The Illusion of Effluent Charges, or Regulatory Dilution is No Solution to Pollution*

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* A Critical Essay Prompted by a Reading of Frederick Anderson, Allen Kneese, Phillip Reed, Serge Taylor, and Russell Stevenson, *Environmental Improvement through Economic Incentives*. Baltimore: Johns Hopkins Press for Resources for the Future, 1977.

The idea of effluent charges as a strategy for environmental management has been circulating in various forms for almost two decades. It has become part of the litany of environmental economics, appearing with predictable regularity in academic literature on pollution regulation. Thanks to the editors of this journal, who have asked me to review the book *Environmental Improvement Through Economic Incentives*, by Anderson *et. al.*, I am provided with a long-awaited opportunity to address the fallacies of effluent charges. In the process I hope to puncture some of the serene illusions of the proponents of charges and redirect attention amongst academics concerned with environmental regulation toward the substantive problems of pollution control in the capitalist nexus of the advanced industrial economies. I intend this as an essay in provocation, based on my experience with the environmental protection movement in the United States.

It would be a mistake to consider *Environmental Improvement Through Economic Incentives* as just another essay on environmental management. It rests firmly on the shoulders of a whole school of thought that has been developed by Allen Kneese and his colleagues at Resources for the Future (RfF) over two decades. A group of RfF staff began the present book in 1970, and it circulated for many years in draft form with some recognizable impact on administrative and Congressional policy declarations. It was eventually revised and published by a somewhat altered set of authors, including Kneese, under the leadership of Fred Anderson.

This book contains the most circumspect presentation of the effluent charge idea yet. The attention which the RfF team give to base studies, legal arguments, monitoring and political matters was an effort to answer the critics of effluent charges. In particular they wish to show that effluent charges are not only theoretically more efficient but also *practically* more effective as a mode of regulation than current methods. Most of their book is devoted to the latter task. In venturing from the realm of economic theory to that of political strategy, however, the authors have opened themselves up to more criticism than they have answered. They remain fundamentally incapable of answering — or even speaking to — the most difficult problems facing those who would control the level of industrial pollution. And this failure derives from the basic assumptions they make about economy, polity and society.

The RfF team believes, in keeping with their neoclassical economic roots, that resources are scarce and consumers are sovereign. Because pollution control is costly, regulation should be as efficient as possible, in the sense of minimizing the costs of reaching a given level of environmental quality. Otherwise many people--perhaps a majority--will feel that a clean environment is not worth it--i.e., they will trade off more goods and services against environmental quality. In this neoclassical world no capitalists or accumulation process intervene actively between natural endowments and final consumption. The RfF group also believe, in keeping with their liberal political beliefs, that the society around them is generally egalitarian, pluralistic and progressive. Hence while there may be differences of "interest" among various groups over pollution control, the country is by and large committed to improved environmental quality. Unfortunately, the distorted incentive system of conventional regulation tends to discourage the industrial sector from complying. In the liberal world there is no class power of business and no inherent reason why industry should not be willing or able to meet environmental goals. To these reformers the problem is to reshape the method of regulation so as to reduce the costs of cleaning up the environment and to give industry a real incentive to comply with regulatory standards. This project, it should be added, does not pose any special problems of information and science. The authors also believe, after the fashion of contemporary positivism and faith in objective technical knowledge, that the costs, means and goals of pollution control are not themselves political questions subject to economic pressures.

From my own experience in trying to assess the success and failure of environmental regulations in the United States over the last decade I have come to the conclusion that the problem lies not with the mode of regulation, which the effluent charge advocates seek to improve, but with the mode of production, which neither they nor the defenders of conventional regulation ever adequately address. My understanding of the failure of pollution control regulation is that: (1) it runs up against the determined opposition of a powerful class of industrialists with a variety of tactics of obstruction at their command;

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(2) it is helpless before economic forces government does not control, such as basic production and investment decisions[5] or aggregate swings in national output and employment; and (3) it demands difficult decisions based on imperfect scientific knowledge and social assessment of risks that come laden in this society with power relations, economic valuations and a technocratic ideology reflective of the capitalist order in America. One should add that government in general is shot through with the dominant social relations of American society and does not enter the scene of regulation innocent and ready to serve the "public interest" impartially. In other words, effluent charges constitute a form of tinkering with the machinery of governance without getting at the underlying mechanisms that produce pollution. They may offer a somewhat better tool of regulation but they do not grant regulators either the political power to impose the goals of environmental protection, the economic means--greater investment and planning controls over private corporations--to achieve those goals, or the scientific knowledge and humanitarian vision to set those goals wisely. Certainly in the era of Reagan, we should be more attuned to the political nature of the regulatory problem and, indeed, of the political significance of putative calls for greater "efficiency" in government.

