POLLUTION EXTERNALITIES:
SOCIAL COST AND STRICT LIABILITY

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Introduction

This paper critically considers the neoclassical social-cost approach to problems of pollution. This traditional approach, when subjected to close scrutiny, is found to be seriously wanting in applicability and consistency. A less ambitious alternative based on notions of strict liability is offered.

The social-cost approach is an offshoot of the "new welfare economics" developed during the last four decades. In its modern manifestation it entails the use of notions of economic efficiency to determine basic rights, including the right to pollute. This efficiency approach is surveyed in the next section. In the final section I will offer the strict liability alternative as a preferred approach.

The methodological basis of the criticism of social cost comes from a revived and growing tradition in economics known as subjectivism. I contend that most economists would agree that the subjectivist approach is the correct one, but they are unwilling to live with its implications. For that reason the implications are seldom drawn. This inconsistent behavior may be responsible for much ill-conceived policy. It is my purpose in this paper to foster an awareness of these problems in the hope of promoting more careful policy responses.

The Efficiency Approach

Pollution as an Externality

In by far the majority of cases, modern economists writing about

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pollution do so within a theoretical framework that sees pollution as a result of some sort of "market failure." If property rights of ownership and exchange of resources were always well defined, and as a consequence, the exchange process did not generate any "externalities,"[1] market failure could not exist. Thus, if a factory located next to a laundry spews smoke into the air, thereby increasing the laundry's production costs, this is because the "market fails" to charge the factory for its use of the air as a dumping ground. Similarly, if two firms are located on a river, one upstream, one downstream, and the former discharges waste into the river that impacts adversely on the latter, this is only an externality problem if no one owns the river and can regulate and charge for its use.

In the absence of market failure in a fully competitive, stationary economy (one devoid of monopoly elements and distorting taxes), relative prices will reflect accurately the (private) costs as seen by the individual economic agents. Such a situation will be a Pareto optimum, that is, a situation characterized by the property that any change will make at least one agent worse off. In the presence of externalities the marginal costs as seen by the private agents — marginal private cost — may diverge from the marginal costs to "society" — marginal social cost. Thus, the polluting factory mentioned above does not reckon as part of its incremental cost of production the cost to "society" of the additional deterioration of the atmosphere that it causes. Its marginal private cost is below the marginal social cost. Such a situation will not be Pareto optimal.

Economists often suggest that a judicious combination of taxes and subsidies (ignoring administration costs) can move the society to a new situation in which both a polluting factory and society are better off; the factory, because it is paid not to pollute (or pollute less), society because it has cleaner air. If so, the new situation is Pareto superior. A potentially Pareto superior position exists if the value of cleaner air to society is greater than the value of lost production to the factory. Thus, a policy to reduce pollution may be a move to a potentially Pareto superior position (sometimes identified as a Kaldor-Hicks move) even if no compensation is actually paid to the factory. Obviously, these concepts apply not just to our factory example, but to all pollution externalities.

Naturally, the question arises: If a potential Pareto improvement exists, why do the affected parties not negotiate a mutually beneficial deal voluntarily? The amount that smoke pollution vic-

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[1] An externality is an effect "external" to the transacting parties.

tims are willing to pay to reduce (eliminate) the pollution is, by definition, sufficient to bribe the factory to go along. The short and obvious answer (to which I will return later) is that the costs of transacting such a deal are prohibitive, particularly if there are a large number of pollution victims or if the negotiating parties engage in strategic behavior.[2] If there are a large number of pollution victims, pollution acquires the characteristics of a public good (or, more accurately, a public "bad"). Public goods are those goods like radio, television, national defense, and widespread pollution from whose benefits or harms it is difficult (impossible) to exclude additional consumers. More intuitively, pollution removal may be something which automatically (i.e., at no extra cost) benefits all the pollution victims so that the familiar "free rider" problem emerges.

From the perspective of this theoretical framework then, pollution is equivalently a problem of a divergence between private and social costs, an inability or reluctance to adequately define and enforce property rights, or a problem of the existence of (sometimes public goods-type) externalities. And the general solution is somehow to "internalize" the externality (for example, by establishing and enforcing new property rights or by tax-subsidy policies to achieve equality between private and social costs, etc.). Such policies will involve potential Pareto improvements. A move involving a potential Pareto improvement is sometimes called an "efficient" move.

Alternative Solutions

The efficiency approach to pollution outlined in the previous section seems to provide, in spite of its formidable terminology of externalities, market failure, Pareto optima, public goods, etc., a coherent and consistent framework for analyzing pollution problems. Its attractiveness lies in its apparent ability to "solve" the pollution problem by identifying the "optimal level" of pollution[3] and adopting the most attractive policy to achieve it. The economics literature, nevertheless, evidences considerable debate as to which policy would best achieve the desired result.

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[2] See, for example, A. Mitchell Polinsky, "Controlling Externalities and Protecting Entitlements: Property Rights, Liability Rule, and Tax-Subsidy Approaches," *Journal of Legal Studies* 8 (January 1979): 1-48, for a rigorous treatment of the questions of strategic behavior in this context.

[3] For a prototype, see Wildred Beckerman, *Pricing for Pollution* (London: The Institute of Economic Affairs, 1975).

It was in his influential *The Economics of Welfare* that Arthur Pigou[4] made popular the notion of a divergence between marginal social cost (MSC) and marginal private cost (MPC). A simple solution to this divergence would appear to be to impose an excise tax on the polluter equal to the divergence MSC-MPC. This would internalize the cost to the polluter whose marginal cost including the tax would be MPC + (MSC – MPC) = MSC. An alternative would be to subsidize the polluter not to pollute. If we ignore the implications of wealth effects and entry into the polluting industry in the long term, this should produce a result identical to that obtained with the excise tax. This is because for every increase in output that the polluter produces, he forgoes a subsidy equal to the increase in the value placed on the damage to the environment that he causes. However, the tax alternative is often preferred for two reasons. First, since it is the polluter who "causes" the damage, equity considerations entail that he should pay. Second, the subsidy alternative will encourage more polluting firms in the long run.[5]

The tax on pollution of the air and water (effluent charges) is seen to have a number of advantages over more direct systems of regulation. A system of direct regulation of pollution would have to choose among controlling the output of the polluting industry, the level of pollution it causes, the pollution avoidance measures it adopts, or the pollution avoidance methods adopted by the victims. As with all systems of direct quantitative controls, the danger of bureaucratic inefficiency looms large. The strong incentive to collect and use information relating to pollution in an efficient way is lacking. By contrast, using a tax preserves many of the features of a spontaneously adjusting price system. It reduces the range of decisions to be made by a pollution administration bureaucracy to the choice of tax rates, methods of collection, disbursement, etc., and it preserves the incentive of the firm to search for innovative, less expensive methods of pollution control.[6]

> Effluent charges always possess a further major attraction; their enforcement mechanism is relatively automatic. Unlike direct controls, they do not suffer from the uncertainties of detection, of the decision to prosecute, or of the outcome of that judicial hearing including the possibility of penalties that are ludicrously lenient.[7]

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[4] A.C. Pigou, *The Economics of Welfare*, 4th ed. (London: Macmillan and Co., 1946).
[5] For example, Beckerman, *Pricing*, pp. 38-39.
[6] See generally Beckerman, *Pricing;* Allen V. Kneese, *Economics and the Environment* (Middlesex: Penguin Books, 1977), chaps. 1 and 5; and Stephen F. Williams, *Pollution Control: Taxes Versus Regulation,* ITER original paper, August 1979.

