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COASE, SOCIAL COST AND STABILITY: AN INTEGRATIVE ESSAY*

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The economic value of normative legal judgments, especially those promoting dynamic stability of socio-economic behavior, may be the most curiously neglected issue emerging from debate of Coase's proposition.[1] Present neglect undoubtedly springs in part from Coase's article in which he, the conservative "free market" economist, ventured with theory in hand into what Prosser, the torts lawyer, terms "an impenetrable jungle"[2]—the law of nuisance externalities.[3]

In addition to carrying the attack to Pigou, welfare economics, and social cost, Coase rummaged theoretically through four English nuisance cases[4] and made two observations. First, he observed that nineteenth century English courts relied upon various doctrines such as "lost grant" in making judicial judgments about the liability of the nuisance emitter. By so doing, Coase then argued, courts avoided the real issue: an efficient allocation of emitter and receptor resources where nuisance externalities are present. Legal doctrine, although historically evolved through iterative judgments defining nuisance rights and duties, was being used to mask what were to Coase essentially economic interdependencies among the production and consumption functions of emitters and receptors.

Secondly, Coase observed theoretically from a systems viewpoint that full liability law (L) and no liability law (NL) were interchangeable ("neutral") because both would identically allocate emitter and receptor resources, at least in the short run. Of course, if an emitter were not directly responsible for pollutant damages as under NL law, external costs and interdependencies created by his consumption or production function also would be beyond the direct subject matter jurisdiction of courts and legal process. Since the emitter would be immune from legal responsibility, potential plaintiff victims could not

* I would like to express appreciation to Professor Ralph d'Arge whose work and ideas have greatly influenced my own thinking about the economics of property rights.

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1. Coase, *The Problem of Social Cost*, 3 J. Law & Econ. 1 (1960). Unless otherwise noted, all references are to Coase's theoretical analysis contained in Sections 1-5 of his paper.

2. W. Prosser, Law of Torts §86, at 571 (4th ed. 1971).

3. In this paper only the law of private nuisance is considered. Coase's now famous example of the rancher's cattle errantly straying into a farmer's cornfield obviously constituted a physical intrusion classified as a legal trespass.

4. Two of the cases which bore the brunt of his theoretical criticism are discussed in Section II of this paper.

entertain suits in nuisance (or trespass), and such quaintly archaic doctrines as "lost grant" could be relegated to the footnotes of legal history.

Thus if two antithetical systems of law, full liability and full immunity, L and NL, would yield identical equilibrium allocations of bilateral resources, two conclusions may be drawn. One is that given the costless operational assumptions of perfect competition,[5] it makes no difference to a detached, god-like economist which liability system is used to govern pollution; either system is equally efficient. A second, more radical conclusion would flow invoking the principle of Occam's razor: a simpler system is preferable over a more complex system of identical efficiency *ceteris paribus.* If it makes no difference and if people and markets behave in reasonable correlation with perfect competition assumptions, why make emitters liable . . . thereby premising legal jurisdiction and the accompanying entourage of judges, lawyers, litigation, and curious doctrines? According to free market economists, the market is the model if only government, courts, and other third parties would leave emitters and receptors alone long enough to settle pollution disputes by bargaining and contracts.

It needs to be emphasized, nonetheless, that Coase's proposition raises rather than resolves the singular policy issue of environmental economics, law, and planning: who should bear the risk and liability for environmental degradation—emitters or receptors? To understand the policy issue in its totality, as Coase eventually concluded,[6] entails a more comprehensive set of premises and objectives for law and economics. The proposition's basic defect, for example, is its begging of the policy question and circularity of argument. If it is supposed that full (L) and no (NL) liability rules neutrally allocate short *and* long term resources, the question of which is preferable cannot be answered without considering normative policies. Normative considerations, *e.g.*, curious legal doctrines, however, are suspect and to be criticized as irrelevant to allocative efficiency.

Accordingly, not very much is discovered analytically by hypothesi-

5. Of course, liability rules are neutral only in a world which does not exist, a world where people are rational; where they have or can obtain without the cost of time, effort or money all the information they need to exercise their rationality; and where they can freely bargain without any effort or expense (other than the consideration exchanged in the bargaining process) with those whose activities bear on their interests. Obviously, these suppositions which underlie the assumption of costless market transactions make that assumption "a very unrealistic" one.

Krier, *The Pollution Problem And Legal Institutions: A Conceptual Overview,* 18 U.C.L.A. L. Rev. 429, 434-435 (1971).

6. Coase, *supra* note 1, at 44.

zing that L and NL might identically allocate short and long term equilibrium outputs. Clearly, L and NL would also be codes governing socio-economic behavior and their regimes would incorporate behavioral assumptions, dynamic properties, goal orientations, and normative choices. To say that before an externality occurs L and NL are allocatively interchangeable is equivalent to saying two antithetical flight plan programs could be inserted into the computerized guidance system of a spacecraft at any moment prior to lift-off. Given sufficient time either plan could direct the spacecraft to its ultimate destination and the vehicle would again come to rest. Nevertheless, a basic question is inescapable: how would the dynamic stability of one flight plan differ from those of the other over time?

