Lost in the Translation: What Environmental Regulation Does That Tort Cannot Duplicate

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I. INTRODUCTION

The Philips Lighting Company markets an 85-watt light bulb. The package claims that the bulb "replaces 100-watt [bulbs]." Asterisks after this statement lead the careful purchaser to the following note: "Provides 23% less light output than the 100-watt bulb it replaces."[1] That curious admission prompted *Consumer Reports* to ask, "With that kind of reasoning, why couldn't a 60-watt bulb 'replace' a 200-watt bulb?"[2]

When the magazine asked Philips that question, a company representative told the magazine that "[w]e don't make a 100-watt bulb, so we suggest you could replace your 100-watt bulb with this one. We're offering it as a replacement, but it doesn't really replace it 100 percent."[3]

The thesis of this essay is that tort law is an alternative to environmental regulation in much the same way as Philips' 85-watt light bulb is an alternative to a 100-watt bulb. It cannot replace environmental regulation 100 percent.

Three main sections follows this Introduction. Section II argues that environmental regulation differs from tort in three critical respects - one procedural, one remedial and one substantive - which prevent the one from replacing the other. With respect to process, environmental regulation determines levels of environmental quality through public processes and collective choices, rather than as the aggregation of a series of private decisions. With respect to remedies, environmental regulations seeks prevention rather than cure. With respect to substance, the levels of environmental quality that our current environmental regulatory system embodies cannot be achieved under current tort standards, because the collectively chosen levels differ from the cost-beneficial levels of environmental quality tort is geared to achieve.

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1. *Selling It; Dim Bulb*, CONSUMER REPORTS, Nov. 2001, at 67.

2. *Id.*

3. *Id.* When the magazine observed that "replace" was a misleading word in this context, the representative did acknowledge that, "It's not maybe a good word." *Id.*

These two regimes must also be evaluated in practical terms. We want a regime that will actually achieve good environmental quality results, and certainly the present environmental regulatory system falls far short of achieving the goals that have been set for it.[4] In other words, an actual tort system, even if not designed with the modern ends of environmental regulation in view and even if not using public processes to make environmental quality decisions, might nevertheless be superior to an actual regulatory regime. While this essay does not undertake a full comparative analysis of the two regimes, Section III does explore some reasons to be skeptical that even the best functioning tort system would be able to address certain types of environmental problems in a satisfactory manner. Section III divides environmental disputes into four idealized categories, arguing that tort can cope with some of these better than others. In particular, tort faces enormous difficulties in resolving disputes over environmental risks that have diffuse origins as well as diffuse effects.

Section IV briefly suggests that of the common law regimes, property regimes will have as much to offer environmental regulation in the years ahead as will tort. The essay ends with a brief conclusion.

II. Process, Remedy and Standards: Three Differences Between Tort Law and Environmental Regulation

Proponents of tort over environmental regulation routinely criticize regulation for its highly centralized structure of command-and-control, which micro-manages how individual pollution sources must behave. They contrast this with tort's decentralized structure, which is responsive to local variations and able to take advantage of local knowledge. It can hardly be denied that environmental regulation as practiced under many American environmental statutes remains heavily oriented toward a command-and-control style of implementation. Command-and-control, however, is but one type of environmental regulation. For example, environmental statutes may be implemented, and increasingly are implemented, through regulatory structures emphasizing market-based or incentive-based regimes, whereby allowable emissions are traded among sources.[5] These and other such regimes give individual sources much more flexibility, insofar as they

4. Although progress has been made under most of our national pollution statutes, analysis of that progress shows that the regulatory system leaves much still to be desired. *See, e.g.*, J. Clarence Davies & Jan Mazurek, Pollution Control In the United States: An Evaluation (1998). Regulatory standards on the books often fail to live up to the bold promises made by the statutes themselves. In addition, there is much slippage between those standards and the actual performance of regulated parties. *See* Daniel A. Farber, *Taking Slippages Seriously: Non-compliance and Creative Compliance in Environmental Law*, 23 Harv. Envtl. L. Rev. 297, 298 (1999).

5. Some of the merits of such systems of regulation are discussed in Section IV.

can trade "rights to pollute" among themselves, thereby in principle achieving least-cost means of pollution reduction.

So there is more than one way to implement environmental standards via regulatory systems. Taking command-and-control as paradigmatic of all such regulation, and then making invidious comparisons between it and tort, deflects attention toward non-essential differences between the two regimes and obscures truly basic structural differences between them. The first such basic difference relates to the processes through which desired levels of environmental quality are established. A regulatory regime establishes the amount of environmental degradation legally permitted through a collective or public decision-making process, whereas tort law establishes that amount through a private law process of judicial application of general principles to particular cases. Tort law still applies community or collective norms, often under a rubric of "unreasonableness." Those norms, though, are spelled out through an iterative process of individualized litigation, not through an intentional decision of some public entity.

The key to this distinction is the public versus private identification of environmental quality levels, not the fact that private actors sue each other in the private case instead of using administrative or legislative procedures in the public case. Private litigation might well be used to supplement or supplant a public enforcement scheme that operates through bureaucracies, inspectors, administrative compliance orders, administrative law judges and the like. The citizen suit provisions that can be found in almost all pollution related statutes are intended to do just this. Citizen suits, however, are limited to enforcing standards established by the regulatory process. Private litigation that uses statutory or regulatory violations as negligence *per se* can also supplement public enforcement. There are many things to be said in connection with the possibilities of private versus public enforcement of the public standards, but such forms of litigation do not set those standards.

The decision to replace a collective decision regarding environmental standards with private ones is itself going to be a collective decision, and one that will require some justification to the public, which will be relinquishing a significant authority. Two types of arguments might be made in favor of such a change. First, one's theory of rights, responsibilities and governance might argue for resolving environmental disputes solely by private parties to a lawsuit. Such an argument would not rely upon any description of the physical or environmental consequences of litigation. Rather, individual outcomes to litigation would be justified solely on the basis of a claim that the correct procedures for resolving it had been followed, whatever

the outcome might be. In contrast, a second kind of argument for substituting tort for regulation does rely on consequences. One might claim that the consequences of tort law will approximate the environmental quality levels that the collective desires or should appropriately be seeking. Decentralizing dispute resolution would in that case be justified as a means to a collectively congenial end. Tort law might have this pleasing consequence, furthermore, even if the underlying motivations and ends of tort law itself were in significant respects autonomous from influence by the collective selection of desired results.[6]

The first type of argument does not work. Many of our concerns are exacerbated precisely because the interests taken into account in private transactions affecting the environment are too narrow to encompass all that people value. There are significant externalities involved in disputes over environmental quality, externalities that can be spatial, temporal or value-based. Spatial externalities arise when the actions of the parties involved in a private transaction have physical effects on the interests of persons remote from the site of the transaction. Temporal externalities involve the implications of actions affecting the environment on future generations. Value-based externalities involve the wide variety of interests implicated by non-anthropocentric ethical systems, such as those positing that animals and even ecosystems are entitled to respect in their own right. These values deserve a "place at the table" when actions that significantly affect them are taken. The internal structure of the tort system, however, requires only that the interests of the parties before the court be respected, thus leaving it up to the beneficence of the parties to raise the concerns of the unrepresented, assuming the court would permit them to do so. That beneficence will often substitute inadequately for more inclusive structures, such as public ones. Therefore, the structure of the tort system supplies an argument in favor of public mechanisms, not private ones, to deal with environmental issues that implicate many interests.

