (EPA).⁸

In a few rare cases, federal law sought a regulatory solution to restrict the use of substances or activities thought to cause harm to human health or the environment. But these laws only addressed highly visible examples of acute harm. For example, one early law required the establishment of safety standards to prevent steamship boilers from exploding.⁹ In 1912, Congress passed the little known Esch-Hughes Act which imposed a federal tax on white phosphorus for use in match manufacturing.¹⁰ Congress created this tax because white phosphorus caused workers in match manufacturing plants to suffer phosphorus necrosis, a disease that dissolved their jaws into horribly disfigured mounds of puss, a problem so horrendously visible that President Taft felt compelled to address it in his State of the Union message in 1910.¹¹

Other problems were neglected because society was totally unaware of the risks generated by new technologies, particularly those that caused chronic harm only with long latency periods. For example, both tetraethyl lead and chlorofluorocarbons (CFCs) were invented by the same chemist, Thomas Midgley. Both were considered remarkable technological advances at the time. Midgley himself had been very concerned about health and safety. He tested thousands

7. See, e.g., *Georgia v. Tennessee Copper Co.*, 206 U.S. 230 (1907) (emissions from a copper smelter located on the Tennessee side of the Georgia border found to be a public nuisance with the Court subsequently issuing an injunction, *Georgia v. Tennessee Copper Co.* 237 U.S. 474 (1915)).

8. See, e.g., *New York v. New Jersey*, 256 U.S. 296, 313 (1921).

9. See Robert V. Percival, *Environmental Federalism: Historical Roots and Contemporary Models*, 54 MD. L. REV. 1141, 1149 (1995).

10. See *id.* at 1150.

11. See *id.* at 1151. At the time, Congress did not believe it had the constitutional authority simply to ban the use of white phosphorus, so it used federal taxing authority to respond to the problem.

of compounds and rejected many because of safety concerns before he settled on tetraethyl lead, not realizing that its introduction into gasoline would massively increase cases of lead poisoning over the next several decades.¹²

CFCs were a remarkable advance because that greatly improved the safety of refrigeration technology, which formerly had caused many deaths as a result of the unstable chemicals that had been used in previous refrigerators. They also greatly expanded society's capacity to preserve food and to transport it safely over long distances. Yet, at that time no one ever thought that CFCs ultimately would threaten to destroy our ozone layer. It was not until the early 1970s that, almost entirely by accident, two scientists writing an environmental impact statement for the space shuttle came up with a theoretical calculation showing that CFCs could in fact create a chemical reaction that would threaten to destroy the ozone layer.¹³

Earlier in this century, concerns about the health effects of new technologies were addressed by convening conferences of experts. For example, after dozens of workers died of lead poisoning at the first tetraethyl lead plant, the public outcry that ensued led to the convening of a Surgeon General's conference in 1923. This provided a forum for public health and technology experts to consider whether the government should ban the use of tetraethyl lead as a gasoline additive. After quick studies of the health of workers at filling stations that used leaded gasoline reached inconclusive results, tetraethyl lead was given a green light without any appreciation of the serious neurological damage that lead emission ultimately would generate on a massive scale.¹⁴

Beginning in the late 1960s, environmental law began a swift transformation from a common law system to a regula-

12. This history is recounted in detail in SETH CAGIN & PHILIP DRAY, *BETWEEN EARTH AND SKY: HOW CFCs CHANGED OUR WORLD AND ENDANGERED THE OZONE LAYER* (1993).

13. RICHARD E. BENEDICK, *OZONE DIPLOMACY* 10 (1991).

14. This experience is recounted in David Rosner and Gerald Markowitz, *A "Gift of God"?: The Public Health Controversy over Leaded Gasoline during the 1920s*, 75 *AMER. J. PUBL. HEALTH* 344 (1985).

tory one that relies on administrative agencies such as the EPA. These agencies are authorized to issue regulations designed to prevent harm before it occurs. However, as the above examples illustrate, it often is difficult to forecast accurately the environmental effects of new substances or technologies. Thus, it was essential for courts to grant agencies the leeway to act even in the face of considerable scientific uncertainty.