Why "stability"? A pithy reply is suggested by Vickers:

> As all policy makers know from experience, policy does not consist in prescribing one goal or a series of goals; but in regulating a system over time in such a way as to optimize the realization of many conflicting relations without wrecking the system in the process.[7]

Regulation of systemic socio-economic behavior, then, is a two-fold exercise in policy dynamics. One thrust is to stimulate freedom for pluralism but also to stay within tolerable limits. The other concerns the appropriate "fit" of governance rules to those being regulated. Both thrusts are inseparably related, and this paper considers them to raise policy issues as to the comparative stability, and thus appropriateness of "fit", of L and NL law in regulating socio-economic behavior over time. For instance, no assumptions should be made about the relative stability of a long run equilibrium state. Although it can be assumed *arguendo* that L and NL would achieve identical long run equilibrium allocations, it does not follow that they would have the same mechanics of process. One system of law appears theoretically to be more stable, *i.e.*, more efficient dynamically, because fewer corrective adjustments are needed to preserve the equilibrium state.

As an analogy suppose the hypothetical spacecraft can reach its final destination despite alternate flight plans, given sufficient time, but with comparatively different costs for energy and resources consumption, passenger amenities, and corrective adjustments in flight. Making a *ceteris paribus* disclaimer, the more stable flight plan is preferable because it would be more dynamically efficient and comparatively, waste less energy, resources, and time in order "to get back on course". Moreover its greater dynamic efficiency might

7. G. Vickers, Freedom in a Rocking Boat 116 (1972).

better "fit" common socio-economic behavior patterns which need relatively stable environments.

The importance of socio-economic stability would be clearly evident if the spacecraft were a commuter shuttle. Passengers could choose between the comparative "prices" of stable and unstable flight plans, whether they wanted to arrive on time as scheduled, have a comfortable flight, and be relatively certain about the safety of their luggage. With sufficient repetition and experience, preferences would evolve for stable flight patterns capable of integrating relevant parties—passengers, cargo shippers, and spaceship company—into a common set of expectations. Their mutual expectations would make assumptions about the relationship of stability of process and normative judgments; particularly, about the value and decision-making patterns which correct deviant behaviors presenting unnecessary exposure to uncertainty, risk, and destructive injury. These common expectations thus would presuppose a dual purpose for the spacecraft. It would be a system which both organizes transport of persons and cargo over time and integrates divergent producer and consumer objectives for the joint benefits of avoiding the costs of dynamic instability.

SOCIAL STABILITY AND NORMATIVE LEGAL JUDGMENTS: THE COMMON LAW AS AN EVOLVED CONSENSUS

The basis of most contemporary environmental policies asserting the supremacy of legal power, including authority to regulate or prohibit economic functions, can be found in the English common law of nuisance. Private nuisances were regulated to realize a twofold legal purpose: to protect individual property rights in a manner which preserved more general community and societal interests. The English common law then was no mere dependent variable of the forces of historical, economic, or geographical determinism.

The common law was inductive, dynamic, and relativist in its thinking about the nuisances of intrusive emissions. It protected an individual property user from perceptible acts creating harmful and substantial injury to economic and incomensurate interests. It protected his initial endowments of property rights and uses from the burden of external pollution easements.

The common law was an instrument for guiding and regulating socio-economic behavior. Its instrumentalities were legal rights, uses, and expectations—how they were defined, distributed, and remedied. At its center was a bundle of fundamental societal norms: the ordinary man and his community, equity for receptors, and responsibilities for emitters. These normative principles were converted legally into

functional standards. But if the legal process were summarized as a single proposition it would, according to Salmond, reflect an ethical maxim: *Sic utere tuo ut alienmum non laedas*—So use your own land as not to injure another.[8]

In this section a conceptual overview is outlined for the pre-1900 period of the English common law cited and criticized by Coase in his paper. Some of the cases[9] used by Coase to advance his proposition are reconsidered for their multiple objectives, normative preferences, and functional implications for stabilizing socio-economic behavior. The real issue throughout this section is, should the emitter of intrusive pollutants be allowed to prevail and thereby influence, if not control, the rights, uses, and enjoyment of neighboring property?

In *Sturges v. Bridgman*,[10] a case criticized by Coase, the court upheld the legal interests of plaintiff, a practicing physician, to be free of intrusive noise and vibration emissions generated by defendant, an industrial confectionery. Defendant's business was attached to his house on Wigmore Street, London, while plaintiff's house was nearby on Wimpole Street. Moreover, emitter had used his property as a confectionery for at least 60 years while receptor had occupied his residence for 14 years. During the latter period receptor constructed a consulting room for examining patients which abutted a common wall with emitter. Since the new room abutted the confectionery, receptor not only physically altered a prior use of his property but also located a new, sensitive use well within a pre-existing zone of noise and vibration emissions. Receptor subsequently took emitter to court pleading serious personal disturbance and annoyance, and substantial interference with his professional practice. Specifically, he alleged the intrusive emissions prevented the proper auscultation (listening) for chest diseases and engaging "with effect in any occupation which required thought and attention."[11] He sought an injunction serving a twofold purpose: abating the noise and vibration nuisances, and precluding eventual establishment of an adverse (prescriptive) noise easement.

Receptor's request for a restraining injunction was affirmed on appeal. The decision summarily concluded:

> Individual cases of hardship may occur in the strict carrying out of

8. J. Salmond, Law of Torts 186 (2nd ed., 1910). Salmond's treatise is cited throughout this section. *See also*, Pollock, Pollock on Torts 385-416 (1901).