However, introducing complications into the analysis may cause one to modify the presumption in favor of taxes somewhat. In spite of their well-known disadvantages, direct controls may be preferred on the grounds that *if they can be enforced* (at reasonable cost) "they can induce with little uncertainty, the prescribed alterations in polluting activities."[8] The facts of uncertainty may, furthermore, entail some sort of hybrid program, particularly when some threshold level of pollution damage is to be avoided at all costs.

> Where threshold problems constitute a serious environmental threat and where levels of polluting activities may require substantial alteration on short notice, which is not a rare set of circumstances, a hybrid program using both fees and controls may be preferable to a pure tax subsidy program.[9]

The reference to changing conditions in the above quotation should give us pause. The efficiency framework of analysis, which lies in the background of the discussion of the optimal regulatory policy, is at its best in an unchanging, static environment. As long as the changes we admit into the analysis are easily predictable in a relative frequency sense (like the weather as an influence on pollution effects), we may preserve some of the neat properties of the framework and proceed (as do Oates and Baumol and others) to weigh advantages and disadvantages of alternative regulatory schemes in a fairly definitive way. But when the environment is a radically dynamic one, in the sense that intrinsically unforeseeable changes occur often, we may wonder whether an alternative approach is not called for. I will return to this at some length.

A major challenge from within the efficiency approach to the use of any regulatory device as a solution is provided by the property rights approach to resource usage. It is best to consider this first before attempting a more general critique. Early contributions by Frank Knight and Jacob Viner[10] served to weaken arguments in favor of administrative intervention and to strengthen the presump-

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[7] Wallace E. Oates and William J. Baumol, "The Instruments for Environmental Policy" in Edwin S. Mills, ed., *Economic Analysis of Environmental Problems* (New York: National Bureau of Economic Research, 1975), p. 103. See also the highly readable Edwin G. Dolan, *Tanstaafl* (New York: Holt, Rinehart and Winston, 1969), chaps. 3 and 4.

[8] Oates and Baumol, "The Instruments," p. 106.

[9] Ibid., p. 108. See also E.J. Mishan, "What is the Optimal Level of Pollution?," *Journal of Political Economy* 82 (November 1974): 1287-99.

[10] Frank H. Knight, "Some Fallacies in the Interpretation of Social Cost," *Quarterly Journal of Economics* 38 (August 1924): 582-606; Jacob Viner, "Cost Curves and Supply Curves" in *Readings in Price Theory* (American Economic Association, 1953), pp. 233-42.

tion that unaided market forces could deal effectively with environmental problems.

Too ready a recourse to excise taxes or other controls was to be avoided. The identification of the "optimal" tax was an extremely difficult task, and the presence of monopolistic and other distortions elsewhere in the economy than in the polluting industry may imply perverse general equilibrium results from an optimal policy in the partial equilibrium context (about which more below). If, however, one characterizes pollution problems in terms of inappropriately defined (or enforced) property rights, the need for regulatory policy tends to disappear. Thus, dealing with Pigou's optimal tax solution to the congested highway problem, Knight characterized the problem as one of the overuse of the scarce highway space as a result of its being treated as a common property resource. From this perspective the correct solution was to treat the highway as private property. Its use would then tend to be automatically priced to reflect the marginal cost of congestion.

This major insight was not developed much further until the seminal contribution by Ronald Coase in 1960.[11] With this contribution the property rights approach was found to contain an impressive set of important and provocative policy implications all of which may not yet have been uncovered. Coase's argument starts with a basic proposition that has become popularly known as the Coase theorem. If there are not any (or negligible) wealth effects and there are no costs associated with transacting private environmental contracts, the optimal solution to any externality problem would be independent of the assignment of liability (or property rights) and would be automatically attained in the market place. Thus, in the factory-laundry example it makes no difference (in the absence of wealth effects and transactions costs) whether the right to pollute is awarded to the factory or the right to be free of pollution is awarded to the laundry. Following E.J. Mishan[12] we may designate the former assignment of rights an L law and the latter an $\bar{L}$ law.

Generally, an L law awards the right to the party generating the negative externality and an $\bar{L}$ law awards it to the party harmed by it.[13] Under the L law the laundry will have to pay (bribe) the factory

[11] Ronald H. Coase, "The Problems of Social Cost," *Journal of Law and Economics* 3 (October 1960): 241-62.
[12] E.J. Mishan, *Cost-Benefit Analysis* (London: George Allen and Union, 1971), chaps. 19 and 52; "Pareto Optimality and the Law," *Oxford Economic Papers* 19 (November 1967): 255-87.

not to pollute. It will do so only as long as the incremental gains from pollution reduction outweigh the incremental cost of the bribe. And the factory will accept the incremental bribe only if it outweighs its marginal loss in incurring (the lesser of) a reduction in *production or an increase in pollution removal.* Obviously an equilibrium will involve equality between the marginal benefits and marginal costs of pollution reduction as valued by the parties. At this point the *optimum amount of pollution will be produced.* The position will be efficient in the sense that both parties will have an incentive to adopt the least-cost alternatives. In this way the externality is automatically internalized; the social costs are automatically reflected in the parties' willingness to "pay for" pollution or its absence.

Under an $\bar{L}$ law the factory would have to compensate (bribe) the laundry to accept incremental units of pollution. It would do so only so long as the value to it of increases in pollution outweighed the lesser of the costs of removing the extra pollution or bribing the laundry. The equilibrium will be identical with that under the L law, with the marginal benefit to the factory of the last pollution unit equal to the marginal cost of that unit to the laundry (for which it is justly compensated). The two cases are exactly symmetrical with the equilibrium outputs of the factory's product, the pollution and the laundry's product unaffected by the choice of law. The distribution of wealth between them, however, will be so affected as well as by the bargaining power of the parties. The uniqueness of the solution arises, as I shall have occasion to emphasize, because the exchange values, at the margin, between the outputs of the factory (its product and its pollution) and of the laundry are independent of the liability assignment.