I will now treat the shortcomings of the effluent charge argument, as presented by Anderson *et. al.*, in some detail under four headings: (1) the basic theoretical arguments for effluent charges; (2) standard setting and the information base; (3) compliance and enforcement; and (4) economic dislocation.

1. THE BASIC ARGUMENTS FOR EFFLUENT CHARGES

1 a. Economics

The basic economic rationale for effluent charges is probably already known to the reader. Anderson *et. al.* have been kind enough to keep the economic theorizing to a bare minimum. I will follow their lead.

The base for charges is predicated on the neoclassical affection for markets and market-like paths to economic efficiency. The first assumption is that business firms are rational, cost-minimizing organizations operating to make profits under competitive conditions. The argument proceeds, sensibly enough, to say that where production generates waste materials that are costly to reduce or dispose of, the typical business firm will try to dump those wastes free of charge into the air, water and land. These environmental media have effectively been free resources, available to anyone. By exploiting these so-called "common property resources," industry has been able to externalize its pollution control costs onto society at large. The argument is similar for consumer wastes but I will speak solely of the industrial pollution problem here, since this is the chief target of effluent charges.

The neoclassical answer to industrial pollution is that industry be forced to internalize its externalities and bear the costs of cleaning up its discharges to a level consistent with social environmental goals. The pure neoclassical solution would be to vest the public with property rights in the commons so that all externalities come within the scope of market transactions between private parties. This would achieve a socially optimal level and distribution of pollution. But most environmental economists, who generally do not share Milton Friedman's extreme views on privatizing everything from national parks to school systems, understand that a pure market solution is not possible. The transaction costs of bringing together many parties and the fungibility of pollutants in natural systems are two good reasons why one must call on the coercive power of the state to regulate polluting activities.

But neoclassical economists worth their salt can never rest content if their beloved market mechanism is excluded. They therefore argue that a quasi-market solution can be rescued if the state adopts an effluent charge strategy of regulation. That is, the state sets overall ambient media quality standards, then establishes a price for discharging pollutants such that the sum of all effluents does not exceed ambient standards. As our authors put it:

> In theory there exists a price on environmentally harmful behavior that will result in attainment of any given ambient quality standard....Charges on the dumping of any kind of waste into the environment will cause rational cost-minimizing individual sources to reduce their discharges to the point at which the cost of the next incremental unit of discharge reduction equals the charge. To the extent that control costs vary from source to source, the level of control will vary from source to source. However, if the correct charge is imposed, the cumulative effect of these individual cost-minimizing decisions will be a reduction in total discharges sufficient to achieve the desired ambient level of air or water quality. (32)

The authors admit that theirs is not an optimizing, merely a cost-minimizing, strategy.

All this is still quite sensible, given the problem as stated. After all, it is hardly more than common sense. But it does not go far enough. The neoclassical understanding of pollution, centered on the disposal of waste byproducts and market failures due to lack of clear property rights, is an inadequate conception of both the nature of environmental hazards and their origin in the logic of capitalist production.

First, it is often not the byproducts but the *products themselves* that are hazardous, for example, paint-strippers or home-use insecticides. The pollution hazard arises in the *normal* course of use, even if handled properly, and often directly threatens the user. Even if the hazard is a byproduct of use, the burden of pollution control is shifted to the consumer (whether a householder or another firm), who generally has less knowledge and competence to deal with it than the producer.

Second, hazards still exist that are "confined" com-

pletely to the direct property of the producer or user, as in the case of applications of pesticides on farms or on-site dumping of toxic chemicals. Additional pollution problems may arise if the material moves over, under, or on the ground to another's property. The hazard arises because people move in and out of industrial property all the time, or the property is transferred at a later time (*e.g.*, the Love Canal). The problem here is the freedom to do what one wants with one's *own* property, when property lines are a fiction in a continuous social and physical world.

Third, many of the gravest effects of pollutants are visited on workers, who necessarily come onto industrial premises and who are, during the work day, a kind of "property" themselves. Only by rather circuitous logic can one think of health damage to a worker as an "externality." It is part and parcel of the production process and the exploitation of labor. One should not be surprised when companies that regard laborers principally as instruments for the production of surplus value (profits) treat them as they would machines—and unruly ones at that—to be used, abused, and discarded as profitability dictates. Nor does the evidence sustain a view that workers are compensated for hazardous work by higher pay. On the contrary, labor market segmentation assures that many of the dirtiest jobs are also the worst paid.