That being so, the case for supplanting regulation with tort will have to place great weight on arguments of the second type. This type

6. This essay does not take sides in the debate over whether tort ought to be understood in a purely instrumental manner, as trying to achieve an optimal level of deterrence, or in a formal way, as aspiring to implement corrective justice. See Peter Cane, *Rethinking the Relationship Between Tort Law and Environmental Regulation*, 41 WASHBURN L.J. 427 (2002) (presented at the Ahrens Advanced Tort Seminar, Washburn School of Law, Fall 2001) for one perspective that adopts the corrective justice view. It is possible to use tools for purposes for which they were not designed, and so one could at least consider adopting tort as an environmental regulatory system even if one took a corrective justice view of tort, if it happened to turn out that such a system did a better job in controlling environmental hazards than the alternatives. (In Section II, I do argue that as a descriptive matter tort is best understood as a mixed system, containing both deterrence and corrective justice elements.)

of argument asserts that the tort system, whatever its internal features, produces results sufficiently close to what the collective wants so that it possesses a comparative superiority to alternative regulatory systems.

To evaluate such a claim, we need a picture of the results the tort system is likely to produce. One can begin to assess the environmental consequences of large scale reliance on tort by first determining what our tort system is trying to accomplish in general. Once we have grasped the general ends or objectives of the tort system, we can then see what the pursuit of those objectives in the environmental area would produce, first as a theoretical matter and then as the anticipated results of any practical efforts to put those objectives into practice.

In trying to understand the objectives of tort, we are met immediately with a substantial obstacle: The objectives of tort are the subject of a long-running debate that shows no signs of resolving itself any time soon. The debate centers on two competing theories, deterrence and corrective justice, each of which has variations. Deterrence theory, frequently building on the Judge Learned Hand definition of negligence in *United States v. Carroll Towing, Co.*,[7] understands tort law to be aimed at preventing those harms whose costs of precaution are less than the anticipated cost of the harm.[8] Corrective justice theories understand tort as the redress of injury due to the culpable action of the defendant. As a form of rectificatory justice, corrective justice theories support liability even if it could be shown that liability had absolutely no deterrent effect at all.

An outsider to the debate between deterrence and corrective justice would be justified in concluding that this is a contest neither side can win. For one thing, a number of features of tort doctrine are consistent with either theory. Were this not the case, one side would have triumphed long ago. While such doctrines are inconclusive in choosing between deterrence and corrective justice, other doctrines do seem more easily explained by one — and hence more of an embarrassment to the other. Unfortunately, however, these other features do not uniformly favor one side. Pegging damages to actual loss rather than expected loss fits corrective justice theory nicely, but

7. 159 F.2d 169 (2d Cir. 1947). Under *Carroll Towing*, an action is unreasonable if the costs of injury discounted by the probability of injury occurring exceed the costs of prevention. United States v. Carroll Towing, 159 F.2d 169 (2d Cir. 1947). *See also* Richard A. Posner, *A Theory of Negligence*, 1 J. LEGAL STUD. 29, 32 (1972) (explicating in deterrence theory of negligence and citing *Carroll Towing* as "adumbrating . . . an economic meaning of negligence.").

8. In principle, either a negligence standard or a strict liability standard can be employed to achieve efficient levels of deterrence, depending on the circumstances.

makes less sense from a deterrence perspective.[9] Holding liable persons who caused a harm likewise comports with corrective justice, whereas deterrence theory wants to impose liability on the best risk avoider, who may be someone else entirely.[10] On the other hand, corrective justice theory has real difficulties justifying the vicarious liability of an employer for torts of an employee, whereas this doctrine has a straightforward deterrence rationale.[11]

Looking to what judges write when they author significant tort opinions proves no more helpful in resolving the dispute between deterrence and corrective justice. Judicial decisions seldom if ever reveal what the judge understands the objectives of tort law to be. In *Sindell v. Abbott Laboratories*,[12] for example, the California Supreme Court applied a novel "market share" theory of liability to the 200 or so manufacturers of diethylstilbesterol (DES), holding each of them liable for a share of plaintiff's injuries proportionate to their market share of the product during the period of exposure.[13] Holding the manufacturers liable in the circumstances of *Sindell* constituted a significant innovation in California tort doctrine at the time. One might have thought that the court would justify such an innovation by explaining how market share liability furthers the fundamental purposes of tort, thereby revealing what it took those fundamental purposes to be. The opinion does nothing of the sort. In fashioning its approach, the court's only succinct statement of an end or objective of tort law is the principle that "as between an innocent plaintiff and negligent defendants, the latter should bear the cost of the injury,"[14] a principle that could have its roots in either deterrence or corrective justice.

Sindell is by no means unusual. Judicial decisions in tort frequently rest upon such intermediate principles, ones that are consistent with both deterrence and corrective justice. They rely, in other words, on incompletely theorized doctrine, and do not reach for higher principles than necessary to decide the case before them.[15]

Gary Schwartz has made a very strong case that the best explanation of tort law may be a mixed theory, combining aspects of deterrence and corrective justice.[16] His tentative suggestion is "that tort

9. Gary T. Schwartz, *Mixed Theories of Tort Law: Affirming Both Deterrence and Corrective Justice*, 75 TEX. L. REV. 1801, 1815-16 (1997) [hereinafter *Mixed Theories*].

10. *Id.* at 1816.

11. Gary T. Schwartz, *The Hidden and Fundamental Issue of Vicarious Liability*, 69 S. CAL. L. REV. 1739, 1754. (1996).

12. 607 P.2d 924 (Cal. 1980).

13. Sindell v. Abbott Labs. 607 P.2d 924 (Cal. 1980).

14. *Id.* at 610-11.

15. Cass R. Sunstein, *Incompletely Theorized Agreements*, 108 HARV. L. REV. 1733 (1995).

16. *Mixed Theories*, *supra* note 9, at 1801 ("I . . . show how the combination of deterrence and justice can provide a better or fuller explanation for [a number of tort] doctrines than can either theory standing on its own.").

law imposes or assigns liability for proper deterrence reasons – unless this result is not compatible with the criterion of corrective justice."[17] The peace-agreement efforts of Professor Schwartz notwithstanding, the debate between corrective justice and deterrence shows every sign of continuing, and judicial opinions show no sign of fully revealing a deep explanatory rationale for tort law. So for the foreseeable future, those wishing to consider replacing regulation with tort will be impaired by uncertainty over the ends or objectives of the tort regime.