In summary, if, for any marginal change, the cost to the laundry of the pollution damage is less than the cost to the factory of not polluting (where "cost" refers to the least-cost method), the pollution will be tolerated whatever the law. Under an L law the laundry cannot bribe the factory; under an $\bar{L}$ law the factory can bribe the laundry. Similarly, if, at the margin, the cost to the laundry exceeds the cost to the factory, the pollution will be removed; under the L

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[13] A strict interpretation of the Coase theorem requires, as we shall see in a moment, that the notion of "cause" be abandoned once we recognize the reciprocal nature of *these problems. The pollution damage may* thus be seen to be "caused" by the laundry in choosing to locate next to the factory. If so, the L and $\bar{L}$ law definitions lose meaning. However, in most contexts the activity to be regarded as the "nuisance" is very clear and there will be no ambiguity. Where it is not, it simply requires that we specify the content of the L law.

law, because the factory will be bribed; under the $\overline{L}$ law because the laundry cannot be bribed. The results generalize easily to all externality situations. In the absence of wealth effects and transaction costs all changes for which the benefits to the gainers outweigh the costs imposed on the losers will be undertaken; all changes for which the benefits of the gainers fall short of the losses imposed on the losers will not. All changes are thus potential Pareto improvements; all changes are efficient.

From the perspective of the Coase theorem, since resource allocation is unaffected by the assignment of liability, the question of responsibility for the pollution is blurred. Where we observe externalities persisting uncorrected it must be because of the existence of prohibitive transactions cost. Pollution is thus no longer a phenomenon attributable to a particular economic agent. Rather it reflects an inability (or unwillingness, given the costs) of all of the affected parties to negotiate externality away.[14] To the alternatives of simply tolerating the pollution or attempting to regulate it must be added that of attempting to redefine property rights so as to reduce transaction costs. The question of "who causes the pollution?" becomes irrelevant if not meaningless, and an appropriate common law response to questions of this nature then becomes: Award the right to whichever party would have been prepared to buy it in the absence of transactions costs.

It is this implication of the Coase theorem, namely, that the courts should respond to disputes involving externalities by awarding rights to those who value them most (as in accident cases, assign liability to the least-cost avoider) that has spurred the large and growing literature on what has become known as the economic approach to the law.[15] Some of the implications arising out of recent debate over this approach will be considered in the next section.

The Coasian challenge to the established Pigouvian framework was taken up by Baumol, who sought to address the following: Coase argued that powerful market forces exist that tend to bring private and social cost into equality without the use of a tax (subsidy). But where transactions costs are high (as in the case of pollu-

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[14] It is important to note that "[B]y extending the concept of transactions cost to encompass any inertia or lack of initiative in society, one comes uncomfortably close to the thesis that in economics, whatever is, is best." E.J. Mishan, "The Folklore of the Market," *Journal of Economic Issues* IX (December 1975): 699.

[15] See especially Richard A. Posner, *Economic Analysis of the Law*, 2d ed. (Boston: Little, Brown & Co., 1977). A particularly clear short statement is Harold Demsetz, "When Does the Rule of Liability Matter," *Journal of Legal Studies* 1 (January 1972): 13-29.

tion with many victims) some kind of interference is necessary. The Pigou solution is formally equivalent to the zero transaction-cost solution.

> Despite the various criticisms that have been raised against it in the large numbers case, which is of primary importance in reality and to which Pigou's analysis directs itself, his tax-subsidy programs are generally those required for an optimal allocation of resources. Moreover . . . where an externality is (like the usual pollution problem) of the public goods variety, neither compensation to nor taxation of those who are affected by it is compatible with optimal resource allocation. Pigouvian taxes (subsidies) upon the generator of the externality are all that is required.[16]

This proposition seems to have some degree of acceptance, even among property-rights theorists. For example, Demsetz has recently argued that

> when the gains or costs associated with particular interactions are not confined to a few parties, but instead are spread thinly over large numbers of individuals, then "high" transactions costs and "free rider" problems may be serious, even when utilizing the best of private property rights definitions, and some attenuation of private rights may be rationalized to achieve a more efficient solution to resource allocation problems. The traditional examples of providing national defense, national foreign policy, and cleaner air come to mind. . . .
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> High transactions costs and free rider problems sometimes can be resolved by substituting private rights for communal property rights arrangements . . . But this is practical only when the cost of excluding nonpayers is not too high. When dealing with national defense and air pollution problems this does not seem to be the case, and when it is not, a rationalization for action by the state in the name of efficiency becomes available.[17]

Thus, while there may remain some disagreement among efficiency theorists about the policy (or policies) of choice in the face of externalities where small numbers of individuals are affected (although one gains the strong impression that the Coase property-rights approach has strong majority support), when it comes to public goods-type problems this disagreement disappears. The presumption in favor of a (court-encouraged) market solution

[16]William J. Baumol, "On Taxation and the Control of Externalities," *American Economic Review* 62 (June 1972): 307-22. But see Earl A. Thompson and Ronald Bathelder, "On Taxation and the Control of Externalities: Comment," *American Economic Review* 64 (June 1974): 467-71.
[17]Harold Demsetz, "Ethics and Efficiency in Property Rights" in Mario Rizzo, ed., *Time, Uncertainty, and Disequilibrium* (Lexington: Lexington Books, 1979), 97-116.

evaporates. One suspects that it is because public goods-type prob-
lems appear so difficult to deal with on a voluntary basis that we
find even the most popular spokespersons for the market explicitly
sanctioning a government-imposed tax system as apparently the
only alternative to the much inferior regulatory agency approach.[18]
The imposition of taxes (subsidies), it should be noted, is ironically
advocated in the "name of efficiency"[19] and the market. And, in an
ideal world, the ideal tax would strike that balance between "social"
costs and benefits that yielded the "right" amount of pollution.

> The real problem is not "eliminating pollution" but trying to
> establish arrangements that will yield the "right" amount of
> pollution: an amount such that the gain from reducing pollution a
> bit more just balances the sacrifice of the other good things . . .
> that would have to be given up in order to reduce the pollution.[20]

We may call this general approach a *social-cost* approach.