Fourth, even the foisting of pollution costs onto outside property owners and citizens—the conventional externalities case—is not due to a breakdown in property relations and the market so much as it is a *normal* power relation, consistent with the unequal social order of capitalism. The failure of the market is not a technical but a social one.

The same underlying problem is present in all the above cases—hazardous products, worker safety, abuse of one's own property, and externalities proper. Those who suffer unnecessarily from pollution must bear it precisely because they lack the power (including knowledge) to stop the damaging action of industry. *In other words, property rights cannot be corrected to solve the problem of pollution because property rights—the control of the means of production by a small class of people—are themselves the problem.*

Fifth, many of the pollution hazards presented by modern industry, whether products or byproducts, worker threatening or community threatening, derive not from a static process of cost-minimization, but from a dynamic process of technological innovation in products and processes. That is, the origin of the hazard lies chiefly in the race to stay ahead of one's competitors by growing in output, sales, assets and productivity. This may seem a mere quibble or change of emphasis, but it points to a fundamental contradiction of capitalism. The system is noted for its ability to generate technological innovation, thanks to the spur of competitive profit-seeking. But that same restless drive to innovate also feverishly forces technique ahead of the social understanding of its effects and social means of controlling it. This is the crux of the whole dispute over nuclear power, for example. The technology is inherently very dangerous, given the properties of nuclear materials and their implications for human health, and while we may someday be able to handle them with reasonable safety, one has little faith in organizations such as Metropolitan Edison Corporation to do so at present. Yet electric utilities ill-advisedly seized upon nuclear power as the next great technology of power generation and invested heavily in it. This was not only unwise environmentally but a gross economic blunder as well, since the plants operate so poorly (with or without the effects of popular opposition). The theory of externalities has little to say about this sort of dilemma of technical non-progress.

Sixth, additional pressures for polluting are created by conditions of poor industry or firm health, business slumps and other normal features of the unplanned capitalist economy. I will return to these issues in more detail in Section 4 below.

In short, neoclassical theory overlooks the three mos. basic problems behind pollution generation in a capitalist economy: (1) property relations rest on and reproduce power relations of class; (2) production is predicated on profit making, not social need, and is subject to the anarchy of competition and aggregate busines fluctuations; and (3) the whole question of imperfect knowledge is regularly begged in neoclassical economies, whether it be consumer information about products, producers' command of technologies, or business's ability to anticipate market conditions.

1 b. Politics

Even if the theory behind effluent charges does not speak to the economic origin of much of our environmental dilemma, charges themselves might nonetheless continue to be defended as a beneficial tool for the more limited task of effective administration of pollution control laws, i.e., as a more flexible, accurate tool of regulatory implementation.

Charges are held to be more efficient than direct regulation because regulators do not try to force a uniform straightjacket of effluent or technology standards on industries with different characteristics; instead the industrialists are free to find their own optimal level of clean-up and technical path to that end. That is, effluent charges are a form of "performance" standard. Charges are the best way of implementing such standards, it is argued, because the costs of pollution control are "so staggering" that the economy cannot bear the weight of achieving environmental quality goals in an inefficient manner. Anderson *et al.* go even further in their claims for the practical virtues of the effluent charges tool. Charges are held to be not only the most cost-effective form of control, but the most administratively effective and equitable as well. Conventional regulation fails, they argue, for three reasons: (1) it lacks the information necessary to establish effluent and technology standards that will stand up politically and judicially because the regulatory agency staff must become better experts than the managers of the industries they survey; (2) industry has an incentive to avoid compliance because enforcement is selective – consisting of court injunctions and fines against target violators – and can be challenged in the courts and delayed interminably; (3)

enforcement must be on an all-or-nothing basis, such as court injunctions or one-time fines, that often threaten weak industries or local employment and are therefore politically unpopular. (12-15, 148, 157-58, 185-86)

The above description of the proximate barriers to successful regulation is, again, close to the mark as far as it goes. Agencies are constantly in the position of defending technical decisions in the face of poor information about control techniques, discharge levels, environmental effects and economic impacts. Industry regularly finds it more attractive to avoid compliance than to spend money on control efforts, given the low likelihood of vigorous enforcement by overburdened, understaffed, underbudgeted and frequently uncommitted agencies. They also enjoy frequent success in repelling regulators through court appeals. Finally, agencies are exceedingly reluctant to come down hard if there is any threat of economic dislocation, even though targeted companies often grossly exaggerate the potential impact of meeting standards. I have documented this all at length with regard to clean air act enforcement.*

Effluent charges will, according to the authors, solve these problems because: (1) the regulators need only know the levels of discharges, via monitoring, while responsibility for the technical means of compliance is left entirely to the industry in question; (2) enforcement will be much easier because all pollutants will have to pay effluent charges until they clean up their discharges, so that their attention will be focussed on doing the job rather than trying to evade compliance; and (3) charges will be a continuous burden to which industry must respond so that regulators will not be put in the bind of having to close down a factory for noncompliance.