This is illustrated by one of the landmark decisions in environmental law, *Ethyl Corporation v. EPA*.¹⁵ In *Ethyl*, fifty years after the introduction of tetraethyl lead into gasoline, the D.C. Circuit considered a challenge to EPA's first regulations limiting the amount of lead that could be added to gasoline. By a 2 - 1 vote the court initially struck down the regulations. Lead poisoning was a widespread problem and EPA could calculate that gasoline combustion released a tremendous amount of lead into the environment. However, the majority of the three-judge panel held that EPA could not limit the lead content of gasoline until it could prove that specific harm actually had occurred, harkening back to a common law standard of proof of causal injury.¹⁶

The D.C. Circuit then took the case *en banc* and reversed by the barest of margins: 5 - 4. The Court's *en banc* decision, written by Judge J. Skelly Wright, concluded that it was not necessary to show that actual harm had occurred before lead additives could be regulated.¹⁷ Noting that precautionary regulation would be "impossible" if courts demanded "rigorous step-by-step proof of cause and effect," the court held that agencies could act to prevent harm even in the face of uncertainty by using the available evidence to make rational assessments concerning potential risks.¹⁸ The precautionary principle reflected in this decision served as a model for fu-

15. *Ethyl Corp. v. EPA*, 541 F.2d 1 (D.C. Cir. 1976) (*en banc*).

16. See the discussion in *Reserve Mining Co. v. EPA*, 514 F.2d 492, 519-20 (8th Cir. 1975) (*en banc*). Articles critical of the initial panel decision are cited in the D.C. Circuit's subsequent *en banc* decision in *Ethyl Corp. v. EPA*, 541 F.2d 1, 11 n.13 (D.C. Cir. 1976) (*en banc*).

17. See *Ethyl Corp. v. EPA*, 541 F.2d 1, 28 (D.C. Cir. 1976) (*en banc*).

18. See *id.*

ture federal regulatory policy. It also permitted regulators to gather the data that later made a compelling case for removing *all* lead from gasoline.¹⁹

Four years later, the U.S. Supreme Court established limits on the ability of agencies to engage in precautionary regulation. In a 1980 case commonly referred to as the *Benzene* decision, the Court declared that it was not enough simply to find that a substance caused harm before regulating it to the limit of feasibility. Instead, agencies first have to determine that the risks posed by a regulatory target are "significant" and that the contemplated regulatory action would appreciably reduce them.²⁰ While the Court's decision was embodied in a plurality opinion that addressed statutory language unique to the Occupational Safety and Health Act (OSHA), ultimately it has created a kind of federal common law directing agencies to conduct quantitative risk assessments prior to taking regulatory action.²¹

While the *Ethyl* and *Benzene* decisions define the legal contours of precautionary regulation, they do not provide a clear answer to the quintessential question of modern regulatory policy: how much proof of harm is required before an agency can regulate? While *Ethyl* indicates that agencies need not wait for the kind of individualized proof of causal injury that the common law would require, *Benzene* requires them to do more than simply identify potential hazards - they must quantify them, if possible, and determine that they are significant and can be appreciably reduced. Whether this would permit an agency to stop the introduction of yet an-

19. See ELLEN K. SILBERGELD AND ROBERT V. PERCIVAL, *THE ORGANOMETALS: IMPACT OF ACCIDENTAL EXPOSURE AND EXPERIMENTAL DATA ON REGULATORY POLICIES*, IN *NEUROTOXICANTS AND NEUROBIOLOGICAL FUNCTION* (H. Tilson & S. Sparber, eds. 1987).