Suppose, however, that for the sake of argument one were to adopt the deterrence theory as the best rationale for tort law, and hence the best assumption on which to base a prediction concerning the likely consequences of a tort regime for environmental quality disputes. Many advocates of replacing regulation with tort favor just such a deterrence approach to tort. So adopting an assumption friendly to their point of view is a way to put the case for tort in the best light.

The goal of much modern environmental regulation is to prevent harm to the environment before it occurs, with an implementation structure that includes prior approvals, permits that embody standards to be met, and the monitoring of compliance, all with that goal in mind.[18] Modern environmental regulation announces to risk takers the legally enforceable levels of risk or harm. Unlike tort, environmental regulation does not even contemplate compensation of victims, the remedy that is essential to tort's ex post operation,[19] but its increasing reliance on criminal and civil liability for fines and jail time

17. *Id.* at 1824. The premature death of this wonderful individual and outstanding torts scholar has deprived us of the benefit of Gary's further development of his approach.

18. Not all public regulation is structured to operate ex ante. For instance, the FBI has historically been structured with an emphasis on ex post organization, as an agency skilled in criminal investigations after a crime has occurred or specific evidence of a discrete crime has been obtained. As this country assesses the implications of the tragedies at the World Trade Center and the Pentagon on September 11, 2001, the FBI and other law enforcement and intelligence agencies are being urged to emphasize ex ante regulation more. Terrorism poses a dilemma precisely because terrorists are relatively impervious to an ex post system's sole means of prevention, which is to send a deterrent signal to would-be wrongdoers. *See infra* text accompanying note 23. To restructure successfully to stress ex ante controls more, federal agencies will have to alter the manner in which they collect, retrieve, analyze, and share information, as well as how they conduct surveillance of behavior of individuals for whom traditional probable cause standards have not been satisfied. Changes in each of these areas are currently being debated. *See, e.g.*, Stuart Taylor, *Wiretaps Are an Overblown Threat to Privacy*, 33 NAT'L J. 3053 (Oct. 6, 2001) (suggesting Americans are prepared to be surveilled more in order to prevent a recurrence of 9/11); Neil Munro, *The Intelligence Test*, 33 NAT'L J. 3680 (Dec. 1, 2001) (describing need to restructure information gathering and sharing among intelligence and law enforcement agencies); Elizabeth Frater, *Studying Terrorism's Lessons*, 33 NAT'L J. 3688 (Dec. 1, 2001) (discussing need to process information about past terrorist incidents in order to anticipate new ones); Siobhan Gorman, *Shortchanging Prevention?*, 34 NAT'L J. 391 (Feb. 2, 2002) (suggesting administration's budget priorities fail to emphasize prevention sufficiently and remain too reactive).

19. There are limited exceptions to this. One is found in the liability that the Superfund statute imposes for "recovery costs." These can include items that are essentially compensatory, such as alternative water supplies when pollution from a Superfund site contaminates drinking water. Just as interesting, though, Congress debated including in the original Superfund legislation a provision for recovery of damages for personal injury and rejected it.

for responsible corporate officers and others can get the attention of risk takers better than tort can.[20] Permit requirements translate rules and regulations into risk taker specific terms as they frequently do and administrative agencies exist to provide further guidance.[21] Environmental regulation does not ask risk takers to appraise their own risks, thus reducing the problem of over-optimism.[22] Because the regulation is ex ante, it does not depend on detection of harm caused (which might be years down the road), but instead depends on detection of present violations. While such detection also can be difficult, it will be less so than the detection tort requires. In sum, the compliance signal regulation sends to risk takers faces much less interference or static than does tort's deterrence signal, as the following discussion elucidates.

The deterrence theory of tort states its objective as the prevention of harm, just like environmental regulation. Unlike regulation, though, tort has an operational structure designed to function ex post, after harm has occurred. Its objective of preventing acts from occurring that can be judged to be inefficient or unreasonable[23] is one that it must accomplish through implementation and enforcement structures that operate after the fact. For such a system to deter, it must be able to send a signal to parties regarding their future behavior, but to send that signal it must have a case of prior harm to decide.

There are some limited exceptions to tort's ex post operation, but they do not significantly change the ex post nature of that regime. Equity courts did and courts still do recognize a cause of action for anticipatory nuisance, brought prior to harm occurring.[24] Plaintiffs have most frequently sought to bring this type of action, though, in efforts to enjoin conflicting land uses prior to the landowner commencing with the land use, where the extent of the harm that the land use would eventually cause is highly predictable. Where harm is more speculative, even though it might be more likely than not, courts are reluctant to intervene before the fact. The requirement that harm

20. For discussion of the problems tort law has in providing adequate incentives for risk takers to prevent environmental damage, see *infra* text accompanying notes 27-32.

21. Of course, many environmental regulations remain extremely complicated and difficult to interpret. *See, e.g.*, General Elec. v. EPA, 53 F.3d 1324 (D.C. Cir. 1995) (holding that although it was a valid interpretation of its own regulation, EPA's interpretation of a PCB disposal regulation was so obscure that it would violate due process to sanction General Electric for noncompliance with it). Even as to these, however, the existence of an administering agency with whom to consult assists firms in ways that tort regimes cannot replicate.

22. *See infra* text accompanying note 29.

23. This is so even if the standard of liability is strict. If actors are economically rational and aware of the liability regime, strict liability should result in actors not performing actions when the economic gain or other benefits of the action are less than the damages the defendant is expected to suffer. Those actions whose benefits are less than their costs are also the same actions that would be adjudged negligent under the *Carroll Towing* formulation.

24. Enjoining specific harmful acts is often referred to as specific deterrence; deterring types of harmful acts through the motivation to avoid liability is often called general deterrence.

must be imminent and practically certain before an injunction will lie substantially impairs the usefulness of the anticipatory injunction.[25]

The limited circumstances in which injunctions will lie fail to cover many types of cases in which people today worry about environmental risks. Consequently, for many environmental risks the ability of tort to prevent harm will depend entirely on the success of its deterrent effect, which must inevitably be an indirect effect of the signal or message that the tort system sends. It is not enough that tort cases send a message, either. That message must be heard, understood and acted upon before deterrence succeeds. These downstream components to the mechanism of deterrence depend upon individuals, incentive structures and institutions that tort cannot affect directly.