Anderson *et al.* are so enthusiastic as to hold out the charge system as "potentially an administrative automaton, with relatively little vulnerability to administrative ineffectiveness and corruption." (186) It would have the additional merit, if the bull were taken by the horns, of shifting responsibility for standards and charges away from hidden, lengthy administrative proceedings to the relatively public and immediate deliberations of Congress. (186)

But do effluent charges really offer a panacea for the ailments of contemporary regulation? My reading of the regulatory experience of the last decade indicates that they will confront the same problems of imperfect knowledge, political weakness, and lack of economic planning as conventional regulations, though perhaps in somewhat different guides. The "administrative automaton" of effluent charges is therefore a grand illusion on the order of Adam Smith's "hidden hand" of the market.

2. STANDARD SETTING AND THE INFORMATION BASE

Proponents argue that the need for information and technical expertise will be reduced under a charges system of regulation. All that will be required is to monitor effluents and assess appropriate charges. But this begs all the difficult issues and ignores a number of hard-learned practical lessons about regulation.

Although it may appear that a charges system allows one to avoid the difficulties of standard setting, this is by no means the case. Ambient standards will still have to be established, based on an assessment of the health and ecological damages caused by various pollutants and the levels of harm that people are willing to tolerate. To meet ambient standards, regulators must identify the sources of each type of targeted pollutant . They will then have to assess the contribution of a unit of discharge to ambient pollution levels, allowing for intervening natural processes. Finally, they must determine a proper charge per unit of each kind of effluent that will reduce discharges enough, in sum, to reach desired ambient levels. This complex process raises a host of difficulties.

First, the level at which ambient standards are set – probably the most volatile political question in environmental regulation – must still be determined. The battles over exposure limits in the last decade are legend, with workers and environmentalists facing off against industry. Given that the scientific basis for hazard assessment is both theoretically and empirically in dispute and that the evaluation of tolerable risk is inherently political, there is no prospect of standard setting becoming an "automatic" process.

Second, in order to assess the net impact of discharges on ambient media quality, one must have models of intervening natural processes. For example, how much does a ton of sulfur dioxide in Chicago add to the acidity of rain in Maine and how much will it affect lake ecology there? Because such models are notoriously imperfect, exclusive reliance on ambient media standards will be a step backward in regulatory practice. Congress moved to point source and technical standards to escape this bind in the early 1970s. Ambient process models are rarely defensible in court when industries charge that their particular ton of grime is not as guilty as the regulators say. Anderson and company are blissfully unaware of this bit of regulatory history.

Third, regulators will have to set charges at just the right level to reduce total emissions by the desired amount. One way to do this is through an interactive process of educated guesses. It has two disadvantages: uncertainty – the bane of industry and effluent charge advocates alike – will be considerable until final charge levels are reached, and the interactions, based as they are on guesswork, will be difficult to defend in court. Industry will find these useful openings to attack regulation. A more defensible alternative mode of charge setting would be to have a good idea of the cost structure of industrial polluters so that a reasonably effective charge can be set the first time. This strategy, however, demands exactly the kind of detailed information about the operations of

*See R. Walker and M. Storper, Erosion of the Clean Air Act of 1970: A Study in the Failure of Government Regulation and Planning," *Boston College Environmental Affairs Law Review*, Vol. 7, No. 2, pp. 189-258. See also R. Walker, M. Storper, and E. Widess, "Performance Regulation and Industrial Location: A Case Study," *Environment and Planning A*, Vol. 13, pp. 321-38.

regulated industries that charge proponents are trying to avoid.

The setting of proper charges also involves technology assessment. The history of pollution legislation shows that Congress realized in the early 1970s that blanket effluent standards do not sufficiently allow for specific technical differences among industries, nor for varying technological potentials for innovation. This realization prompted the use of technological standards for new sources under the Clean Air Act and all sources under the Clean Water Act, especially the technology-forcing provisions of the 1983 "best available technology" standards. An effluent charge scheme will face the same problem of assessing technological potential, e.g., what will it really cost to lower hydrocarbon emissions from paint factories in ten years? It will also encounter the same complaints (and law suits) by industry claiming unfair treatment because, for example, a blanket charge on acid discharges does not allow for the lack of technical alternatives in the steel industry.