20. See *Industrial Union Department, AFL-CIO v. American Petroleum Institute*, 448 U.S. 607 (1980).

21. In 1981, the Supreme Court clarified that agencies were not required to base their regulatory decisions on the use of cost-benefit analysis. *American Textile Manufacturers Institute, Inc. v. Donovan*, 452 U.S. 488 (1981). However, the *Benzene* decision stimulated government agencies, including EPA, to conduct quantitative risk assessments before imposing costly regulations on industries, substantially increasing the informational threshold for issuing environmental regulations.

other toxic metal into gasoline without detailed proof concerning the adverse health effects of elevated ambient concentrations of that substance remains in dispute today.²²

As a practical matter, the difficulties regulatory agencies face in issuing standards has undermined environmental law's promise of preventative regulation. Even in the absence of legislation requiring agencies to base decisions on cost-benefit analysis, some federal courts have interpreted existing regulatory statutes to place seemingly impossible analytical requirements on agencies. For example, EPA labored for ten years to develop a comprehensive rule to phase out all remaining uses of asbestos.²³ The agency decided that this approach was far more efficient than continuing to try to prevent human exposure to asbestos throughout the life cycle of products in which it is used because asbestos poses a substantial risk of life-threatening diseases even at very low levels of exposure. EPA found that there were adequate substitutes available for most remaining uses of asbestos and that substitutes would be developed for the others, in the face of a technology-forcing regulation.²⁴ Despite EPA's extensive cost-benefit analysis, the Fifth Circuit struck down this regulation on the ground that the agency had not analyzed all the costs and benefits not only of an asbestos ban, but of all intermediate alternatives,²⁵ oblivious to the agency's conclusion that only a phaseout could adequately control the risks. This decision is widely viewed as a "death knell" for comprehensive preventative regulation on a multimedia basis under the Toxic Substances Control Act (TSCA).²⁶

22. See Kevin L. Fast, *Treating Uncertainty as Risk: The Next Step in the Evolution of Environmental Regulation*, 26 ENV. L. REP. 10627 (1996) (arguing that EPA's use of safety factors in reference concentrations for assessing the risks of allowing a manganese additive into gasoline shifts to a "guilty until proven innocent" standard for toxic chemicals).

23. See *Asbestos: Manufacture, Importation, Processing, and Distribution in Commerce Prohibitions*, 54 Fed. Reg. 29,460 (1989).

24. See *id.*

25. See *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201, 1229-30 (5th Cir. 1991).

26. Toxic Substances Control Act, 15 U.S.C. §§ 2601-2692 (1996).

Another significant initiative to overcome the chemical-by-chemical approach to regulation was struck down by the Eleventh Circuit in a case known as the *Air Contaminants* decision.²⁷ This case involved the effort by OSHA during the Bush administration to update in a comprehensive fashion its 400 permissible exposure limits for toxins in the workplace. OSHA did not seek to adopt unreasonably stringent standards, but rather simply to bring its admittedly outdated regulations up to the levels of current industry consensus standards. Yet the Eleventh Circuit held that OSHA must perform individualized risk assessments for each chemical and feasibility assessments for each industry subsector before it could adopt such a regulation.²⁸ This decision erects such a high informational threshold for regulation as to make it virtually impossible for OSHA even to update the vast majority of its standards.²⁹ This further undermines the ability of agencies to protect public health through preventative regulation.

II. Expertise, Public Perceptions, and Regulatory Decisionmaking

Much of the current debate over risk regulation is a product of sharply different visions concerning the rationality of public perceptions of environmental risk. Those who focus largely on quantitative risk assessments argue that regulatory priorities are misplaced because the public is too concerned about some risks that are statistically smaller than others.³⁰ EPA's own expert risk assessors have found that the agency's regulatory priorities are more closely aligned with the relative strength of public concerns over certain risks than with the products of their comparative risk assess-

27. *AFL-CIO v. OSHA*, 965 F.2d 962 (11th Cir. 1992).

28. *See id.* at 975-76.

29. *See* Dennis J. Paustenbach, *OSHA's Program for Updating the Permissible Exposure Limits (PELs): Can Risk Assessment Help "Move the Ball Forward?"*, 5 *RISK IN PERSPECTIVE* 1 (Jan. 1997).