Considerable disagreement surrounds the issue of whether tort law deters. Advocates of deterrence theories with a law-and-economics emphasis are often fairly blithe in asserting that it does. The empirical evidence regarding the deterrent impact of tort law, however, is in some respects quite inconclusive, as Peter Cane has written in his contribution to the Ahrens Seminar.[26]

Several findings from the empirical research on deterrence are more conclusive than others. Many studies of the deterrent effect of liability rules focus on whether or not plant managers, doctors, landowners and others are aware of liability rules and make changes to their behavior in response to the prospect of liability. Evidence confirms that they often do make changes. When Gary Schwartz looked at the question of whether or not tort law really deters by examining available studies in a number of areas, including workers' injuries, medical malpractice, motorist liability, products liability and others, he concluded that "tort law provides something significant by way of deterrence."[27]

There is however, more to be said. Predicting the consequences of tort's deterrence signal — and hence its impact on environmental quality at the point in time that the public desires, before harm occurs — requires more precision than is provided by the blunt conclusion that people react ex ante to the prospect of liability. The question is do they react in a predictable and satisfactory way. The deterrence

25. *See, e.g.*, Rackleff v. Texaco Trading & Transp., Inc., 611 So. 2d 95 (Fla. Dist. Ct. App. 1992) (anticipatory nuisance is available only in limited circumstances to enjoin prospective harm that will necessarily result in the creation of a nuisance). Injunctive relief will also lie in cases of continuing tort, but these are cases in which harm has occurred and is ongoing or recurrent, so they fit the ex post model.

26. Peter Cane, *Rethinking the Relationship Between Tort Law and Environmental Regulation*, 41 WASHBURN L.J. 427, 447 (2002) (presented at the Ahrens Advanced Tort Seminar, Washburn School of Law, Fall 2001) (citing D. DEWEES ET AL., EXPLORING THE DOMAIN OF ACCIDENT LAW: TAKING THE FACTS SERIOUSLY (1996)).

27. Gary T. Schwartz, *Reality in the Economic Analysis of Law: Does Tort Law Really Deter?*, 42 UCLA L. REV. 377, 443-44 (1994).

theory of tort aspires to eliminate only undesirable behavior, defined against a standard of efficiency or unreasonableness, and it predicts that this level of deterrence will be what is observed.

On whether or not this prediction is borne out in practice, the empirical evidence is also fairly compelling, and it is negative evidence. When it comes to achieving the level of risk reduction predicted by the deterrence models, tort law is "not as effective as economic models suggest."[28]

A number of features of the larger institutional ecology within which the tort deterrence signal must be sent and acted upon help explain why risk-creators do not respond to the prospect of tort liability by eliminating all of their undesirable behavior.

- Risk takers tend to be more optimistic about the success of their enterprises than warranted. They systematically underestimate the harm-causing features of their businesses, resulting in taking fewer precautions than disinterested appraisal of the risks would suggest.[29]
- Chances of detection can be small. Because the signal sent by the prospect of liability will be discounted by the probability of being held liable, this produces under deterrence.[30]
- Managers of corporations can have shorter time horizons (discount the future more heavily) than required to motivate proper evaluation of future environmental harms, because they will not be with the corporation indefinitely, or because they prefer short-term profitability in order to ward off takeovers due to shareholder dissatisfaction. For long-latency risks, this can lead to under deterrence.
- The causal effects of a risk can be masked by background causes of the harm. This adds to the detection problem and also leads risk takers to think they might avoid liability altogether.
- Harm can be diffuse and relatively small per victim, creating the possibility that transactions costs and free rider problems will make litigation difficult, so that risk takers would discount the chance of a lawsuit actually being brought.
- The limited liability protections of the corporate form cap the amount of liability to which corporations can actually be exposed. This also caps the strength of the deterrence signal received by risk takers. "Bet the company" gambles will be insufficiently deterred if the net worth of the company is less than the expected harm to the environment.

These imperfections in the transmission mechanisms that deterrence signals must necessarily use suggest reasons why those signals will not have their desired effect. The imperfections, furthermore, are particu-

28. *Id.*

29. James M. Buchanan & Roger L. Faith, *Entrepreneurship and the Internalization of Externalities*, 24 J.L. & ECON. 95 (1981).

30. This problem affects public enforcement of regulations, too. Unlike tort, however, the level of public enforcement is itself a collective decision that remains within the ability of public authorities to correct.

larly noticeable in cases of environmental risks, to such an extent that Troyen Brennan, himself an advocate of increased environmental tort litigation, concludes that the "[e]mpirical evidence suggests that environmental torts suits currently send a weak deterrent signal."[31] Compound these real imperfections with the highly imperfect understanding of them by judges and juries, and the idea that the size of the signal could be modulated to compensate, so as to achieve the correct level of deterrence, becomes rather implausible.[32]

In contrast to tort's ex post structure, the preventive, ex ante orientation toward environmental quality levels is a fundamental attribute of the modern environmental regulatory regime. The basic architecture of that regime came into being in a remarkably short period of time, between 1969 to 1976, when a broad environmental movement helped sweep our core environmental statutes onto the pages of the United States Code. Looking back on the history of that movement, we can locate reasons for why these laws have the ex ante orientation that they do.

Prior to the explosion of legislation around the time of the first Earth Day, American social and political expectations had begun to change, and it was change in the direction of insisting on the prevention of exposure to harm or the potential to harm through our common environment.[33]

> While one could easily focus on the crisis aspect of pollution problems (and this usually was the tone of media coverage), on a more fundamental level the notion of pollution as a problem arose far more from new attitudes that valued both smoothly functioning ecosystems and higher levels of human health . . . .
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> While preventive medicine had made impressive accomplishments in vaccination against infectious diseases, it now seemed to be less interested in the limitations on optimum health that might come from environmental causes . . . . Hence, a major aspect of the public's concern for chemical pollution was either to take matters into their own hands and avoid contaminants by means of new personal lifestyles, or to demand public action to prevent exposure.[34]

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31. Troyen A. Brennan, *Environmental Torts*, 46 VAND. L. REV. 1, 6 (1993).

32. While acknowledging that judges and juries do not actually set out to calibrate damages to correct for errors in transmission, Keith Hylton claims that the availability of punitive damages in addition to compensatory damages means that, at least in low probability of detection cases, "there is a fair chance that the damage levels set for these cases come close to the amount required to provide the appropriate level of deterrence." Keith Hylton, *When Should We Prefer Tort Law to Environmental Regulation?* 41 WASHBURN L.J. 515, 520, (2002) (presented at the Ahrens Advanced Tort Seminar, Washburn School of Law, Fall 2001). With all respect, I am not aware of any empirical support for propositions such as this, the available empirical studies of deterrence do not support it, and there is no theoretical reason to suppose it to be correct.

33. For more on the political environment surrounding the first Earth Day, see MARY GRAHAM, THE MORNING AFTER EARTH DAY: PRACTICAL ENVIRONMENTAL POLITICS (1999).

34. Samuel Hays, *Three Decades of Environmental Politics*, *in* GOVERNMENT AND ENVIRONMENTAL POLITICS 20, 25, 35 (Michael J. Lacey ed., 1989).

The preventive, or precautionary, nature of the early environmental legislation is one of that legislation's central organizing principles, and one that squarely clashes with common law tort. These clashing perspectives were fully ventilated, and their contrasting implications examined, in the landmark case of *Ethyl Corp. v. EPA*.[35] In *Ethyl*, Judge Skelly Wright championed an ex ante precautionary interpretation of a Clean Air Act provision authorizing the EPA to regulate additives to gasoline and diesel fuel, and Judge Malcolm Wilkey ably represented the ex post tort law opposition.