9. Of the four cases discussed (Section 5: The Problem Illustrated Anew), only the two dealing with private nuisances can be considered within the scope of this paper. The other two involve air current rights: Bryant v. Lefever 4 C.P.D. 172 (1878-1879); Bass v. Gregory 25 Q.B.D. 481 (1890).

10. 11 ChD. 852 (1879).

11. *Id.* at 853.

> the principle upon which we found our judgment, but the negation of the principle would lead even more to individual hardship, and would at the same time produce a prejudicial effect upon the development of land for residential purposes.[12]

Functionally, the injunction sought to preserve and encourage one kind of "stability" over another—a relatively recent, sensitive residential-professional use on Wimple Street from a well-established residential-industrial use on Wigmore Street. Thus, the court was helping guide the larger economic system as well as allocate emitter-receptor resources and wealth.

It did so by explicitly asserting two normative principles—avoiding the greater "individual hardship" and regulating nuisances which impair residential development. But the functional effect also was consistent with broader legal policies: receptor's property (use and enjoyment) and personal interests (professional and health) were preserved in accordance with existing neighborhood standards. Emitter was denied a possible prescriptive easement after 20 years and thus could not legitimize adverse, intrusive noise and vibration emissions.

Another, but minor, case was *Cooke v. Forbes*[13] in which plaintiff receptor, a manufacturer of cocoa nut fiber matting, complained of sulphuric hydrogen fumes released by defendant, a manufacturer of ammonia sulphate and carbonate. Emitter offered multiple defenses: recent construction of a valuable plant; exercise of extraordinary precautions; location within an industrial neighborhood; and unusual sensitivity of receptor's industrial process. The legal issue was settled:

> This is an instance of a person carrying on a manufacture which, if his neighbour had not happened to have another manufacture of great delicacy, probably would not have caused any injury to the neighbour. Still, he has not a right to injure his neighbour's manufacture at all. . . .[14]

As to the appropriate remedy, the court held plaintiff failed to justify need for an injunction but preserved his rights to seek money damages.

A. Social stability implies normative legal polices which transcend the operation of time and history.

In *Sturges* the age and history of emitter's land use could not prevail against receptor's assertion of superior property and personal

12. *Id.* at 865-866.
13. L.R. 5 Eq. 166 (1866).
14. *Id.* at 173.

interests. The court necessarily distinguished between the fact and the law of a nuisance. An emission may exist and intrude upon a neighboring property (a nuisance in fact) but be legally inactionable because the injury appears trivial or insubstantial. Salmond, the distinguished torts scholar of the period, pertinently stated the underlying rationale:

> Sensible men living with their fellows are content to bear with patience many minor inconveniences, which do not substantially interfere with the ordinary comfort of human existence; and by law all men, whether sensible or not, are bound to submit to annoyances of this kind.[15]

An emission becomes actionable when it rises above the petty irritants of everyday life to cause substantial injury to protectable interests. Confectioner's emissions could predate, establish an external zone of noise and vibration effects, and be tolerated legally until they interfered with the doctor's rights, uses, and enjoyment. Thus emitter's prior use, including an economic production function generating intrusive emissions, was conditioned upon and subordinate to interests defined and enforced by a public third party, the courts and law. The court further distinguished a permissible use from an impermissible nuisance: the confectionery could continue its use provided it abated the actionable emissions.

It was no legitimating defense for an emitter to echo doctrines of "first in time, first in right" or that receptor "came to the nuisance". Suppose hypothetically a blacksmith were to set up a forge in the middle of a barren moor and its noise were to penetrate the adjoining land owned by another. "Presently, this which is useless as a barren moor becomes available for building land by reason of the growth of a neighbouring town. . . ."[16] Thesiger, L. J., explained the legal policy against the claims of temporal determinism:

> It would be on the one hand in a very high degree unreasonable and undesirable that there should be a right of action for acts which are not . . . , and possibly never will be any annoyance or inconvenience . . . ; and it would be on the other hand in an equally degree unjust, and, from a public point of view, inexpedient that *the use and value of the adjoining land should, for all time and under all circumstances, be restricted and diminished* . . . . The smith in the case supposed might protect himself by taking a sufficient curtilage [a yard or courtyard] to ensure

15. Salmond, *supra* note 8, at 189.
16. 11 Ch.D., at 859.

> what he does from being at any time an annoyance to his neighbour. . . ." (Emphasis supplied.)[17]

Thus, the operation of an emitter's use over time and history was not absolute but relative to more common legal and socio-economic interests. Those interests did not preclude urbanizing land development[18] but denied claims of immunity for emitters in those instances where the effects of pollution would qualify the rights, uses, and enjoyment of land by present and future generations.

B. Social stability implies pluralistic policies which protect individual and neighborhood property interests from avoidable disturbances.