Furthermore, it is by no means clear that technological standards are being administered in a heavy-handed way; they are, in fact, subject to considerable adaption in practice. Anderson and company have created a straw man; the ignorant, inflexible bureaucrat pushing his or her nose into a company's business. The RfF group seem quite oblivious to the purely political impact that stringent technology-forcing standards, such as those under the Clean Water Act, were meant to have. It is doubtful that anyone in Congress took literally the goal of "zero discharges" by 1985. But they did take seriously the need to make a political statement that regulation was going to be as tough as possible and that industry had better get moving to find ways of reducing its pollutants; otherwise, it would have the government breathing down its neck with independent assessments of what was technologically possible. Moreover, according to John Quarles, former Acting Administrator of the Environmental Protection Agency, EPA does not mandate technologies, except those minimally adequate to make progress toward meeting pollution control goals. Industry is free to come up with better alternatives, just as in the effluent charge scheme, and thereby keep their costs of compliance down.

Finally, the argument for effluent charges includes an assumption that the hazards of pollution are not serious enough to raise any question of social justice if companies are allowed to "buy the right to pollute," i.e., pay the effluent charge instead of lowering discharges to the lowest reasonable level. Advocates of charges dismiss objections to this as mere romanticism. Environmentalists, they say, are ignorant of the hard economic facts concerning the costs of pollution control and the need to minimize these by allowing industry flexibility through charges. But environmentalists have perfectly hard arguments on their side, too. They believe that health and ecological damage from pollution is so great that: (1) polluting is effectively a crime deserving of as complete a prohibition as possible. One cannot buy one's way out of a criminal charge in the same way as one may settle a civil suit by out-of-court payment; (2) high discharge by some polluters who would rather pay than clean up puts certain subpopulations of workers and local communities at excessive risk; and (3) a wealthy society can tolerate the higher costs of a more "inefficient" form of regulation– one that seeks to minimize all sources of pollution at the same time as reaching a general ambient target level. None of these counter-arguments, by the way, requires one to defend the absurd position, used as a red herring by economists and industrialists, that a point of zero discharges must or can be reached. (There are, of course, real economic problems caused by pollution control in certain situations. These are discussed in detail in Section 4, below.)

The advocates of effluent charges are themselves divided on the question of economic efficiency versus social justice when it comes to such highly toxic materials as asbestos. True believers have no qualms about pursuing the full logic of effluent charges in such cases. They assert that the risks of exposure to extremely hazardous substances can be balanced against the costs of cleaning up industry. By adopting this disembodied calculus of human gain and loss, however, they no longer may simply be considered neutral or well-meaning proponents of economic efficiency. For no such calculus can or will ever exist. Benefit-cost is not a cake-mix on the shelf and ready for use. In the present political context of intense struggle over whether any avoidable exposure to certain substances should be tolerated, the hardliners are necessarily taking a political position – one that falls squarely in the camp of industry.

Nor can the application of effluent charges to highly toxic discharges be considered a very practical suggestion. The idea, necessary to the charges scheme, that ambient pollution be considered separately from individual sources of toxic substances is a bit far-fetched. One has to set very specific effluent standards, based on a close knowledge of technology for various companies using or manufacturing specific hazardous substances. Moreover, it is often physically impossible to separate bulk and trace pollutants. For example, gasoline vapor, a major source of "hydrocarbons," is also laden with such hazardous materials as lead, ethylene dibromide and benzene.

To their credit, Anderson *et al.* balk at taking their principles to the limit. They exempt extremely hazardous materials from the charges scheme on the grounds that the dangers to life are simply too great (17, 88). But such wavering on principles seriously compromises the whole campaign to get effluent charges adopted. Public concern has been moving away from the initial focus on bulk pollutants, such as phosphates, toward the recognition that trace amounts of highly toxic chemicals and radiation are the gravest health and environmental threats of our age. If effluent charges cannot help us in this critical area of concern, one may wonder what all the fuss is about.

3. COMPLIANCE AND ENFORCEMENT

Far from being a "regulatory automaton," a system of effluent charges raises as many questions as it answers. This criticism continues to apply as one moves from standard setting to enforcement. How do regulators assure

that firms either clean up their wastes or pay their effluent charge? Effluent charges will be no easier to enforce than direct regulation.

Anderson *et. al.* begin: "The real basis of comparison [between effluent charges and direct regulation] must take into consideration the probability of having to comply." (158) They then blithely assert that "under a charge system, a firm is almost certain to have to pay the charge or spend money to abate in order to reduce its charge payment." (158) Compliance is seemingly made automatic by the continuous, low-level pressure of charges.