A preventive interpretation prevailed in *Ethyl Corp.*, by the narrowest of margins – five to four before the circuit court sitting en banc. Insofar as it was reading the mood of the country, Judge Wright's interpretation was certainly correct: a politically powerful movement wanted the federal government to act so as to prevent further harm from being inflicted on American citizens. The environment had become a salient force in American politics, and the public arena was responding to it. There are many reasons why Congress and the President responded in the manner in which they did, including building on past strategies, a desire to make a bold statement, a habitual inclination to think in terms of regulatory controls and the preference of some industry for federal regulation preempting state authority. Any such list would be seriously incomplete, however, without adding the straightforward structural similarity between what the public wanted and what the legislation promised directly to achieve — the prevention of unacceptable environmental risks. Ernest Weinrib has suggested an understanding of corrective justice in which tort law replicates and thereby "discloses the form of a transaction as the immediate interaction of two parties"[36] so as to express "the morality of interaction."[37] Similarly, one can say that the logic of environmental regulation in these early statutes discloses the desire of citizens to avoid interactions with the environment that expose them to further risks, so as to express a morality of prevention.

The demand for public action to prevent exposure has remained remarkably constant over the years, suffering none of the low points anticipated by Anthony Downs' theory of the public's short attention span for public issues. Concomitantly, the structure of environmental regulation has remained consistently preventive and ex ante. To replace the enforcement of environmental regulation with tort law would require convincing people that the preventive, precautionary results that we want can actually be better achieved through a system

35. 541 F.2d 1 (D.C. Cir. 1976). *See infra* text accompanying note 40.

36. Ernest Weinrib, *Legal Formalism: On the Immanent Rationality of Law*, 97 YALE L.J. 950, 981 (1988).

37. Ernest Weinrib, *Causation and Wrongdoing*, 63 CHI.-KENT L. REV. 407, 448 (1983).

that concerns itself with prevention only by using litigation to signal future risk takers. As we have already discussed, though, tort's deterrence message will in many cases only be faintly heard and imperfectly obeyed.

In sum, shifting from regulation to tort necessitates convincing the public to make a choice to relinquish the authority to choose levels of environmental quality through collective decision making mechanisms, exactly reversing one of the main ambitions of the environmental movement since its inception. Doing so would at the very least require a conviction that tort's mechanisms of deterrence could approximate the levels of environmental quality desired by the public. Instead, there are substantial reasons to believe that such satisfactory outcomes will not result from tort's weak deterrence signal as applied to environmental risks, even if the public could be convinced to abandon its preference for ex ante structures of environmental quality protection.

Besides the weaknesses in the claim that tort can provide the environmental results that the public desires, there is a significant point to be made about the structure of governance involved in the choice between private and public determination of levels of environmental quality. Public choices are in an important sense prior to private ones. By establishing the conditions and constraints within which private autonomy can be exercised, collective choices significantly shape the decision making environment within which private choices are made. Public choices, for example, can be made with a view to securing the sound functioning of markets through laws that protect private property, enforce contracts, impose liability for fraud and provide for recovery for losses. Such laws enable private choices to be made and markets to operate more efficiently.

Other public choices can restrict certain kinds of transactions, effectively imposing constraints on what can be traded in markets. Examples of such rules are those preventing discrimination on the basis of race, gender, religion or national origin, rules requiring employers to make reasonable accommodations for persons with disabilities and rules prohibiting child labor. These sorts of constraints have a long established pedigree. To a considerable degree, modern environmental legislation reflects the conviction that significant choices about environmental quality ought to operate as constraints on what can be traded in private markets, or resolved through private tort litigation, rather than choices that should be left entirely to those private transactions themselves. As Pete Andrews has expressed the point with respect to environmental and health related legislation:

> President Lincoln did not sign the Emancipation Proclamation on the basis of its economic efficiency . . . nor does society condone murder, theft, perjury, or many other forms of behavior even if their overall economic benefits exceed their costs. These forms of behavior are simply prohibited as unacceptable. Similarly, U.S. health legislation often has been based on the philosophy of protecting citizens as fully as possible from involuntary health hazards, within the constraints of what is technically feasible.
> In this conceptual framework, government is not simply a corrective instrument on the margins of economic markets but an equally central arena in which the members of society choose and legitimize – however imperfectly in practice – their collective value . . . . Such actions may or may not be directed toward economic efficiency.[38]

To see just how deep the differences between tort and environmental regulation run, put aside for the moment all misgivings about whether tort will actually deter, and assume that tort would in fact produce the levels of risk-taking behavior regarding environmental harms that deterrence theory predicts. What will be the resulting level of environmental protection? In the law-and-economics version of deterrence theory, risk takers' will refrain from actions whose expected harms or risks were more costly than the risk takers' costs of prevention. This follows under the efficiency standard of *Carroll Towing* for negligence, where cost-beneficial action would be non-negligent. It also follows under the strict liability standard, where risk takers would be held liable for harms caused, so that they would realize actions that could be prevented for less than the value of such harm would not be worth taking. Under either standard, actions that do not pass a cost-benefit test will be deterred, while actions that do pass a cost-benefit test will not be.[39]

Now, even assuming that tort operated in exactly the way that an idealized law-and-economics analysis portrays, a tort regime would still produce enormously different results from the levels of environmental quality the current regulatory regime seeks to achieve. Environmental legislation regularly establishes standards different from those chosen by cost-benefit considerations, standards aimed at protecting public health as much as possible within the limits of technical and economic feasibility.

Ethyl Corp. v. EPA illustrates how different these standards are. In that contest over the EPA's decision to phase down the lead con-

38. Richard N.L. Andrews, *Cost-Benefit Analysis as Regulatory Reform*, *in* COST-BENEFIT ANALYSIS AND ENVIRONMENTAL REGULATIONS: POLITICS, ETHICS, AND METHODS 107, 112 (Daniel Swartzman et al. eds., 1982).

39. The difference between *Carroll Towing* negligence and strict liability is that under negligence plaintiffs will not be compensated when the action passes Judge Learned Hand's cost-benefit standard, but under strict liability she will be. If risk takers are motivated purely by the economic incentives involved, however, the same actions will be screened out and the same actions permitted under either standard. Assuming perfect deterrence, the choice of negligence versus strict liability has distributional consequences but no environmental consequences.

tent in gasoline, Judge Wilkey's dissent convincingly shows that the EPA lacked the evidence necessary to prevail under common law tort standards in an action against gasoline manufacturers.[40] Proof of the damaging health effects of airborne lead was too inconclusive. For one thing, blood lead levels were the actual objects of public health concern, not the airborne lead levels. Yet the correct way to translate inhaled lead quantities into quantities in the blood was not firmly established. For another, the population was exposed to lead through a variety of sources, and it was difficult to pinpoint the contribution that airborne lead made to blood lead levels. In addition, the levels of blood lead that the EPA was attempting to achieve through its regulation were below those at which studies had convincingly shown adverse health effects. Instead, they reflected the Center for Disease Control's designation of the level of public health concern, the level at which parents were urged to take preventive or precautionary measures to reduce the lead exposure of their children.