The court in *Sturges* regulated an inappropriate use so as to protect individual property interests and preserve neighborhood norms and expectations. But the process of its decision making implied translating normative legal and neighborhood considerations into three kinds of functional standards: ambient, performance, and equity. The initial societal premise was the "average" Englishman. The ordinary comforts experienced by this average man in the use and enjoyment of his property relative to his neighborhood at that time established the local ambient standard for environmental amenities. From the ambient standard was derived a sliding performance standard for emitters. No emitter was expected or required to exceed the level of legal responsibility and performance defined by the ambient standard. But he could deviate toward a lower level (*i.e.*, pollute more) provided the additional emissions caused no substantial injury to an actionable legal interest, or impliedly, receptors were compensated. Thus in *Sturges* Thesiger, L. J., states:

> . . . whether anything is a nuisance or not is a question to be determined not merely by an abstract consideration of the thing itself, but in reference to its circumstances; what would be a nuisance in *Belgrave Square* would not necessarily be so in *Bermondsey*. . . .[19]

Ambient and performance standards were not absolute and universal but relative and pluralistic because courts were ad hoc attempting

17. *Id.* at 865.

18. Consider Boulding:

> It is not enough to have a good legal concept of property; the bundles of rights that constitute property must be *secure* if economic progress is to take place. For as economic progress always, or almost always, involves the accumulation of physical capital, unless the people who accumulate caiptal are reasonably secure in its possession and administration, it will not be accumulated.

Boulding, Principles of Economic Policy 31 (1963).

19. 11 Ch.D., at 865.

zoning functions. Neighborhoods were classified; incompatible uses were segregated locationally.

Geographical location could not, however, confer legal immunity. Defendant emitters in *Cooke* stated that their's was "a neighborhood notorious for the number of its noxious manufactures."[20] Despite evidence that emitters had a modern plant, exercised "utmost precautions," and that the spills of sulphuric hydrogen were indeed accidents, defendants never asserted "a right to pour out anything deleterious upon their neighbours."[21] Similarly, the common law did not accept defenses alleging emitter was merely making a reasonable use of his property or that his present location was the most suitable place for his business.[22]

An equity standard attempted to protect receptors from injuries exceeding the ambient norm while not also conferring entitlements to superior amenities.

> The law of nuisance does not guarantee for any man a higher immunity from discomfort or inconvenience than that which prevails generally in the locality in which he lives. He who dislikes the noise of traffic must not set up his abode in the heart of a great city. He who loves peace and quiet must not live in a locality devoted to the business of making boilers or steamships.[23]

The ambient, performance, and equity standards thus expressed normative principles for equally protecting emitters and receptors. A receptor could not be protected from extraordinary or supersensitive uses from an emitter operating within the ambient norm. Conversely, the average receptor was protected against the extraordinary emitter. In short the three standards preceded and constituted a legal analogue to Pareto efficient criteria for resource allocations. Emitter's land uses were both protected and left open-ended so long as receptor suffered no net loss in his rights and amenities.

It should be emphasized, however, that the equity standard explicitly operated within a legal system seeking to preserve individual property rights and neighborhood amenities from extraordinary disturbances resulting from intrusive emissions. But disturbances could be prevented as well as remedied. Thus, to the extent that juries might reasonably classify a nuisance as among the background irritants of everyday life or that inappropriate land uses could be encouraged to shift locationally to other neighborhoods, that system also sought to avoid disturbances.

20. L.R. 5 Eq., at 170.
21. *Id.* at 174.
22. Salmond, *supra* note 8, at 193, 194.
23. *Id.* at 189.

C. Social stability implies a revealed set of societal interests which reference definition of private and social costs.

In both *Sturges* and *Cooke* arguments for economic determinism were rejected in favor of preserving the value of more sensitive uses. Private interests for maximizing the economic value of production and consumption were qualified and subordinated if necessary to an exercise of judicial power capable of preserving common legal and neighborhood interests. Social costs of externalities, *i.e.*, emissions intruding upon legally relevant property and neighborhood boundaries, were conceived to be relative and locationally pluralistic. Thus, the confectioner could not maximize the value of its production and wealth if that meant generating legally relevant social costs. Wimpole Street would not be permitted to develop according to its highest and best use if that meant substantially interfering with the common, more sensitive residential uses. *Cooke* indicates that full industrial immunity was not conferred. Accordingly, an irreducible minima of property rights and uses were guaranteed in order to preserve functional legal, economic, and neighborhood boundaries.

The *Sturges* and *Cooke* courts clearly were balancing and shaping numerous economic, historical, locational, private, neighborhood, and societal variables to achieve an appropriate "fit" of legal policies and the fundamental organization of socio-economic behavior. The instruments were legal rights and they defined the long run distribution of private and social costs. The cost distribution and balancing process, however, could be masked by normative judgments speaking of lost grants, prescriptive easements, ordinary men, and individual hardship. But because the common law courts would not immunize emitters of legally relevant externalities, they were severely criticized by Coase. His comment on *Sturges* is characteristic:

> It was of course the view of the judges that they were affecting the working of the economic system—and in a desirable direction. . . . [But] it would be desirable to preserve the areas (Wimpole Street or the moor) for residential or professional use (by giving non-industrial users the right to stop the noise, vibration, smoke, etc., by injunction) *only if* the value of the additional residential facilities obtained was greater than the value of the cakes or iron lost. But of this the judges seem to have been unaware.[24] (Emphasis supplied.)

Whether confectioner's private cost for moving his machinery exceeded the collective costs of the externality to the neighborhood, doctor, and health of his patients is necessarily speculative. As for the

24. Coase, *supra* note 1, at 11.

long run, if "the problem of social cost" is basically that of opportunity costs, then short run policies for maximizing the value of production must be evaluated in the same manner.