Before concluding I should note that it is widely recognized that
as a practical matter it is impossible to evaluate the optimal tax. In
light of what is to follow it is worth quoting at some length from
Baumol:

> . . . we do not know how to estimate the magnitudes of the social
> costs, the data needed to implement the Pigouvian tax-subsidy
> proposals. For example, a very substantial portion of the cost of
> pollution is psychic; and even if we knew how to evaluate the
> psychic cost to some one individual we seem to have little hope of
> dealing with effects so widely diffused through the popula-
> tion. . . .
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> Unfortunately, convergence toward the desired solution by an
> iterative procedure of this sort requires some sort of measure of
> the improvement (if any) that has been achieved at each step so
> that the next trial step can be adjusted accordingly. But we do not
> know the socially optimal composition of outputs, so we simply
> have no way of judging whether a given change in the social tax
> values will even have moved matters in the right direction. . . .[21]

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[18] Thus, Milton and Rose Friedman write: "Most economists agree that a far better
way to control pollution than the present method of specific regulation and supervi-
sion is to introduce market discipline by imposing effluent charges." *Free to Choose*
(New York: Harcourt Brace Jovanovich, 1979), 217-18.

[19] See Demsetz, "Ethics and Efficiency."

[20] Friedman, *Free*, p. 215. And Mishan (not particularly enamored with any aspects
of the market solution) affirms, citing Baumol and Oates: "Certainly the use of taxes
to enforce tolerable standards may yield significant social gains over and above the
costs of enforcement." "The Folklore," p. 701.

[21] Baumol, "On Taxation," p. 316. The problem is compounded, explains Baumol, by
the fact that where externalities are significant the likelihood of non-convexities and
multiple optima increases, pp. 316-18.

> All in all, we are left with little reason for confidence in the ap-
> plicability of the Pigouvian approach, literally interpreted. We do
> not know how to calculate the required taxes and subsidies and
> we do not know how to approximate them by trial and error.[22]

This being the case, the argument is made in favor of a less precise tax system designed to achieve some reasonable "set of minimum standards of acceptability."[23] Even this may require severe measurement problems but surely no worse than the next best alternative of direct controls.[24] And besides, the tax alternative alleviates the need to use the police or the courts and can be shown "at least in principle, to achieve decreases in pollution or other types of damage to the environment at minimum cost to society."[25]

It is important to note that if we regard the polluter as the active agent, *the tax solution to a pollution problem implies an L law.* The right to pollute, though attenuated by the imposition of a tax like the many other rights, is given to the polluter. So, at least in the public goods case, the social-cost approach implies unambiguously the assignment of rights under an L law. I turn now to a critical assessment of the efficiency framework and the social-cost approach it implies.

Wealth Effects and Second Best

Certain well-known problems with the efficiency framework exist, and these apply in a fairly static, unchanging world. It will be remembered that one of the crucial assumptions necessary for the Coase theorem was that wealth effects were absent (or, at least, negligible). This assumption is often justified with the argument that though the assignment of rights may affect the distribution of wealth, as long as it does not affect the allocation of resources to alternative uses, the distribution question should be kept separate. (The concept of ex ante compensation, also relevant in this context, will be examined in the next section.) But what if the assignment of rights does affect resource allocation, as it plausibly will when wealth effects are significant?

That it should do so is quite obvious upon reflection. The ability to pay, by influencing relative prices, determines the allocation of resources to their highest valued uses. Thus, unless individuals are

[22] Ibid., p. 318.
[23] Ibid., p. 318.
[24] Beckerman, "Pricing," p. 53.
[25] Baumol, "On Taxation," p. 319.

very similar in their expenditure patterns, any change in wealth will affect relative prices and, therefore, resource allocation. But if relative prices are not variant with respect to the distribution of wealth, they will be affected by the assignment of property rights. As shown originally by Scitovsky,[26] and reiterated many times since by writers on welfare economics, the lack of invariance of relative prices with wealth distributions implies that the Kaldor-Hicks criterion of allocative improvements may yield ambiguous (actually contradictory) results. If situation A is allocatively superior to situation B in that everyone could be made better off by a movement from B to A, a movement from A to B may yield the same result. This apparent contradiction results from the fact that the relative prices that are used to value the outputs in the two situations are different. At one set of prices the goods and services in situation A are valued higher than those in situation B, while at another set of prices the ranking is reversed.

The consequences of this are particularly noteworthy in the context of pollution. The importance of wealth effects on the outcome of any rights assignment can be assumed negligible only if the impact of the assignment on people's overall utility is small. This is often not the case for pollution externalities. As Mishan puts it, "What a person in a noisy environment is willing to pay for continuing quiet may be only a fraction of the minimum sum he is willing to accept to put up with the existing noise, or with the additional noise expected to be generated by a highway or airport to be built near his home."[27] In these cases the choice between an L or an L law will have more than a negligible effect and may indeed imply the difference between the *existence* of a pollution externality and its total absence and that *both situations are, from the property rights viewpoint, efficient.*

The other important assumption underlying the efficiency approach is the absence of significant distortions elsewhere in the economy. The calculation of social costs and benefits is profoundly affected if this assumption is violated. In a world of distortions, where prices are not general equilibrium competitive prices that reflect marginal costs, the imposition of a Pigouvian tax or a liability that would achieve efficiency if distortions were absent may *reduce* efficiency. Assume a polluting factory is producing more than the optimal amount of pollution. Assume further that there are

[26]Tibor Scitovsky, "A Note on Welfare Proposition in Economics," *Review of Economic Studies* 9 (November 1941): 77-88.
[27]Mishan, "The Folklore," p. 701.

two outputs in the economy complementary to our factory's output and that because of monopoly or taxes (or both) their prices *exceed* their social marginal costs by different proportions. In such circumstances the factory's output *should* be priced below its marginal social cost (to offset the high-priced complements) so that a Pigouvian tax *will reduce efficiency*. Distortions in the factory market may be even more intractable.[28] These problems of second-best point to the high probability that any attempt at a finely tuned solution is bound to face hopeless information problems in the real world.

It might be thought that it would nevertheless be possible to approximate the general equilibrium outcome by a series of partial adjustments. The remarks of Baumol, quoted above,[29] should dispel that hope. In more general terms, outside of equilibrium there is no way to know if any move is efficiency-enhancing or not.[30] In fact, as we shall see now, the notion of efficiency makes little sense outside of general equilibrium.

The Elusiveness of Efficiency

The concept of efficiency is an appealing one. To be efficient would seem to be a noble aim, achieving any given goal at minimum cost. And when some goals are shared by the members of society, the minimization of "social cost" commends itself. Yet when we move from the perspective of the individual, where the concepts of efficiency and cost make some sense, to that of the society, a careful examination reveals that the efficiency cost-minimizing framework is seriously misleading. This has emerged from a number of recent critical articles on the efficiency of the common law.[31] Though not all of these contributions are relevant to my topic, it is impossible to report on even all those that are. Some

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[28] See Mario Rizzo, "Law Amid Flux: The Economics of Negligence and Strict Liability in Tort," *Journal of Legal Studies* 9 (March 1980): 301-02; and idem, "The Mirage of Efficiency," *Hofstra Law Review* 8 (Spring 1980): 652-53.