The key on which the case against conventional regulation rests are that firms are willing to take the risk of not being the ones against which enforcement action will be taken and that a single large fine is more onerous than many smaller payments. But these are not the main issues at all. The chief barriers to the successful enforcement of conventional regulations are : (1) industry resistance to cleaning up; (2) insufficient fines to make industry fear enforcement; and (3) lack of funding and political will to confront recalcitrant firms. (In the age of Reagan, moreover, all these conditions have worsened.)

Many industrialists simply feel that pollution control is not an important goal and resent paying any money for either abatement or fines. Industry finds particularly galling any loss of control over its operations due to strong environmental laws that allow substantial worker and citizen input and require government approval of managerial decisions. The chief bone of contention is not costs so much as it is rules (work rules or health protections) that affect company flexibility, managerial autonomy and investment uncertainty in a period of fierce international competition that requires a response via technical, financial and organization restructuring. That is, management does not want to be bound by the need for approval from unions or regulators when it must move rapidly to change work organization, product line, or the location of investment. As I have previously argued, however, effluent charge schemes are likely to require more intervention in the realm of production than their advocates would like to admit, so even this advantage will be diluted.

Furthermore, the maximum fines allowable under most environmental laws (let alone those actually assessed) are embarrassingly low. There is no danger that vigorous enforcement will bankrupt any but the tiniest of firms. Under the circumstances, whether the pittance must be paid all at once or in installments is irrelevant. In other words, industry's main incentive not to comply with pollution regulations is that even if a firm is caught redhanded, no great loss will be incurred. (How effective are three-dollar parking tickets?) The expected loss from being caught is low because fines are low, not, as Anderson *et. al.* assume, because the probability of being caught is low. Most companies that do comply with current regulations do so not from fear of fines, but from fear of adverse publicity, injunctions to stop production, or large civil suits.

If fines were high enough to threaten industry seriously, conventional direct regulation would be relatively "automatic" too. But one must make the fines stick. At this point, direct regulation and effluent charges face exactly the same problem. If firms wish to be recalcitrant, they can simply deny any guilt and refuse to pay. The only recourse for the regulators is to single out noncomplying firms and sue them for non-payment (or, conversely, to defend themselves against suits by firms that feel unjustly penalized). Effluent charges will fare no better than conventional regulations in avoiding such resistance. If standards and penalties are high, so that industry must either pay a lot to clean up or a lot to go on polluting, the likelihood of resistance to effluent charges will be high (especially as the costs of noncompliance approach or exceed the hefty lawyers' fees the companies incur). Moreover, if charges are high enough, one will encounter the same effective cost-benefit arguments that industry now raises against all stringent emission standards.

Not surprisingly, regulatory agencies often lose to industry in court. This has as much to do with inadequate legal staffs, bureaucratic error, genuine scientific doubt, and biased judges as it does with the inherent virtue of the companies' cases against their alleged tormentors. Like as not, the agencies will try to avoid such precedents and attendant waste of staff resources by backing off from confrontations and granting exemptions, delays and other dispensations to industry. Indeed, the weakness generally goes deeper, given the bad publicity and political flak that industry can mobilize against regulators and their electoral overseers. The level of self-censorship within supposedly overbearing agencies, even within administrations that are not as avowedly pro-business as Reagan's, is quite remarkable.

In short, there is nothing automatic about regulation as long as industry does not accept the basic legitimacy and goals of state action. The critical issue is not the type of enforcement tool the agencies adopt, but whether the tool they choose will be backed up politically, judicially, and ideologically. If there is widespread resistance to a charge system because rates are high, monitoring is poor, or for any other reason, it will invariably be challenged. But once effluent charges have to be defended in court or the political arena, they quickly lose any pretense to technical neutrality and automaticity. Anderson *et.al.* even recognize the inevitable politicization of charges, to wit:

> The foregoing analysis of the technical basis for caluculating the charge and the economic stakes involved in the charge decision makes it apparent how 'political' the charge decision is likely to be. It is 'political' not only in the sense that important distributional issues are inevitably affected, but also in the sense that the decision cannot be made only on the basis of scientific facts and methods, but must involve value choices at important points. (177)

The RfF group do not understand, however, that this is not merely a qualification, but the basis for a wholesale rejection of effluent charges as a magical automaton of regulation. If charges are as politically vulnerable as any other form of regulation, then, given their inherently problematic scientific and practical foundation (as argued in the preceding section), they are just as likely as direct regulations to be evaded, weakened or thrown out entirely

under the determined resistance of business. (In line with this point, Anderson *et. al.* miss entirely the significance of one piece of information in their case studies of effluent charge schemes now installed around the world. The one major example of solid waste recycling charges they discuss. an incentive scheme adopted in New York City, was never fully implemented thanks to legal challenges.)