SOME LIMITS OF ALLOCATIVE EFFICIENCY: POWER, WEALTH, AND NON-NEUTRAL RULES

The exercise of legal and economic power may be expected to have differential effects upon the dynamics of resource allocation, wealth distribution, locational clustering, and socio-economic behavior. "Power" here denotes capacity to define and shift the cost of an activity relative to a revealed configuration of legal, neighborhood, and societal norms. An emitter's externality not only spreads his costs but destabilizes legal, neighborhood, and societal interests. In addition, a competitively organized firm behaving as a locational monopolist induces secondary effects which destabilize prior equilibrium organizations of industry, investment, and consumption. Common law policies avoided social "cost" by protecting property and neighborhood boundaries through a process revealing historic preferences, *ceteris paribus*, for more rather than less stability in socio-economic behavior.

Imagine that the diagram in Figure 1 sets the stage for a potentially euphoric world for two individuals (or firms), E and R. E and R have identical budget spaces—E's is located in the lower lefthand corner

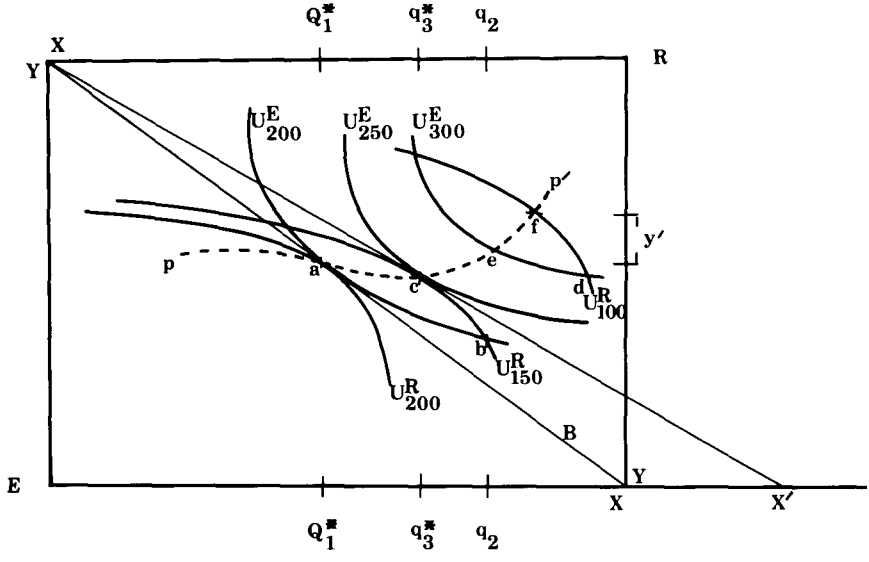

Figure 1

and R's is in the upper righthand. Each has reached identical equilibrium consumption patterns for a good X because all potential gains from trade between E and R (and others) have been exhausted; accordingly no Pareto relevant opportunity costs exist. Moreover, they consume X so as to avoid generating any legally relevant externalities, *i.e.*, creating any emissions which would exceed the neighborhood ambient norm. Thus, their initial wealth, consumption, and use of X are organized so as to be economically efficient, legally inactionable, and more generally stable.

Some supporting assumptions should be expressly stated. The diagram is not an Edgeworth box but rather a representation of their common budget space in which R's wealth endowment is rotated to the upper righthand corner. A common budget line B is formed and diagonally traverses the diagram. Point a describes the individual and common welfare maximizing equilibria by the tangency of their respective indifference curves, U^{E}_{200} and U^{R}_{200}. Q^{*}_{1} denotes their respective consumption patterns for the good X. The general exchange economy—with zero transaction, information, and rationality costs—has been simplified into two goods, X and Y, where Y as the numeraire represents all other goods, *i.e.*, Hicks-Marshall "money". The X axis is defined as units of use of a good which has a non-separable, potentially legally relevant externality. Such a good (a joint product) might be units of use of their respective sewage disposal systems. Each party may use his system up to Q^{*}_{1} capacity without generating an externality spilling over their common legal-economic boundary line. Each additional unit of use of X is assumed, however, to induce an equivalent unit of disuse for the other party. Thus, a five unit "overload" to E's system would result in a spillover of sewage and five units of disuse to R. E and R then may be understood as socio-economic twins whose economic, legal, and neighborhood interests are in full Pareto equilibrium.

The relationship of power to the organization of wealth and resources may be simply illustrated by using the diagram to reconsider some problems of locational monopoly from a common law perspective. A locational monopolist is an individual or firm deliberately or negligently capable of regulating the use of a good in the possession of another party in an extra-market or extra-legal manner. Here, the capacity of one party to induce an extra-market event such as a nuisance externality would disturb the prior organization of consumption and use of X, the relative price of X to Y, and individual budget constraints. For example, E could experience increased use of X with no loss to his equilibrium utility U^{R}_{200} by one

of three methods: changing his utility hypersurface to produce new indifference curves; receiving more money (Y) from the marketplace; or breaching the institutional "rules of the game" and economic freedom premises of perfect competition. The institutional and freedom problems are considered here with particular reference to preserving the strict autonomy of economic units and the determination of prices by free, formal, and impersonal markets. Thus, Coase's theoretical proposition necessarily assumes zero transaction, information, and rationality costs *plus* zero bilateral power costs, *i.e.*, strict avoidance of extra-market power exchanges.