A tort law regime would not have sustained the agency action in *Ethyl Corp.* Indeed, it would not matter whether one were pursuing a deterrence or corrective justice theory of tort, because the agency would have failed to establish cause-in-fact, a bedrock requirement of both. Under a tort regime, Ethyl Corporation would have been given no deterrent signal from prior tort cases, nor would it have been specifically deterred in a lawsuit involving it directly.

The EPA proceeded to regulate lead in gasoline anyway, and years later it became possible that a tort standard might have been met. Two factors changed. First, new medical evidence subsequently demonstrated adverse health effects at and below the EPA's target levels for blood lead. Second, the connection between the lead in gasoline and blood lead levels was conclusively demonstrated by a near perfect correlation between declining lead content and epidemiological reports showing declining blood lead levels.[41] It bears note, however, that this latter finding was only made possible by the EPA's preventive action, because it was the ordered phase-down of lead content in gasoline that provided the basis for studying the correlation between it and blood lead levels.

The regulation of criteria air pollutants under the Clean Air Act provides another illustration of the difference between a standard enacted by public choice and a cost-benefit standard. In selecting a

40. Ethyl Corp. v. EPA, 541 F.2d 1, 94-97 (D.C. Cir. 1976) (Wilkey, J., dissenting) (arguing that the statute requires a tort-like showing); *id.* at 100-110 (Wilkey, J., dissenting) (analyzing deficiencies in the evidence).

41. *See* ROBERT V. PERCIVAL ET. AL, ENVIRONMENTAL REGULATION: LAW, SCIENCE AND POLICY 403-04 (3d ed. 2000) (reporting on the NHANES II study of blood lead levels from 1976 to 1980).

health-based standard for the control of the criteria air pollutants, Congress intentionally chose to preclude the consideration of compliance costs, and thus to make it a near certainty that standard-setting for these ubiquitous pollutants would not adhere to cost-benefit principles.[42] If the calculations of industry petitioners are credible, it is very difficult to make a national cost-benefit case for the latest reduction in permissible levels of ozone. It would be quite impossible to make such a case on the more localized level at which tort litigation occurs, where every separate compliance measure could be the subject of litigation, even using the EPA's more favorable economic estimates. Under a tort regime, air quality standards would be different.

Ethyl Corp and the criteria air pollutant standards illustrate the final point of this Section regarding the choice between tort and regulation. The modern regulatory system adopts important elements of a constraint-based view of environmental quality that would be lost if one were to switch to a tort regime.

There are, then, three important and deep points of contrast between tort and regulation. Environmental regulation operates ex ante in an explicit and direct way. Tort operates ex post, and has ex ante effects indirectly and then only in an attenuated form. Environmental regulation makes choices about appropriate levels of environmental quality through public processes, and views those choices as constraints on private action. Tort makes choices about appropriate levels of environmental quality through private, individual decisions, and those decisions tend to treat environmental quality as an ordinary commodity whose level should coincide with a cost-benefit determination.

As a matter of observation, the attributes we have identified as associated with environmental regulation continue to resonate with a substantial segment of the American public. Because these are attributes that a tort regime could not replicate, there is good reason to think that abandoning regulation for tort will not be viewed with favor by that public.

III. Tort Law and Environmental Risks

As the discussion of *Ethyl Corp.* illustrates, tort doctrine will send out no deterrence signal in cases where it finds no liability. This Section refines on this point. There are certain types of environmental harms that are objects of public concern and yet largely evade the tort system because of the doctrinal restrictions of the tort regime. Tort

42. In *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 437 (2001), the Supreme Court upheld the EPA's longstanding interpretation that it was to set standards without regard to compliance costs.

will not be able to address these situations well. On the other hand, there is a paradigm case of harm that tort is relatively well equipped to address. The more the features of an environmental risk resemble the features of the paradigm case of harm or injury tort was originally developed to handle, the better tort is in addressing the environmental risk. Contrariwise, as the features of an environmental risk deviate from the paradigm, the harder it is for tort to address those risks absent wholesale restructuring of tort doctrine.

The paradigm tort case involves a single plaintiff suing a single defendant for a well-documented and significant harm. This is frequently called a bipolar structure, and Ernest Weinrib is correct in asserting that it is the implicit model that the core of tort doctrine assumes.[43] Among those core doctrines of tort is the principle that the plaintiff bears the burden of demonstrating by a preponderance of the evidence that the defendant was the cause-in-fact of her harm. Of course, civil litigation forms in general, and tort in particular, are themselves flexible instruments, and it is totally familiar that tort suits can involve numerous plaintiffs and defendants. Tort acquires this flexibility by augmenting basic doctrine with supplemental provisions to deal with the complications involved, including doctrines distinguishing several from joint and several liability, doctrines of contribution and apportionment, rules regulating joinder of plaintiffs, procedures and standards for creating and maintaining class actions and the like.

In developing the supplemental doctrines necessary to move beyond the bipolar case, so as to deal with harms as they actually arise in the world around us, one fundamental feature of tort has remained constant. Tort innovations have scarcely changed the cause-in-fact requirement. When the harm context implicates a number of defendants, the plaintiff is always faced with the burden of showing that the cause-in-fact of her harm came from within the totality of the defendants' actions, and almost always cannot recover any amount from a defendant unless she can demonstrate that an action of that specific defendant at least contributed to her harm.[44] In part to relieve some of the pressure modern cases put on the cause-in-fact requirement, tort has innovated within damages doctrine, recognizing a right of recovery for costs such as medical monitoring or cancerphobia. These techniques provide some measure of relief for plaintiffs who have

43. I have questioned the justification for adopting the bipolar structure as the centerpiece of tort, but not the fact that it is the structure that tort adopts. *See* Christopher H. Schroeder, *Causation, Compensation and Moral Responsibility*, *in* PHILOSOPHICAL FOUNDATIONS OF TORT LAW 347 (David. G. Owen ed., 1995).

44. Exceptions such as the market-share liability rule of *Sindell* are few and far between; their rarity reinforces the claim in the text. *See supra* text accompanying notes 12-13.

been exposed to potential harm by the otherwise actionable conduct of the defendant by finding a way to characterize a harmful effect that the defendant has caused.

One classification scheme with which to characterize environmental risks can be generated by distinguishing between those that involve single versus numerous parties. On the defendant's side, the source of the plaintiff's harm can emanate from numerous sources — increased lead levels from auto pollution is an example. On the plaintiff's side, the harm that defendants cause can be spread over a wider and wider geographical area, potentially implicating more and more people. Acid rain or global warming are good examples. We can visualize the possible plaintiff-defendant arrangements with the help of Table 1.[45]

		EFFECTS	
		Concentrated	Diffuse
ORIGINS	Concentrated	trespass; "old" nuisances; "signature" toxic harm	tall stack air pollution; non-signature toxic emissions
	Diffuse	contaminated groundwater; Superfund site	criteria air pollutants; non-signature toxic emissions

Table 1

The origins (defendants) and the effects (plaintiffs) of environmental harm actually vary along a continuum, but the Table marks out the ideal types, and this serves a useful illustrative purpose.