The only way charges will ever be collected on a noncontroversial and hence unchallenged basis is if industry generally accedes to the whole program. For example, the two successful instances of charge schemes in capitalist countries discussed by Anderson *et. al.* –the Ruhr Valley Association and Japan's Workman's Compensation Law (63)–are cases of self-enforcement by industry-run administrative bodies. It may well be that industry will at times agree to such a system and achieve a measure of pollution control on its own. Such "public-spirited" action is, however, normally caused by the threat of more stringent regulation under someone else's control, to avoid widespread public outcry, or, most important, to avoid much larger losses through civil suits by workers, consumers or citizens in general. It is naive to assume that the effluent charge caused industry to adopt these schemes and not the other way round.

Clearly, I cannot accept, as the proponents of effluent charges do, the liberal assumption that industry is merely another "interest group" bearing no basic class antagonism to pollution regulation and concerned only with the excess cost of regulation and the relative ignorance of regulators about production. Unfortunately, the evidence does not support the view that industry agrees to the social goal of a cleaner environment if it mean substantial sacrifice of workplace control, profits, or investment mobility. The recent history of worker safety and health, pollution control, consumer product safety, and kindred social regulations, shows industry fighting meaningful reform tooth and nail. This opposition occasionally reaches such extremes that it goes against the self-interest of business, as in the case of the resistance of Detroit auto-makers to government mandated improvements in their product, such as greater fuel efficiency, that make them better off with respect to more innovative foreign competitors.

The preceding arguments are academic, of course, if in practice effluent charges do not differ substantially from conventional fines or user charges. This appears to be the case. The criticism has been raised against Allen Kneese and others for years that they have tried to make a silk purse out of a sow's ear. The effluent charge schemes they point to are actually nothing more than glorified systems of sewer charges or fines. One must look hard among the cases cited by Anderson and company for any examples of true effluent charges. The famous Ruhr Association, so often trotted out on display, is really no more than a grandiose sewer system, with charges levied to cover the costs of collective treatment at the business end of a local river (not the Ruhr) given over as an industrial cloaca. (Admittedly, it is better to price by pollution loading than by water volume, as is usually done.)

Another example cited by Anderson *et al.* is the Connecticut environmental charges scheme adopted in 1976; indeed, this is the *only* working system of charges other than bottle deposits and ordinary sewage utilities that one can find in the United States. But as Connecticut only levies charges against a select group of noncomplying industries, all we have, as the authors admit, is a modified system of fines for the recalcitrant. Moreover, its chances for success are improved by the threat of even greater civil penalties lying in wait!

The Connecticut scheme is not a bastard case, either; it is very close to how effluent charges must be applied in order to avoid the claim of "double burden." The latter criticism, which is recognized by Anderson *et al.* (159-60), means that if polluters must pay their charges even as they work to reduce effluents (which normally takes some time and investment), they will effectively be paying twice for the same pollution. To avoid this dilemma, charges should not be collected until after a certain grace period has passed, to allow time for compliance. But if one delays long enough, the so-called "effluent charges" become an installment system for assessing fines for noncompliance, similar to conventional regulation.

While there is no harm in considering alternative modes of inducing firms to comply with pollution regulations, to treat this as a revolutionary break with conventional practice—one that will sweep away all opposition to meeting environmental standards—is sheer wishful thinking. In the end, capitalist corporations will only be compelled to clean up the mess they have made if (1) governments come armed with strong pollution control laws backed by sufficient popular and political support, or (2) if other pressures—such as union contracts or large civil awards to injured parties—send offenders scurrying for regulatory cover. The principal problem facing environmental regulation is not inefficiency, muddling or uncertainty, but the lack of real power over polluters. As this is lacking in most conventional regulatory efforts, the predictable result is lax standards, poor enforcement and trivial fines. The same conditions would obtain if effluent charges were adopted. All the clever economic logic in the world cannot grant regulators an ounce of power more.

4. ECONOMIC IMPACTS

In addition to business power, environmental regulation runs up against limits imposed by the economic environment within which business operates. Some of the gravest threats to enforcement of pollution control regulations are declining industries, aging plants with low profitability and obsolete equipment, the difference in adaptability of large and small firms, the pressures of interregional and international competition, regional dependence on specialized employment bases and general economic recession. These are the situations in which the costs and changes demanded by pollution regulations really do matter. The adverse economic impacts may become sufficiently serious for both industry and the people who depend on it for jobs and regional income to force a political retreat from full enforcement of environmental standards.