Suppose subsequent to the initial equilibrium a prospective extra-market event is represented as point b in Figure 1. Its "cause" could be E's conscious or negligent use of X in a manner legally relevant to R's consumption. The prospective effect would be to expand E's consumption of X from Q_1^* to q_2, diminishing R's consumption by an exact equivalent, but leaving E no worse in terms of his indifference curve U^E_{200}. Maintaining strict assumptions for zero information costs *before* and after a perturbation,[25] point b is not Pareto efficient for E or R and prospectively avoidable. R especially would suffer loss of utilities for being involuntarily shifted from a higher U^R_{200} to a lower U^R_{150} indifference curve. E potentially might augment his utilities if able to move to a higher indifference curve U^E_{250}.

A market solution of the type proposed by Coase would yield theoretical indeterminacy in allocating bilateral resources. Points a and c describe the limits of indeterminacy lying along the Pareto contract curve p—p'. That curve can be reached by R and E bargaining at the margin and substituting Y for X according to their utility functions. Given the prospective fact represented by point b, *i.e.*, E's capacity to modify his behavior and land use, R's utility position at U^R_{150} can be made no worse off. That fact plus a potential Pareto gain for E and his capacity to threaten further "takings" of X induce a solution at or near point c and a reallocation of E and R resources from Q_1^* to q_3^*. Hereafter this type of solution will be referred to as emitter dominant. Alternatively, suppose a full laibility law (L) were introduced at some time after the initial equilibrium and known to both parties. Such a law would make emitters liable for

25. Coase's assumptions as to the cost of information before and after occurrence of an externality and a somewhat similar equivalent variation analysis are set out by d'Arge and Schulze in an unpublished paper. d'Arge and Schulze, The Coase Proposition, Wealth Effects, and Long Run Equilibrium, (Program in Environmental Economics Working Paper No. 19, U. of Cal. at Riverside, 1972).

money damages suffered by ordinary receptors but explicitly prohibit overcompensation of nuisance victims, *i.e.*, allowing them to profit from the legal process. A prospective externality such as point b either would not be allowed to occur or if it did, it would be quickly remedied. For example, E would be foolish to undermaintain his sewage knowing that he had to compensate E for all prospective disutilities incurred by falling from U^{R}_{200} to U^{R}_{150}. Whatever benefits he might receive from increasing his use of X from $Q_{\dagger}^{*}$ to q_2 would be strictly offset in costs to R. Thus E would deviate from the initial equilibrium allocation only if his net gain in utility exceeded R's corresponding loss.

Next suppose a second case where a prospective externality represented by point d would disturb the prior equilibrium and also enlarge E's satisfaction. An emitter dominant solution would tend toward point f but even if E did not bargain strategically the status quo ante could not be restored. Moreover the original $Q_{\dagger}^{*}$ equilibrium could be preserved only if L law stipulated compensation for total costs to R and refused to marginally "balance" the economic equities of receptors against emitters.

The analytical approach implicit thus far controverts the usual formulation of Coase's proposition: if free and costless bargaining exists, resources will be identically allocated under L or NL but with different wealth distributions. An alternative set of assumptions was developed: wealth maximization creates differential incentives for allocating resources and any solution will tend to be Pareto efficient under any set of rules if bargaining is free and costless.[26]

Since the analysis pertains equally well if E and R are two firms with fixed capital constraints, the following policy propositions for consumers and firms for the short run are drawn:

(1) L and NL are not allocatively "neutral" even for the short run. By compensating for total receptor costs exceeding the neighborhood standard, L law is essentially self-correcting, *i.e.*, the initial $Q_{\dagger}^{*}$ welfare maximizing general equilibrium is maintained against potential introduction of legally relevant externalities. Given perfect information E would discover no incentive for deviating from $Q_{\dagger}^{*}$ unless his prospective net benefits exceeded R's damages. In that case all relevant costs would be internalized, and legal, economic, and neighborhood boundaries maintained.

Conversely, NL law does not ensure, if at all, a $Q_{\dagger}^{*}$ solution coincident with L, and accordingly cannot confirm Coase's proposition for *both* consumers and producers. Instead it appears to authorize

26. *See, e.g.*, Buchanan, *The Relevance of Pareto Optimality*, 6 J. Conflict Res. 341 (1962).

marginalist solutions, to disturb the partial and general equilibrium, and to expand E's use of the joint good. The relative price of X falls with an expansion of E's budget constraint (*e.g.*, from X to X′ in Figure 1) and real income while R's budget space suffers an equivalent contraction and relative price increase of X. Accordingly, bilateral demand and consumption patterns are inversely related and may be further accentuated by an elastic demand function for E implied, for example, by a negatively sloping Pareto curve between points a–c.

(2) Non-neutral resource allocations can be shown to result in the short run for consumers *and* firms by analyzing the equivalent variations amongst emitters and receptors.[27] What E gains in Y money (y′) or X by a change from L (point a) to NL (points e–f) solutions is equivalent to R's corresponding loss in Y or X. What R gains in Y money (y′) and X in moving from NL to L, E loses equivalently.