First, note that the bipolar paradigm, in the upper left hand box, fits some modern environmental risks as well as older types of tort situations. A particular toxic emission can come from a concentrated[46] set of sources *and* the toxic substance can be the predominant source of a particular type of harm, as for instance asbestos is with respect to mesothelioma. Here we have a "signature" tort.[47] In such a case, there will often be a straight causal link from a downstream case of mesothelioma back to one or a few sources. Long latency periods confound problems of proof, to be sure, but the case fits the idealized bipolar model fairly well.

Cases in the upper right, those with diffuse effects from concentrated origins, face some doctrinal difficulties in tort. The fundamen-

45. A similar 2x2 diagram is used by Troyen Brennan to make related observations. *See* Brennan, *supra* note 31, at 13.

46. Understand "concentrated" here to be satisfied if the discrete sources are few in number, even if geographically dispersed.

47. *See* Brennan, *supra* note 31.

tal one arises in situations where harm falls broadly on a large group and any individual harm does not rise above a threshold necessary to constitute an actionable injury. In that case, the sources of the harm may be causing harm that in the aggregate justifies intervention, but no one will be able to litigate. Even if this doctrinal threshold is passed, plaintiffs with small injuries face daunting and unattractive transaction costs of litigation. While class action devices can ameliorate some of the transaction costs problem, cases of only moderate individual injury remain difficult to bring.

Lower left cases, concentrated effects from diffuse origins, present different doctrinal problems, especially ones having to do with the cause-in-fact requirement. Joint and several liability can provide plaintiffs with one way around an individualized cause-in-fact showing; this has the practical effect of shifting the burden onto the defendants to figure out a way to apportion the plaintiff's loss among themselves, or for individual defendants to disprove a causal connection between their acts and the plaintiff's harm. The range of cases to which joint and several liability applies is under continual pressure from defendants claiming it to be unfair.

Cases in the lower right, diffuse effects from diffuse origins, pose the greatest challenges for tort. Ozone, for example, is produced from precursors that themselves originate from numerous sources, including stationary and mobile sources, both local and remote. Plaintiffs having asthma attacks face insurmountable difficulties in identifying and bringing into court enough defendants sufficient even to capture a bare majority of the human origins of causes of asthma attacks, let alone the entire group of responsible sources. Sustaining the burden of showing that plaintiff's harm resulted from the actions of the defendants will thus prove quite difficult. Compounding the problem of absent defendants is the fact that asthma attacks can be caused by factors other than manmade elevated ozone. The manmade causes of asthma attacks may actually be a small enough fraction of total expected asthma attacks that the plaintiff could not prevail on cause-in-fact even if she had 100 percent of the human origins of ozone present as defendants.

Background rates of injury can make toxic cases instances of diffuse effects as well. Seeing how requires a little elaboration, because from the ex post perspective of tort, a suit for injury of the type expected from toxic exposure would wait until harm had occurred. At that point, the case would look like a case of concentrated effects, and hence one that tort might at least in some halting way handle. The difficulty is that in a case in which the effects caused by the manmade risks remain hidden within a slightly elevated background rate, we

cannot tell whether a given case of harm originates in something done by the defendant(s) or in some other causes, including natural ones.[48] Because the tort is non-signature, we cannot trace any harm back to any specific human origin, so the effects of defendants' risky behavior will remain spread out among the entire exposed population as risk exposure, rather than as identifiable concentrated harm. When the contribution of the defendant to the total expected incidence of harm is significant but small, it will be possible to say that the defendant more likely than not caused *some* harm, but impossible to say *which* harm. This concatenation of elements has led some commentators to urge a cause of action for having exposed people to risk. So far, however, the common law tort system has remained quite resistant to such an innovations.

Cases in this final category of environmental risks, then, are likely to remain impervious to the doctrines of tort. Yet such risks — diffuse effects from diffuse origins — are among some of the most important objects of regulatory attention today. In cases such as these, shifting from regulation to tort would be tantamount to abandoning efforts to reduce the prevalence or magnitude of such risks.

IV. Another Common Law Regime As An Alternative to Regulation[49]

For the foreseeable future, another common law regime promises to do more to replace traditional environmental regulations than the tort regime does. This is the private property regime. A recurring criticism of public regulation as it has been practiced in the United States to date is that it is clumsy and inflexible, failing to achieve desired ends because it fails to take advantage of local knowledge and expertise, and achieving what it does at too great a cost. Tort law would be responsive to those concerns, but unfortunately it would purchase gains in flexibility and efficiency by jettisoning both the preventive character of regulation and the public setting of environmental quality goals, two hallmarks of public regulation, as well as achieving a level of environmental quality different from what we desire.

Market-based or incentive-based regulatory instruments can often combine the desirable features of public regulation's public and preventive character and tort's flexibility. Such regulatory instru-

48. This is the problem of the indeterminate plaintiff. *See* Kenneth S. Abraham, *The Relation Between Civil Liability and Environmental Regulation: An Analytical Overview*, 41 Washburn L.J. 379, 382 (2002) (presented at the Ahrens Advanced Tort Seminar, Washburn School of Law, Fall 2001).

49. This section draws on Christopher H. Schroeder, *Third Way Environmentalism*, 48 U. Kan. L. Rev. 801, 813-17 (2000).

ments constitute serious efforts to employ what Charles Schultze has called "the public use of private interest," without at the same time endorsing the individualistic and deregulatory proposition that private economic decisions are always superior to public ones. In contrast with command-and-control, they provide considerable individual freedom to act as individuals think best, but within constraints of environmental quality levels that have been established publicly. Individuals can utilize their own creativity in acting to maximize their own self-interest by finding least cost actions in situations where those actions also are consistent with accomplishing a publicly determined environmental objective.

The acid rain abatement program of the 1990 Amendments to the Clean Air Act provides an exemplary case study of such incentive-based approaches. In Title IV of the Clean Air Act, Congress established a program to reduce total emissions of sulphur dioxide by about ten million tons per year, to approximately fifty percent of 1980 levels. The program does not instruct any specific firm as to how much it must reduce individual emissions, or even whether it must reduce them at all. Instead, Title IV creates a system of marketable permits, or allowances, and mandates that once the program is initiated that it is unlawful to emit sulphur dioxide in excess of the number of allowances owned.[50] Finally, by statute the program establishes the quantity of allowances necessary to permit the mandated levels to be met, but not exceeded, and it also makes the initial allocation of those allowances. Coal fired powerplants in the Midwest received the bulk of the allowances, based on a percentage of their historic emission levels. Other allowances were retained by the EPA to be sold at public auction, and still others were made available as incentives to facilities that undertook especially beneficial reduction programs.