30. *See, e.g.*, STEPHEN BREYER, *BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE REGULATION* 20 (1993).

ments.³¹ Yet risk regulation choices implicate a far richer mix of values than simple comparisons of statistical estimates of lives saved. These include the voluntariness of exposures to risks, fairness in the distribution of risks, uncertainty, the potentially catastrophic nature of certain risks, environmental damage and non-fatal health effects.³²

What is striking about this debate is that economists, whose discipline traditionally has not questioned the rationality of consumer preferences, have been among the harshest critics of the public's regulatory priorities.³³ Rather than viewing harmony between current regulatory priorities and public preferences as a sign of a functioning, pluralistic democracy, these critics decry it as a misallocation of societal resources because the public seemingly places a higher value on controlling certain risks than cost-benefit analyses do.³⁴ This is not meant as an indictment of economics, for that discipline recently has made significant advances in developing a richer understanding of the factors that shape consumer preferences. Incorporating lessons from psychology and experimental studies,³⁵ rational choice theory is moving away from the traditional expected utility maximization model to-

31. U.S. ENVIRONMENTAL PROTECTION AGENCY, UNFINISHED BUSINESS: A COMPARATIVE ASSESSMENT OF ENVIRONMENTAL PROBLEMS (1987); U.S. ENVIRONMENTAL PROTECTION AGENCY, REDUCING RISK: SETTING PRIORITIES AND STRATEGIES FOR ENVIRONMENTAL PROTECTION (1990).

32. See Victor B. Flatt, *Should the Circle Be Unbroken?: A Review of the Hon. Stephen Breyer's BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION*, 24 ENV. L. 1707 (1994); Lisa Heinzerling, *Political Science*, 62 UNIV. CHI. L. REV. 449, 471 (1995); Adam M. Finkel, *A Second Opinion on an Environmental Misdiagnosis: The Risky Prescriptions of BREAKING THE VICIOUS CIRCLE*, 3 N.Y.U. ENVTL. L. J. 295, 321 (1995).

33. See, e.g., Robert Hahn, *Achieving Real Regulatory Reform*, 1997 UNIV. CHI. LEGAL FORUM (1997).

34. See *id.* While Hahn argues that the public would make different choices if they were more aware of the true costs and benefits of regulation, he underestimates the degree to which estimates of the costs and benefits of regulation were considered when regulatory legislation was adopted. See Robert V. Percival, *Regulatory Evolution and the Future of Environmental Policy*, 1997 UNIV. CHI. LEGAL FORUM 1.98 (1997).

35. See Colin Camerer, *Behavioral Decision Theory*, in THE HANDBOOK OF EXPERIMENTAL ECONOMICS (John H. Kagel & Alvin E. Roth, eds. 1995); Eldar Hafir, Itamar Simonson & Amos Tversky, *Reason-Based Choice*, 49 COGNITION 11 (1993).

ward one that understands the importance of context and endowment effects in shaping consumer values and preferences.³⁶

Arguments that regulatory policy should place more weight on quantitative analyses conducted by "experts" than on the public's assessment of risks must appreciate the tremendous uncertainty that surrounds analyses of the prospective effects of regulation. Often it has proven to be the case that risks are more serious than previously thought and that the costs of regulation are far less than *ex ante* estimates. There are numerous examples of these phenomena. At the time of the *Ethyl* decision, the recommended safe level for lead in childrens' blood was forty micrograms per deciliter. Subsequently, it has been lowered to between ten and fifteen micrograms per deciliter because scientists have learned a lot more about the extent to which very low levels of lead can cause neurological damage.³⁷ Scientists also discovered that low levels of lead cause other types of health damage by increasing blood pressure in adult males. In addition, it is now well known that the phaseout of lead additives in gasoline, which was initiated by EPA during the Reagan Administration, cost far less than any *ex ante* estimate.

CFCs are another good example. A recent study estimates that there are 1.5 million fewer skin cancer cases each year in the United States alone because of international action to phaseout the use of these substances.³⁸ At the same time, the cost of complying with the phaseout has plunged dramatically. In 1988, a partial phaseout of CFCs to a 50% reduction, was estimated to cost about twice as much as an estimate for an accelerated total phaseout of CFCs four years later.³⁹

36. See Mark Kelman, Yuval Rottenstreich & Amos Tversky, *Context-Dependence in Legal Decision-Making*, 25 J. LEGAL STUDIES 287 (1996).