TOWARD A MORE GENERAL AND STABLE INTEGRATION[28]

A. *A Proposition*

As a general proposition systems of rules and exchange which organize human behavior, regardless of whether it is economic, social, or legal, tend to be relatively stable in the long run because of their structural capability for controlling and correcting most disturbances.[29] That does not preclude, however, Pareto analysis of alternative policies such as L and NL liability rules for the comparative dynamics of the corrective process, *i.e.*, the relative efficiency of alternate rules

27. Mishan establishes allocative non-neutrality by a compensating variation analysis of consumer surpluses. *See*, Mishan, *The Postwar Literature on Externalities: An Interperative Essay*, 9 J. Econ. Literature 1 (1971); and, *Pareto Optimality and the Law*, 19 Oxford Econ. Papers 255 (1967).

28. The economic, legal, and social synthesis proposed in this section has been abbreviated due to severe space limitations.

29. This statement should be expanded for readers not familiar with equilibrium analysis. A concise overview is provided by Parsons and Smelser.

> Both economic theory and the general theory of social interaction, like many other scientific theories, make important use of the concept of equilibrium or stable state. The first meaning of "process" has a given equilibrium state as a point of reference. The processes are those series of events by which such a state is maintained by interchanging inputs and outputs both over its boundaries and between units or sub-systems which constitute the system in question. The rates of inputs and outputs are not assumed to be constant; indeed the "dynamics" at this level of theoretical analysis consist precisely of the effects of changes in these rates. But on this level such changes are in general relatively small in magnitude and short in duration. The "equilibrium" conception is that such relatively small changes tend to be "counteracted" by the effects of their repercussions on other parts of the system, in such a way that the original state tends to be restored.

Parsons & Smelser, Economy and Society, 247 (1969).

for allocating resources with no net loss in social welfare. A more precise statement regarding Coase's proposition may be made in the language of economics: Given a perfectly competitive economy in optimal equilibrium organization with no external diseconomies, and provided income distribution and resource allocation are analytically integrated,[30] a NL (market solution) rule is not unambiguously Pareto optimum while a L (legal solution) rule is because it precludes any further reorganization of wealth and resources—unless *total* net benefits exceed *total* social costs. Benefits and costs then necessarily reference to the socio-economic organization implied by the initial equilibrium state. That state is characterized economically by a single universal price for each unit of factor inputs, outputs, and labor,[31] and is determined by free and formal markets.

The Problem of Process. Figure 2 describes two ways by which an economic system might typically respond to introduction of an externality. Let the horizontal line describe the initial equilibrium price (or output) of E (or R); a legally relevant externality is introduced at point t_0 in time and resulting price (or output) effects are plotted against the horizontal axis.

Next suppose a set of assumptions favorable to Coase's proposition: that E and R are in separate industires in long run equilibrium; that

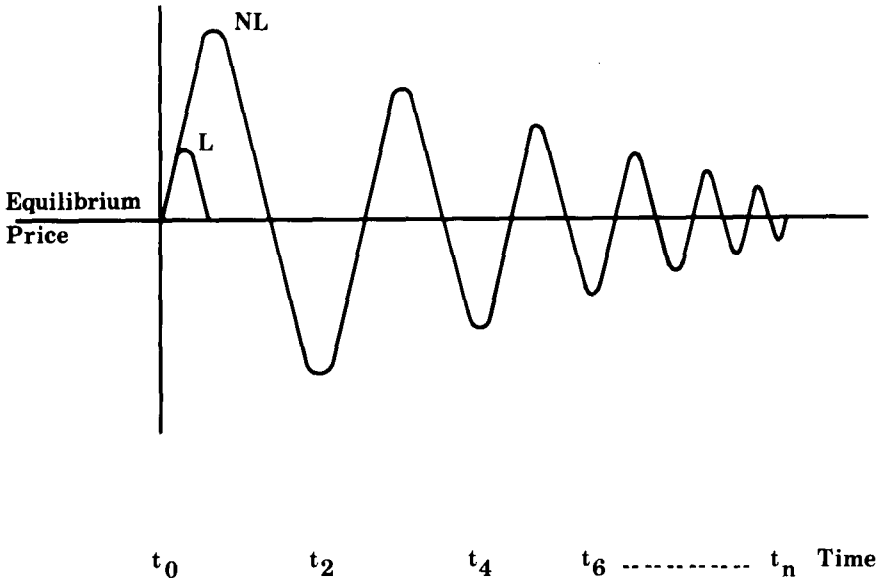

Figure 2

30. Mishan, The Costs of Economic Growth, 45-56 (1967).
31. *Id.* at 47.

their products are substitutes; that consumer demand and prices in all other sectors are held constant from t_0 to t_n; that any price (or output) changes in E and R eventually stabilize; and that bilateral monopolies are reversible. The last two assumptions are particularly significant. It is assumed that any price (or output) fluctuations will result in a convergence pattern by operation of the cobweb theorem, *i.e.*, the initial price (or output) is reestablished because the slope of demand and supply curves for each industry preclude explosive market reactions.[32] Also, it is assumed that E's behavior as a locational or bilateral monopolist under NL rules is reversible without government intervention. E's power to solicit a bribe from R under a market solution constitutes formation of an unconventional (bilateral) monopoly in which E is able to manipulate the "supply" of R's property rights and neighborhood amenities.[33]