The acid rain program creates a private property regime for the control of acid rain precursors. It retains a preventive structure and the public selection of environmental goals, while eliminating much of the normal regulatory superstructure and giving firms the flexibility to choose the least costly strategy available to them, given the constraint that they must own allowances to match their emissions. A utility facing steep costs of pollution abatement can go into the marketplace and purchase additional allowances, while one facing favorable costs can reduce emissions below the level of currently owned allowances and then sell the excess. Utilities can also reallocate allowances among their own powerplants according to the same least cost principle. It has been estimated that the cost savings achieved by this ap-

50. A single allowance authorizes the emission of one ton per year of sulphur dioxide. 42 U.S.C. § 7651a(3) (1995).

proach compared to the traditional command-and-control approach amount to several billion dollars per year.[51]

Cap-and-trade[52] techniques such as the acid rain program create property regimes that ought to be used more in situations where the environmental problem comes from many sources and has widely dispersed effects, such as is the case with acid rain itself. Interestingly, this is just the category of environmental problems which tort law is poorly equipped to address.

Strong environmentalists have historically opposed market creation devices for two principal reasons. First, by enabling polluting firms to acquire a "license to pollute," they sanction the amount of pollution that the firm continues to emit.[53] Second, environmentalists have been skeptical of the efficacy of such devices, fearing that firms will find ways to avoid actual pollution reductions.[54] While zealous environmentalists will remain skeptical of such devices on these grounds, these objections are diminishing in significance among the rest of the environmental community. The license to pollute objection rests on a view of the objectives of environmental quality that sees any amount of potentially harmful pollution to be contrary to the public's choice. It is becoming apparent, however, the public is not committed to such an absolutist goal.[55] This does not mean that it wishes the

51. Prior to enactment, it had been estimated that allowances would trade for approximately $1,000 each. In the EPA's first auction, an allowance for a ton of sulphur oxides sold for around $300. In subsequent years, the March auction price has remained below $200. Prices were anticipated to rise as the program moved into Phase 2 in 2000, as this phase ratcheted down the overall cap. *See* PERCIVAL ET AL., *supra* note 41, at 594-96. But so far Phase 2 has not seen a dramatic price increase. Not all of the cost savings can be attributed to the market efficiently allocating allowances. A good portion of it is due to deregulation of the railroad industry, which resulted in lowering the transportation costs of low-sulphur Western coal, enabling some utilities to lower emissions by switching fuels. *See* Robert W. Hahn, *The Impact of Economics on Environmental Policy* 6 (AEI-Brookings Joint Center for Regulatory Studies, Working Paper No. 99-4, 1999) (citing Richard Schmalensee et al., *An Interim Evaluation of Sulfur Dioxide Emissions Trading*, 12 J. ECON. PERSP. 53 (1998)) (on file with author); Robert Stavins, *What Can We Learn From the Grand Policy Experiment: Positive and Normative Lessons From the SO2 Allowance Trading*, 12 J. ECON. PERSP. 69 (1998) (noting railroad deregulation, utilities' decision to scrub rather than purchase emissions, and the addition of 3.5 million extra bonus allowances toward the end of congressional deliberations all contributed to smaller savings than anticipated). Still, the flexibility of the Title IV program has enabled utilities to make significant cost-saving choices. *E.g.*, Robert W. Hahn, *The Impact of Economics on Environmental Policy* 10 (AEI-Brookings Joint Center for Regulatory Studies, Working Paper No. 99-4, 1999) (citing Dallas Burtraw, *Cost Savings Sans Allowances Trades? Evaluating the SO2 Emissions Trading Program to Date* (Resources for the Future, Discussion Paper 95-30-REV, 1996) ("primary source of cost savings was not directly from trading across utilities, but rather from the flexibility in choosing abatement strategies within utilities.")) (on file with author).

52. So-called because the program first puts a cap on total overall emissions and then permits emitters to trade rights to pollute among themselves in order to achieve lower cost solutions.

53. Michael J. Sandel, Editorial, *It's Immoral to Buy the Right to Pollute*, N.Y. TIMES, Dec. 15, 1997, at A23.

54. *See, e.g.*, RICHARD A. LIROFF, REFORMING AIR POLLUTION REGULATION: THE TOIL AND TROUBLE OF EPA'S BUBBLE 11 (1986) ("Unless the rules governing trading are fairly strict, they will only enable industries to 'game' regulators.")

55. *E.g.*, DANIEL A. FARBER, ECO-PRAGMATISM: MAKING SENSIBLE ENVIRONMENTAL DECISIONS IN AN UNCERTAIN WORLD (1999).

choice of environmental goals to be abandoned to the market and to tort litigation, however. Rather, much as the right to free speech is strongly valued but at the same time understood not to condone shouting "fire" in a crowded theater, the public is currently struggling to articulate the limitations on its strong preference for environmental quality. As for the possibility that tradeable permits will not work, there are indeed pitfalls to be avoided in the structuring of such markets and there are situations in which they will not work well. Still, the success of the acid rain program, as well as other instances, has helped establish the efficacy of market creation devices in situations where they are appropriate and well designed.

As confidence increases that market or incentive based regimes can be designed so that desired levels of environmental quality will result, the use of such mechanisms will increase. The use of property regimes in this way can move forward to supplant or supplement traditional environmental regulation in ways that tort regimes cannot because property regimes can be designed so that the selection of the desired level of environmental quality can continue to be set through public means and because requirements to purchase necessary rights to the environment ex ante can be clearly articulated and understood by regulated parties.[56] The structure of property regimes is thus compatible with the distinctive features of the regulatory system that we have seen separate tort from regulation and which the public continues to prefer.

V. CONCLUSION

This essay has identified three distinctive features of environmental regulation that tort does not share. A regulatory regime sets the desired level of environmental quality through public processes, its structure and mode of operation stress the prevention of harm before it occurs, and the levels of environmental quality our existing regulatory structure targets as its goals differ from the levels that would emerge from a weighing of the competing private costs and benefits through the tort system. These features of environmental regulation remain popular with a significant segment of the American public and are likely to remain durable desiderata for an environmental quality regime. A tort regime would be unable to replace these features of the regulatory regime with any functional equivalents.

56. Whether marketable permit regimes function well ex ante depends upon practical features in the implementation, monitoring and enforcement of them, much as the success of traditional regulatory regimes depends upon these factors. In contrast, the deterrence signal through which tort operates to have ex ante effects faces less tractable obstacles. See discussion of these difficulties, *supra* text following note 37.

Accordingly, replacing environmental regulation with tort would require abandoning these structural features of which the public approves, either because the features are themselves rejected, or because tort offers such advantages in its other qualities that gaining those advantages is worth the sacrifice of those features. So far, neither case has been convincingly made. Furthermore, increased implementation of market or incentive based mechanisms may move the existing regulatory system in the direction of flexibility and cost-effectiveness sufficiently to dilute the case to be made for tort, as it is in these two areas that tort theoretically has the most to offer.