37. See ROBERT V. PERCIVAL ET AL., *ENVIRONMENTAL REGULATION: LAW, SCIENCE & POLICY* 631 (2d ed. 1996).

38. See Harry Slaper et al., *Estimates of Ozone Depletion and Skin Cancer Incidence to Examine the Vienna Convention Achievements*, 384 NATURE 256 (1996).

39. See Percival, et al., *supra* note 37, at 1282.

More recently, the *ex-post* cost-benefit analyses that have been conducted of the 1990 Clean Air Act Amendments⁴⁰ suggest that there have been enormous societal benefits that were not appreciated at the time the legislation was adopted despite the vocal opposition of many economists. One example of how the costs of the 1990 CAAA have proven to be far less than originally estimated is provided by the emissions allowances for sulfur dioxide, which the CAAA allow to be traded in the open market. When Congress decided to adopt the system of emissions allowance trading, it was estimated by industry that it would cost about \$1000 - \$1500 per ton to reduce sulfur dioxide emissions. Now that emissions allowances are trading on the open market, they are selling for around \$100 per ton.

It is not surprising that society frequently underestimates prospective risks while overestimating prospective costs. Estimates of risk depend upon what risks are assessed. Until there is a reason to suspect that a substance or activity might create certain kinds of risks, such as the risk CFCs posed to the ozone layer or the effect of lead on blood pressure, prospective risk assessments have no reason to consider such effects. With respect to the costs of regulation, business interests have a tremendous incentive to avoid regulations that may increase their costs. Thus, they often engage in strategic behavior to forestall regulation by exaggerating estimates of the likely costs of regulation. Moreover, until regulations actually are adopted and implemented, there is little incentive for developing new technology that would reduce the cost of complying with more stringent environmental standards.⁴¹

Opportunities for public policy to intervene to protect against risks are episodic and often depend on seemingly random political factors that make particular risks salient regulatory targets at certain moments in time. When this occurs, prospective estimates of risks and costs should be viewed as

40. Clean Air Act Amendments of 1990 (CAAA), Pub. L. No. 101-549, 104 Stat. 2399 (1990).

41. See Finkel, *supra* note 32, at 369-71.

dynamic and subject to revision over time, rather than as the foundation for one-time, all-or-nothing regulatory decisions. Ultimately, an even-handed regulatory policy that seeks to improve the public's understanding of risks and the costs of controlling them may offer the best hope for improving regulatory priorities by influencing what issues command policy-makers' attention.⁴²

Despite criticism of the public's risk perceptions, people are becoming more sophisticated in their attitudes toward risk. The concern of the hostages held at the Japanese embassy in Peru over second-hand smoke is well founded, as confirmed by recent studies.⁴³ Indeed, the current remarkable groundswell of concern over the risks of smoking and the role of tobacco companies in promoting this deadly addiction paints a brighter picture concerning the public's capacity to absorb information about environmental risk, particularly when responsible government policy seeks to play a leadership role in informing public opinion.⁴⁴

One may legitimately question who the real "experts" are. Rather than a high priesthood of quantitative risk assessors, the public may do a better job of assessing some risks and it may respond more quickly than the regulatory system when information about risks becomes available. The history of CFC regulation demonstrates that it was the public who simply stopped buying aerosol spray cans, propelling the United States to deal with that risk in the early 1970s, a decision that proved remarkably prescient.⁴⁵ In similar fashion, the environmental groups who pushed for elimination of lead

42. See Robert V. Percival, *The Ecology of Environmental Conflict: Risk, Uncertainty and the Transformation of Environmental Policy Disputes*, 12 *STUDIES IN LAW, POLITICS, AND SOCIETY* 209 (1992) (discussing how environmental policy disputes get on the public agenda and means for improving the public's understanding of environmental risk issues).