[29] At note 21.

[30] See Mario Rizzo, "Uncertainty, Subjectivity, and the Economic Analysis of Law," in Rizzo, ed., *Time*, pp. 84-85.

[31] Mario Rizzo at note 28 as well as various articles in the symposia editions of *Journal of Legal Studies* 9 (March 1980) — "Change in the Common Law: Legal and Economic Perspectives," *Hofstra Law Review* 8 (Spring 1980) — "Symposium on Efficiency as a Legal Concern," and 8 (Summer 1980) — "A Response to the Efficiency Symposium." Also, Murray Rothbard, "The Myth of Efficiency," and John B. Egger, "Comment: Efficiency Is Not a Substitute for Ethics" in Rizzo, ed., *Time*, chaps. 4 and 5, respectively.

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brief remarks on the essential points, nevertheless, are of immediate relevance.

In my remarks so far I have been treating the efficiency approach (to the law and to Pigouvian taxation) as a normative theory, a theory of optimal policy. In the literature there has been a tendency to move from normative proposition to assertions about the actual evolution of the law in practice, claiming, with greater or lesser confidence, that the common law tends to be efficient.[32] Any problems relating to the efficiency concept as a normative ideal will be seen to apply with equal force to the concept of efficiency as an empirical standard.

Efficiency is understood here to mean the maximization of social wealth as measured by ability to pay.[33] Any administrative decision-maker, whether it be a judge imposing a liability or an agency imposing a tax, to maximize social wealth must calculate the social benefits and costs consequent upon its actions. If we treat social costs as the social benefits forgone, we may talk simply of maximizing social benefits or minimizing social costs. This presumes that social cost is (at least in principle) an identifiable entity. The notion of cost in general bears further examination.

Most, if not all, economists would agree that when the term "cost" is used it should refer to what is often loosely called "opportunity cost." The implications of a rigorous opportunity-cost concept for much of modern economic theory would, however, be too devastating to bear, so that most economists are thoroughly inconsistent when it comes to applying the concept of cost. Opportunity cost correctly understood[34] refers to the *individual* decision-making

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[32]See Richard Posner, "The Ethical and Political Basis of the Efficiency Norm in Common law Adjudication," *Hofstra Law Review* 8 (Spring 1980): 487-508; Paul H. Rubin, "Why is the Common Law Efficient?," *Journal of Legal Studies* 6 (1977); George L. Priest, "The Common Law Progress and the Selection of Efficient Rules," *Journal of Legal Studies* 6 (1977); among others.

[33]See, for example, Ronald M. Dworkin, "Is Wealth a Value?," who writes "Wealth maximization as defined is achieved when goods and other resources are in the hands of those who value them most, and someone values a good more only if he is both willing and able to pay in money (or in the equivalent of money) to have it." *Journal of Legal Studies* 9 (March 1980): 191. I should add that though Dworkin is highly critical of the efficiency approach, this definition is not contested by those he is criticizing. This is clear from Richard Posner, "Utilitarianism, Economics, and Legal Theory," *Journal of Legal Studies* 8 (January 1979): 119-120.

[34]For a most complete statement see James M. Buchanan, *Cost and Choice* (Chicago: Markham, 1969). Also relevant to this reviving tradition is James M. Buchanan and G.F. Thirldry, eds., *L.S.E. Essays on Cost* (New York: New York University Press, 1973). I have treated this in P. Lewin, "Perspectives on the Costs of Inflation," *Southern Economic Journal* 48 (January 1982).

process. In making a rational choice at a point of time, the individual must weigh the perceived alternatives. The cost of choosing any one alternative is related to the opportunities sacrificed by forgoing all the others and may be expressed as the utility forgone on the next best alternative. From this perspective three propositions about cost follow. 1) Cost is borne exclusively by the decision-maker. Obviously, one person's decision may influence the costs borne by another but, if understood correctly, any cost must attach to an individual out of choice. 2) Cost is inherently subjective. First, it is expressed in utility terms making it noncomparable across individuals if adherence to an ordinal utility concept is to be maintained. Second, cost implies subjective expectations. It refers to the *perceived* alternatives; it relates to an *imagined* future. The alternatives at any point of time exist only in the mind of the decision-maker, and although there may be some degree of consensus concerning hypothetical imagined future prospects, there almost certainly will remain a divergence of expectations. Thus, costs cannot be measured by an outside observer. 3) Cost is unrealizable. Once a choice is taken the hypothetical imagined future evolves with time into the *actual* future and the displaced alternatives cease to exist. There is no way to verify if they were really alternatives. Stated differently, the fact that the concept of costs involves counterfactual alternatives renders it unrealizable.

This insistence on a thoroughgoing, subjective opportunity-cost concept may strike the reader as excessively purist. Its importance may be sharpened, however, if we attempt to relate it to the notion of cost more common in everyday speech (and in applied economics).

Once a decision is taken, certain consequences, like money outlays, follow. These are not, strictly speaking, costs. They are choice-induced, not choice-influencing; they do not represent forgone opportunities in any direct way. In a very restricted sense and in very constrained circumstances, the money outlays and market prices that we observe can represent costs. If there are no nonpecuniary elements unique to individuals involved in the choices concerned, and if full competitive equilibrium prevails in an unchanging environment so that there is no uncertainty about future outcomes (i.e., imagined future alternatives can be taken to represent actual alternatives), then market prices will represent individuals' evaluations, at the margin, of the traded goods and services in terms of each other (and money). Of course, in terms of utility these costs are still not objectifiable, but in the postulated

conditions, they do represent an accurate reflection of traders' preference orderings and could be used to interpret, explain and perhaps predict hypothetical decisions. But these objective costs are the *results* of choices that occur in equilibrium (where plans and outcomes coincide). They cannot reflect perceived alternatives outside of this equilibrium. Outside of equilibrium, perceptions of alternatives differ and cost is inescapably subjective.

In any actual dynamic economic process, where the future is, in some respects at least, radically different from the past (such as is often the case with technological changes that could not have been anticipated), expectations will diverge. A strict application of the opportunity-cost concept is thus bound to lead one to the conclusions that costs are individual and private and cannot be "social." The social-cost concept requires the summation of individual costs, which is impossible if costs are seen in utility terms. The notion of social cost as reflected by market prices (or even more problematically by hypothetical prices in the absence of a market for the item) has validity only in conditions so far removed from reality as to make its use as a general tool of policy analysis highly suspect.