Thus, if it is assumed *arguendo* that L and NL would yield identical long run equilibrium prices (or outputs) for E and R, the problem of process is inescapable. In Figure 2 the line L indicates that a legal solution would be self-correcting and maintaining the initial equilibrium in all cases where total social costs exceed total private benefits of an externality. The NL line describes operation of the cobweb theorem in which price (or output) fluctuations for E (or R) are plotted against the initial equilibrium level as market clearing occurs over time. These fluctuations may be explained simply in the following manner. R's payment of a bribe to E not to pollute creates an economic rent in which R foregoes some of his equilibrium producer surplus and transfers it to E. E thus "earns" a positive economic profit (*e.g.*, marginal revenue now exceeds marginal cost) while R incurs a negative profit. Output in E's industry expands as old and new firms (assuming free entry and exit) respond to E's profit signal and increasingly seek to market a joint product, *i.e.*, act as bilateral monopolists and threaten to introduce nuisance externalities. A new supply curve emerges for E's industry and price begins to fall while the converse occurs in R's industry. Price (or output) movements for E and R seek a new long run equilibrium and are described by the cobweb theorem; these movements may be moderated by assumptions of consumer substitution of the outputs of E for R according to their relative price ratios.

Of course, in the real world price and output fluctuations could

32. *See, e.g.*, Schneider, Pricing and Equilibrium, 250-271 (1962); Fossati, The Theory of General Static Equilibrium, 197-204 (1957). Similar convergence assumptions apparently are made by Demsetz and Calabresi. Demsetz, *When Does the Rule of Liability Matter?*, 1 J. Legal Studies 13 (1972); Calabresi, *Transaction Costs, Resource Allocation and Liability Rules—A Comment*, 11 J. Law & Econ. 67 (1968). *But see* d'Arge and Schulze, *supra* note 25.

33. For one view of the problem of locational monopolies, *see Demsetz, supra* note 32.

substantially destabilize and render uncertain the prior organization of wealth, employment, income, and investment. And on a theoretical level, if Coase's proposition is to be evaluated on its own premises, more stability is preferable to less stability *certeris paribus.* A L (legal) solution appears more dynamically efficient even under very favorable assumptions for Coase's argument. That L and NL would have different stability properties is not surprising if intuitive societal prohibitions against theft, coercion, and taking of property are considered. Little boys, for example, are not allowed to blackmail shopkeepers by threatening to break their store windows unless appropriately bribed, in order to protect the stability of more general individual, neighborhood, and societal interests.

The Problem of Starting Points. Problems of social and opportunity cost analytically can become either muddled by assertions as to "the reciprocal nature of the problem" or clarified by reference to a set of economic, social and legal starting points. Coase's proposition can be tested theoretically only against explicit assumptions for short and long run perfect competition. But there is a related economic problem in the marginal cost pricing of externalities. The difference between legally relevant and Pareto relevant externalities is that the former compensates for total costs while the latter marginally internalizes, marginally regulates formation of bilateral monopolies, and marginally reorganizes wealth and resources.

The real world advantages of marginal or total[34] cost pricing of nuisance externalities, however, cannot exclude extra-economic considerations. The legal viewpoint regarding protection of societal entitlements by property, liability, or inalienability rules was well stated by Calabresi and Melamed:

> We either are entitled to have silence or entitled to make noise in a given set of circumstances. We either have the right to our own property or body or the right to share others' property or bodies. We may buy or sell ourselves into the opposite position, *but we must start somewhere.*[35] (Emphasis supplied.)

Identifying the appropriate social starting point and its relationship with the internal logic of economic and legal policies is even more uncertain, but that increasingly is no excuse. If environmental policies are to preserve and stabilize certain community and societal values in

34. We do not intend here to review or enlarge the economic literature on marginal cost pricing of externalities except to note that it is not accepted legally as the measure of money damages. A legal solution favoring total cost compensation for nuisance damages exceeding the neighborhood standard probably would not be well received by many economists. *But see* Mishan, *supra* note 27, at 14-15.

35. Calabresi & Melamed, *Property Rules, Liability Rules and Inalienability: One View of the Cathedral,* 85 Harv. L. Rev. 1089, 1100-1101 (1972).

addition to regulating externalities, a functional reconsideration of the English common law would be in order. Some of Mishan's more general observations are especially pertinent.

> A strong sense of community is not a synthetic product to be created *ab initio* by skilful plugging at common interests. The sense of community requires the fact of community, an environment of direct human interdependence. . . . In the older forms of social organization which began to disappear in the early nineteenth century it was just this inescapable fact of close interdependence that held the family and community together. . . . Narrow though their lives might appear by our megalopolitan standards they had, rich and poor, young and old, their place in the natural order of things, a settled relationship to one another guided by a network of custom and mutual obligation.[36]

Nonetheless, the fundamental issue of Coase's proposition resides not in questions of allocative neutrality, zero information and transaction costs, or marginal versus total cost pricing, but in the problem of what is a "cost." That in turn implies the exercise of power to define the incidence and distribution of costs and ultimately to influence the structural organization of socio-economic behavior.

36. Mishan, *supra* note 30, at 165.