43. Denise Grady, *Study Finds Secondhand Smoke Doubles Risk of Heart Disease*, *NEW YORK TIMES*, May 20, 1997, at A1.

44. Kevin Sack, *For the Nation's Politicians, Big Tobacco No Longer Bites*, *NEW YORK TIMES*, Apr. 22, 1997, at A1.

45. See Joby Warrick, *Disaster Averted, Experts Say*, *WASH. POST*, Nov. 21, 1996, at A2 (reporting on study finding that phaseout of ozone-depleting substances has prevented 1.5 million cases of skin cancer each year in the United States alone).

from gasoline in the early 1970s could be considered more "expert" in their armchair risk assessments because they advocated something that took nearly two decades to accomplish, but which is now widely viewed as one of the most dramatic environmental success stories. Progress toward improved public confidence in our regulatory system will only continue if we continue to pursue a pluralistic approach to public policy that affords the public substantial input into decisions concerning how to respond to environmental risks. It will not occur if we move instead toward a system that empowers a group of so-called experts insulated from the political process to decide how to respond to risk.

III. Emerging Trends in Regulatory Policy

Regulatory policy appears to be moving in several positive directions. Concern that regulatory policy often is inflexible and unfair in its application⁴⁶ has spawned efforts to "reinvent regulation" and other initiatives that are moving regulatory policy toward some of the values that animated its common law roots. Regulators are exhibiting a greater willingness to modify standard default assumptions in risk assessments in circumstances where they can be shown to be inappropriate.⁴⁷ They are now focusing more on fairness to individuals, particularly individuals who are the most sensitive to environmental risks.⁴⁸ As a result of the growing "en-

46. See Philip K. Howard, *THE DEATH OF COMMON SENSE: HOW LAW IS SUFFOCATING AMERICA* (1994).

47. A report released by the Commission on Risk Assessment and Risk Management in June, 1996 recommends a system where it will be possible, in certain circumstances, to relax some of the default assumptions that typically go into risk assessments, if it can be demonstrated that there are good reasons in an individual case for believing that the normal assumptions about extrapolating from animal tests to humans are not valid. Michael Baram, *Risky Business*, 104 ENVTL. HEALTH PERSP. 1040 (1996).

48. For example, the Food Quality Protection Act of 1996, Pub. L. 104-170, 110 Stat. 1489 (1996), requires EPA to give special attention to the risks of sensitive populations such as children exposed to pesticides. See James D. Wilson, *Resolving the "Delaney Paradox,"* RESOURCES 14 (Fall 1996). It also requires EPA to assess the risks of endocrine disruption, a growing concern among scientists. In April 1997, President Clinton issued an executive order directing all federal agencies to identify and address environmental risks that

vironmental justice" movement, regulatory policy is becoming more concerned over how to protect (and compensate) those upon whom risk is disproportionately concentrated.⁴⁹

One of the most encouraging trends is the growing recognition that regulation is only one of a larger set of tools society can use to manage environmental risks. Common law liability, market forces, and environmental regulation are highly complementary mechanisms for helping society cope with risk. Each has its distinct advantages and drawbacks. Thus, the best strategy for society to address the portfolio of risks it faces is to employ the three in a combination that emphasizes the strengths of each.

Market forces can play an important role in protecting human health by generating economic incentives for minimizing involuntary exposure to risk, particularly in circumstances where consumers are informed of risks and can choose to avoid them by altering their consumption behavior.⁵⁰ While our current regulatory infrastructure emerged in response to the perceived inadequacies of the common law for responding to environmental risk, common law principles also retain enormous vitality in society's overall risk reduction policy, as Professor Marshall Shapo explains.⁵¹ The common law reflects social judgments concerning the morality and efficiency of activities that affect others⁵² and it enables judges to assess the reasonableness of risks despite the enormous uncertainties that bedevil quantitative risk assess-

may disproportionately affect children. Exec. Order No. 13,045, 62 Fed. Reg. 19,885 (1997). This order creates an interagency Task Force on Environmental Health Risks and Safety Risks to Children to advise the President on how to respond to such risks.

49. See Exec. Order No. 12,898, 59 Fed. Reg. 7,629 (1994).

50. Regulatory policy is now seeking to enhance the power of the marketplace by requiring far more extensive public disclosures of information concerning potential risks. The Emergency Planning and Community Right-to-Know Act, 42 U.S.C. §§ 11001-11050, and the toxic release inventory it created now provide the public with unprecedented information about releases of toxic chemicals.