In externality situations where the disputing parties are small in number, the efficiency approach would favor a common law solution requiring the court to simulate a market condition by awarding the right in question to the party who would have bought it if a market devoid of transactions costs had existed. In light of the forgoing discussion on the nature of costs, one may ask not only how this is possible but, more pertinently, what notion of efficiency is being served here. In making such a determination the court would have to weigh the consequences of alternative resource allocations and somehow estimate and evaluate their effects. Among the problems that exist are the following:[35] 1) The time frame is arbitrary. Over how long a timespan are the forgone alternatives projected? As the doctrine of "the last clear chance" applied to accidents illustrates,[36] the "efficient" solution may vary with time frames. Also, the longer the horizon chosen, the more uncertain the outcomes. How is one to know which timespan "the market" would have chosen?

2) Often what is being disputed is the very nature of the external effects. Where, for example, eminent scientists may disagree about

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[35] In addition to the articles by Rizzo, Rothbard and Egger referred to above, see Gerald P. O'Driscoll, "Justice, Efficiency, and the Economic Analysis of Law: A Comment on Fried," *Journal of Legal Studies* 9 (March 1980): 355-66.
[36] Rizzo, "Law Amid Flux," p. 300.

the effects of low-level radiation and acid rain, how are the courts to decide? Where it is possible to attach a probability to the likelihood of a harm of a specified market value occuring, such as in insurance situations where the events in question are part of a homogenous class of repeatable events, the notion of "least-cost insurer" may be meaningfully applied in pursuit of an efficiency standard.[37] But where the events in question are inherently unforeseeable in that they are in no meaningful sense part of a class of repeatable events over which a probability distribution could be defined, no efficiency criterion is possible. Whatever the court does could be construed as efficient given its own (subjective) probability assignment. In this category of events would fall all those harms (including irreversible environmental catastrophes) whose long-term effects are uncertain (sometimes because they are so new that experience is totally lacking). If one adopted the principle that no harm will be assumed unless and until relevant information is available, one applies an L law by default. Mishan has observed that "such a principle amounts to the methodological rule: When in doubt, continue to pollute."[38]

Even if the effect of the externality could be accurately identified, it would still be impossible to determine the least-cost method of pollution reduction in a dynamic setting; for what is least-cost with today's technology may be relatively expensive with tomorrow's.[39] And whose cost are we talking about? The cost of any option will vary among individuals insofar as their value scales and expectations of future technological development differ. A new pollution control device may be invented by the factory if the right to be free of the pollution is awarded to the laundry, but the incentive to do so is diminished if pollution rights are awarded to the factory. While the laundry then has the incentive to do so, it may be at a serious disadvantage being unfamiliar with the factory's production process and unable to learn about it except at considerable cost. As Rizzo has remarked, what is involved is "fundamentally a question of predicting the future course of technology under alternative incentive arrangements. Clearly this is an impossibility because the growth of technology is essentially the growth of knowledge, and future knowledge, by definition, cannot be obtained in the present."[40]

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[37] Where events that cause harm are recurring with predictable frequency in large populations, assigning liability for harm to the least cost insurer would be efficient in the long run in that the "optimum" level of precautions would be taken.
[38] Mishan, "The Folklore," p. 701.
[39] Rizzo, "Law Amid Flux," p. 307.

All this applies with even greater force to the case of an externality affecting many parties. Here the notion of social cost is even more obscure. If it is an administrative agency that is charged with the responsibility of implementing the efficient policy, it will face the same problems of having to choose among time frames across disparate individual evaluations in the face of an inherently uncertain technological future. It is important to emphasize that it is precisely where administrative action is called for that it is least able to apply an efficient rule. For an efficient rule implies simulating the market, but market data on which to base a decision are absent owing to the "market failure" that motivated the administrative action in the first place.

The foregoing suggests that any perception of efficiency at the social level is illusory. And the essential thread in all the objections to the efficiency concept, be it wealth effects, distortions, or technological changes, is the refusal by economists to make interpersonal comparisons of utility. Social cost falls to the ground precisely because individual evaluations of the sacrifice involved in choosing among options cannot be compared. If we were willing by a leap of faith to compare hypothetical satisfactions (accepting at the same time the policy-maker's projections for the future), the notion of social cost might be salvaged, but only if it is understood as a metaphor for the real or hypothetical decision-maker's cost. Our reluctance to compare utilities reflects a very basic theoretical conviction that individuals should be taken to be the best judges of their own welfare. Thus, we consider market transactions as welfare-enhancing (assuming no spillovers) because they are entered into voluntarily. The principles of autonomy and consent come to mind. From this perspective it is difficult to see how any involuntary transaction (one that does not occur through the market) could be judged efficiency-enhancing.

Posner has attempted to deal with this problem by suggesting that an efficient legal system, by reducing social costs, would provide everybody with an equal chance to gain sometime, somewhere from the "better" system.[41] So an individual harmed without compensation by an externality may, nevertheless, be considered to

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[40] Ibid., p. 308. There is a related point. If there is uncertainty as to who is the long-run, least-cost avoider of a harm, and if the court is known to be operating under an efficiency standard of liability, then there is necessarily uncertainty about who is likely to be held liable. This will inhibit the operation of the "correct" incentives in which proponents of the efficiency approach put such store.

[41] Posner, "The Ethical," pp. 491-94.

have consented to it on the grounds that the shoe might have been on the other foot and probably will in some future situation. As a result of the more efficient system, the pie is bigger and all have a chance of sharing it. In this sense compensation has been made ex ante. "If there is no reliable mechanism for eliciting express consent, it follows, not that we must abandon the principle of consent, but rather that we should look for *implied consent, as by trying to answer the hypothetical question whether, if transactions costs were zero, the affected parties would have agreed to the institution.* This procedure resembles a judge's imputing the intent of parties to a contract that fails to provide expressly for some contingency."[42]

Even if one is willing to forgo the objection (of which Posner is aware) that implied consent is not express consent on the grounds that it is too "costly" to obtain express consent, how is one to infer implied consent for a more efficient system when, as I hope I have shown, the very concept of efficiency as applied to society is meaningless? As Kronman pertinently asks, "[H]ow are we to distinguish those cases in which there has been ex ante compensation from those in which there has not?"[43]

One is left with the strong impression that if efficiency means anything, then *rights are logically prior to efficiency.* Efficiency is a result of maximizing social wealth, and social wealth is evaluated by individuals expressing their ability and willingness to pay. But ability and willingness to pay depend on wealth, and wealth depends on prior rights assignments. Thus, the way in which individuals would evaluate any resource depends on the prior assignment of rights. To attempt to base an entire system of law on such a flawed concept as social wealth seems to be an exercise in futile circularity. Yet, as we shall see, the utilitarian impulse is a difficult one to avoid, especially in the context of pollution externalities.

Strict Liability

If Not Efficiency, Then What?

An alternative basis on which to deal with pollution-type questions may be provided by a strict liability approach to rights.

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[42] Ibid., p. 494.
[43] Anthony T. Kronman, "Wealth Maximization as a Normative Principle," *Journal of Legal Studies* 9 (March 1980): 227-42. See also the penetrating critique of Posner's "ex ante compensation" concept by Ronald Dworkin "Why Efficiency," *Hofstra Law Review* 8 (Spring 1980): 573-90. Also see Rizzo, "The Mirage," pp. 654-58.

Recently Richard Epstein in a series of articles has attempted to provide a systematic account of how the principles of strict liability could be applied to various circumstances.[44] Such a system is designed not to assign but to discover rights (on the basis of certain, sometimes unstated, ethical presumptions) or to discover when rights have been invaded in order to apply "corrective justice."

Epstein suggests basic common sense be used as an aid to determining the correct nature of causes and responsibilities. Causal principles are needed to identify the source of any invasion of rights. "A is liable, at least prima facie, if he is the cause of B's harm, regardless of A's ability or inability to avoid the harm . . ."[45] Esptein defines his causal ideas in terms of four simple paradigms: 1) A hit B; 2) A frightened B; 3) A compelled B to hit C; and 4) A created dangerous conditions that resulted in harm to B. Of these, 4) and 1) seem to hold the most relevance to pollution problems.[46]

If, as I have argued above, the efficiency arguments emanating from the Coase theorem fail in their attempt to provide a consistent basis for the conduct of policy to deal with pollution, it seems natural that causal principles should re-enter the picture. By definition, he who violates the rights of another causes him harm. So, once again, rights must be defined prior to any legal analysis. Epstein appears to favor a basic libertarian, natural-rights view that everyone is the unambiguous owner of his (her) body and of property acquired through voluntary exchange or original appropriation.[47] And in most cases involving a small number of individuals, applying this notion of rights to the four basic paradigms provides unambiguous criteria for establishing a prima facie case of harm. The only relevant question is, did A violate B's rights or cause C to

[44] Richard A. Epstein, "A Theory of Strict Liability," *Journal of Legal Studies* 2 (January 1973); "Defense and Subsequent Pleas in a Theory of Strict Liability," *Journal of Legal Studies* 3 (January 1974); "Pleadings and Resumptions," *University of Chicago Law Review* 40 (Spring 1973); "International Harms," *Journal of Legal Studies* 4 (June 1975); "Nuisance Law: Corrective Justice and Its Utilitarian Constraints," *Journal of Legal Studies* 8 (January 1979).

[45] Mario J. Rizzo, "Foreward" in Richard A. Epstein, *A Theory of Strict Liability* (San Francisco: Cato Institute Reprint, 1980), p. xi.

[46] Epstein, "Nuisance Law," p. 56. As Rizzo remarks (ibid., p. xi) these paradigms presuppose an ability to recognize an instance of any one of them and are perhaps better thought of as *classes* of causal relation.

[47] Epstein, "Nuisance Law," p. 52. "Each person owns his own body as a natural right. . . . It is more difficult to obtain agreement about the correct rules that in principle govern the acquisition of land or chattels. But for the purpose of tort law it is sufficient that the system has, in fact, settled upon the criterion of first possession . . . . coupled with rules that govern the transfer and alienation of the property rights so created."

do so? This involves a two-step procedure: 1) Identify an event or series of events that harmed B; and 2) connect this to an act or acts of A. Though there may be considerable uncertainty involved in both steps, purely economic considerations apparently do not enter into this phase of the analysis at all. It is necessary in the first step to specify the type of conduct that will be considered a violation of a plaintiff's rights. Some cases are clear-cut, like physical violence, extortion, and simple trespass. But some cases are more problematic. Among these are those that are classified as nuisances. "Nuisances are invasions of the plaintiff's property that fall short of trespasses but which still interfere in the use and employment of land. The cases make it quite clear that the forms of nontrespassory invasions are protean: Fumes, noises, smells, smoke, gases, heat, vibrations, and kindred activities."[48] In this sense pollution would appear to be a nuisance type invasion.

Having identified a nuisance, it is then necessary to link it to the defendant's actions. The ability to demonstrate fulfillment of steps 1 and 2 will then establish a prima facie case. In Epstein's scheme defenses can be made on the same paradigmatic grounds as the complaint. So, "B compelled A to hit him" is a valid defense against "A hit B." Other defenses exist as well: They are trespass and assumption of risk (either consensual or unilateral by the plaintiff). But if the plaintiff prevails, damage must be assessed, and some type of economic reasoning cannot be avoided. Summarizing, under this view, the investigation of the rights involved would appear to be prior to any examination of damage. Once an invasion has been established and a party found responsible, the question of relief can be addressed as a separate issue.

It should be emphasized that whenever the court would have to estimate the compensation necessary to make the plaintiff whole (whether injunctive relief was used or not) it would face the same difficulties discussed above in connection with the attempt to achieve an efficient outcome. Counterfactual assumptions cannot be avoided whenever a harmful event (which might not have occurred) is analyzed. The damage assessed must then be related to

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[48] Ibid., p. 53. But compare Murray M. Rothbard, "The vital fact about air pollution is that the polluter sends unwanted and unbidden pollutants . . . . *through* the air and *into the lungs of innocent victims*, as well as onto their material property. All such emanations which injure person or property constitute agression against the private property of the victims. Air pollution, after all, is just as much aggression as committing arson against another's property or injuring him physically. Air pollution that injures others is aggression pure and simple." *For a New Liberty* (New York: Collier Macmillan, 1978), p. 256.

the difference between the state of the world as it actually is and as it *would have been* had the event not occurred. And since the parties have opposing incentives influencing the value they place on the harm, the court cannot but impose its own. In doing so it is necessarily attempting to empathically identify with the plaintiff and arrive at the pecuniary equivalent of the utility lost. This would appear to be an unavoidable ingredient of any justice system.

Still, a system of strict liability seems to preserve the advantage that though damage remains, to a greater or lesser extent depending on the complexity of the case, an uncertain element, the rights involved are clearly delineated and do not depend on any counterfactual determinations. The system should always apply an $\overline{L}$ law rather than an L law and should always be inclined to grant injuctive relief against violations of rights; so that apart from the estimation of damages, the system does not contain that element of arbitrariness in the assignment of rights that inheres in the efficiency arguments.