51. Marshall S. Shapo, *Tort Law and Environmental Risk*, 14 PACE ENVTL. L. REV. 801 (1997).

52. Jonathan Bender, *Societal Risk Reduction: Promise and Pitfalls*, 3 N.Y.U. ENVTL. L. J. 255, 266-67 (1995).

ment.⁵³ While the common law generally looks backward in assessing the reasonableness of events that already have transpired,⁵⁴ these judgments can have a powerful effect in shaping future conduct by articulating what society considers to be reasonable. When regulators neglect to control risky activities that cause widespread harm, the common law is society's primary vehicle for responding, as illustrated by the asbestos tragedy⁵⁵ and the recent flurry of litigation against the tobacco industry.⁵⁶

IV. Conclusion

Public demand to prevent involuntary exposure to risk has produced a comprehensive set of environmental laws that authorize agencies to issue preventative regulations. While regulatory policy has fallen short of the law's promise of comprehensive protection, transferring greater regulatory authority to experts insulated from public pressure would not ensure improved policy, but could undermine public confidence in the regulatory system. Recent developments appear to be moving us towards a regulatory system that places more emphasis on regulatory fairness and more individualized determinations of risk. This moves environmental regulation closer to some of the values that animated common law standards, while seeking to preserve the benefits of preventative regulation. These and other developments are amplifying the complementary nature of the common law, market

53. See Shapo, *supra* note 51.

54. To be sure, the common law does have doctrines of anticipatory nuisance, but the difficulty of forecasting environmental damage has meant that, for the most part, common law liability attaches only after harm has become manifest.

55. See, e.g., David Rosenberg, *The Dusting of America: A Story of Asbestos - Carnage, Cover-up and Litigation*, 99 HARV. L. REV. 1693, 1695 (1986) (describing the tort system "as the uniquely effective means of exposing and defeating the asbestos conspiracy, providing compensation to victims and deterring future malfeasance.")

56. The long history of the tobacco industry's successful efforts to avoid effective regulation is discussed in detail in RICHARD KLUGER, *ASHES TO ASHES: AMERICA'S HUNDRED-YEAR CIGARETTE WAR, THE PUBLIC HEALTH, AND THE UNABASHED TRIUMPH OF PHILIP MORRIS* (1996).

forces and environmental regulation as mechanisms for controlling environmental risk.

As this essay goes to press, the pluralistic nature of society's response to environmental risk is being illustrated in dramatic fashion by the tobacco industry's stunning decision to agree to a \$368 billion settlement of liability claims.⁵⁷ While the fine print is just beginning to surface, the magnitude of the proposed settlement reaffirms the common law's vitality as a vehicle for addressing risks that had escaped effective regulation.⁵⁸ Moreover, a veritable sea change in public opinion toward the tobacco industry may illustrate how responsible government policy can help shape public attitudes towards risk. With improved public understanding, regulatory policy is capable of amplifying the power of common law liability and market forces to protect against environmental risks, creating additional opportunities for improving the fairness and efficiency of public policy.

57. John M. Broder, *Cigarette Makers in a \$368 Billion Accord to Curb Lawsuits and Curtial Marketing*, *NEW YORK TIMES*, June 21, 1997, at A1.

58. Perhaps the most revealing index of the common law's power is the enormous energy that has been expended on behalf of efforts to restrict tort liability. Indeed, the proposed tobacco settlement has forced advocates of such "tort reform" measures to scramble to modify them for fear that they would insulate the industry from liability that it was now willing to accept. See Suein L. Hwang, *Deal Is Close in Tobacco Negotiations*, *WALL ST. J.*, June 13, 1997, at A3 (reporting an effort in Congress to exclude tobacco products from proposed legislation to cap punitive damages in response to concerns expressed by 16 state attorneys general that it would undercut their negotiating position in the tobacco settlement talks). In June 1997, California, which had enacted legislation giving the tobacco industry immunity from products liability suits, repealed the law and joined 36 other states in suing the industry. Milo Geyelin, *California is 37th and Biggest State to Sue Tobacco Industry for Costs*, *WALL ST. J.*, June 13, 1997, at B9.