Two difficulties, however, remain. The first is that it is not always obvious when a right has been violated, although from a libertarian standpoint, common sense goes a long way. Thus, the blocking of a view, the blocking of light, and the creation of aesthetically displeasing structures are among a similar class of actions that do not constitute a violation, while the shining of light, creation of noise, etc., do. The physical invasion by a particle or wave of light, noise, or matter would seem to make the difference. Pollution occurs when many such invasions take place, creating direct harm or dangerous conditions.[49]

The second difficulty is much more important. An invasion may occur where the damage is small and/or the transactions and/or litigation costs (including the costs of administering the system) are high. In such cases there is a temptation to use economic criteria to implicity redefine and attenuate rights. This is particularly true in public goods situations where, for example, there are many pollution victims. "The nuisance law, unlike the law of accidents, does present abundant situations in which . . . utilitarian constraints militate in favor of redefinition of property rights and liability rules without explicit compensation."[50]

The problem seems to be that certain situations, while being clear cases of rights violations under a strict liability standard, are judged by most people to be generally (socially?) beneficial. Epstein

[49] Epstein, "Nuisance Law," pp. 56, 60-65.
[50] Ibid., p. 82.

presents some "rules" by which the strict liability outcome may be
mitigated, among which are the "live and let live rule" and the
"locality rule."[51] These rules can be briefly summarized as follows:
1) Live and let live: ". . . those acts necessary for the common and
ordinary use and occupation of land and houses may be done, if
conveniently done, without submitting those who do them to an ac-
tion . . . It is as much for the advantage of the owner as of another,
for the very nuisance the one complains of, as the result of the or-
dinary use of his neighbor's land, he himself will create in the or-
dinary use of his own, and the reciprocal nuisances are of a com-
paratively trifling character."[52] 2) Locality rule: "The function of
the locality rule is to relax the basic nuisance rules where parallel
uses by nearly all concerned insure the existence of implicit in-kind
compensation."[53]

It should be clear that the ethical basis for these rules is similar to
that advanced by Posner in justification of an efficiency standard,
namely ex ante compensation and, therefore, implicit consent. As
such, it is subject to the same objections. Instead of just deciding
whether an invasion of rights has occurred, the court must now
decide whether the appearance of such a violation is actually belied
by the presence of ex ante compensation. And the latter thus calls
for a judgment as to the social value of certain activities *in the pro-
cess of determining rights*. Might it not be better to maintain as pure a
theory of corrective justice as possible when determining rights and
leave such speculations to the damages? In the conditions pertain-
ing to the two rules in question this would imply that the incentive
to litigate would be negligible and the problem would thus take care
of itself. On the other hand, where (as in the "live and let live"
situation) "the reciprocal nuisances are of a comparatively trifling
character," the expected benefits of litigation are small. On the
other hand, where large numbers are involved, unless the expected
payoff is large, the transactions costs of joint litigation are likely to
be prohibitive. This last consideration is mitigated to the extent that
class action litigation is possible. But the conditions necessary to
provide a basis for class certification are unlikely to apply in very
many situations of this type.[54]

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[51] Ibid., pp. 82-90.
[52] Ibid., p. 83, quoting Baron Bramwell's opinion in *Bramford* v. *Turnley* 3 B. & S. 55,
122 Eng. Rep. 27 (1862) at 83-84.
[53] Ibid., p. 90.
[54] In fact, as Rothbard points out (*For a New Liberty*, p. 258), class action suits are pro-
hibited for air pollution cases.

An alternative (or complementary) approach is to use the concept of *homesteading* to define rights. What this implies is that the first occupier and user of a resource acquires a property right in that resource. One would extend this line of reasoning to air pollution, noise pollution, and so on.[55] Thus, where a producer acquires land and has preceded his neighbor in emitting air pollution, the neighbor has "come to the nuisance" and has not suffered any legal harm. Similar easements in a certain level of noise emission could be acquired.[56]

This approach implies the establishment of an $\overline{L}$ law but with stringent standards of proof to be borne by the plaintiff. But sometimes it appears impossible to establish an $\overline{L}$ law. Epstein gives the examples of highway traffic delays and automobile air pollution. The damages are "public" and private law mechanisms are apparently incapable of dealing with them. "When these conditions occur direct public regulation is the only possible way both to reduce harmful outputs and to equalize treatment across individual cases."[57] We are back to a Pigouvian tax and an implicit L law.

What Epstein fails to emphasize is that the root of the problem is that the highway and the air are not privately owned. Technically, there is no problem imagining private ownership of highways. And Rothbard has argued,[58] for example, that there are no "true" public goods of any kind, certainly not in water or on the land, which can, in principle, be parceled out. But what about the air? Rothbard suggests that allowing class action suits (under an $\overline{L}$ law) would provide the remedy.[59]

But having said this, two final difficulties remain: 1) Although one may agree that the bounds of human ingenuity in devising schemes of private property rights have hardly been stretched, there do appear to be situations that defy all such schemes. Examples are of the multiple tortfeasor type, like automobile air pollution. Here one may have to reluctantly agree that public regulation seems inevitable.[60] 2) A related point. Even it if were possible *in principle* to establish comprehensive property rights, in practice this will not be done. Our current difficulties in this regard may simply reflect our

[55] For a detailed argument see Murray N. Rothbard, "Law, Property Rights, and Air Pollution," *Cato Journal* 2 (Spring 1982): 55-99.
[56] Ibid.
[57] Epstein, "Nuisance Law," p. 7.
[58] "For a New" pp. 255-259.
[59] Ibid., p. 259.
[60] See Dolan, *Tanstaafl*, chap. 3, for an automobile pollution control scheme that preserves many of the features of the market.

refusal to do so in the past.[61] Automobiles would not have been made the same way if manufacturers had been enjoined from producing pollution damage in the distant past. Too many activities now common would be subject to injunction. How does one proceed, under a system of corrective justice, in such an imperfect world? I may conjecture that it would not entail the abandonment of corrective justice principles but merely the recognition that since they cannot be (or will not be) implemented, second-best alternatives must be considered. But if we can avoid making a virtue out of the need to compromise, we may succeed in the future in reducing the need to compromise.

[61] Although not necessarily. Sometimes our current difficulties may reflect the changing state of knowledge. We may at one time adopt a technology that we believe to be perfectly safe and only later (when it is already firmly integrated into the industrial infrastructure) learn that it is hazardous and invasive.