Anderson *et al.* are aware of the problem of adverse economic impacts and suggest various modifications of the charges scheme in order to deal with it: hardship

exemptions, lower charges for small business, variable regional rates, separate charges for new and old sources. Their pragmatism is to be saluted. But by the time one makes all the above adaptations to the pure system of effluent charges, the regulatory "automaton" becomes a Rube Goldberg mechanism. These modifications may make effluent charges more practical to implement in the face of an unruly economic reality, but they are an admission that effluent charges do not offer any inherent advantages over direct regulation in coping with economic dislocation.

The chief argument for the superiority of effluent charges, it may be recalled, was that they lowered the overall costs of reaching the same ambient environment quality levels. One pillar of the argument is the assumption that industry can find a cheaper way of reducing its discharges than the technologies "imposed" by regulators. Even if this proposition were true on the average, it would still not apply to the case of economically marginal industries, plants or regions, which are those most subject to economic dislocation. These are frequently the most heavily polluting industries and most polluted areas (*e.g.*, steel plants in the Mahoning Valley, Ohio). They are, at the same time, the least likely to find a cheaper way to cut pollution control costs precisely because they have the oldest equipment, the worst record of technical innovation, the lowest profits and the lowest rate of investment in new plant and equipment. The same kind of argument may be made about small firms, which normally suffer from lower profits and lower technical competence, owing to a lack of skilled managers, engineers and technicians. Economic contractions pose a similar set of difficulties, as even more firms come under financial pressure and cut back on investment. *Any* system of negative penalties, whether direct standards and fines or effluent charges, must confront the inability of certain industries, firms, plants or regions to respond flexibly and without suffering significant economic dislocation. (Conversely, the regulators must confront the ability of those adversely affected to respond vigorously in the realm of lawsuits, popular mobilization and political action.)

Regulation must therefore cope with the economically weak—the losers in the uneven race of capitalist growth. But even vital sectors sometimes cannot tolerate regulation either. The microprocessor industry of Silicon Valley, for example, is one of the leading edges of the contemporary economy. Chip-making also poses significant health hazards to workers and community through its heavy use of solvents. Yet because the industry is beset by intense internal and foreign competition, it has very little leeway to indulge such demands as labor unions or environment health protection.

It may seem as if my argument has at this point created a contradiction, to wit: first effluent charges are criticized on the grounds that the cost of regulation is not important; then they are criticized because they do not cope any better with situations where costs (and lack of innovation) are a problem. All this is quite consistent, however, if one recognizes that *averages* mean very little, and that industries, plants, firms, regions, and national economies differ a great deal from one another, from one place to another and from one time to another. We do not live in the homogeneous world of neoclassical production functions, perfect markets and full employment assumptions. Nor is it a world of *natural* scarcity as the neoclassical economists assume, so much as one in which scarcity is a social creation. The modern United States is a very rich country indeed and well able to afford a large measure of pollution reduction without sacrificing the standard of living of the mass of its population. Public opinion polls, moreover, regularly show that the American people want a cleaner environment and are willing to pay something for that purpose. A reasonably clean and safe environment may not be possible, however, in a capitalist context where distribution is grossly unequal, production is for profits not social use, and competition is unchecked by any significant social planning. At one pole resources are massively squandered, while at the other, firms, plants, regions, communities, and workers are constantly marginalized and put in jeopardy of survival. In other words, the capitalist order forever puts us in the position of making unpleasant choices between things like jobs and environmental quality or community survival and worker health. (A good example of the dilemma is the Colorado lead company that claimed imminent bankruptcy and closure, thereby forcing workers to agree "voluntarily" to lower health and safety standards) Pollution regulation is thus forced to grapple with the very nature of the capitalist economy itself.

CONCLUSION

In sum, the contemporary dilemma of pollution regulation is not principally owing to the inherently unbearable costs of control nor unworkable regulatory procedures. Of course, control can be costly and bureaucracies can be incompetent, so some experimentation with modified effluent charge schemes is certainly warranted. But the notion that charges are the regulatory panacea that will automatically yield a cleaner environment at a lower price is wishful thinking—or worse, a harmful mystification that hides from view most of the fundamental reasons why pollution control is so hard to achieve. The proponents of charges give short shrift to the following basic issues:

(1). The political difficulty of determining what level of pollution is socially tolerable, i.e., the inherently non-scientific nature of risk-benefit assessment.

(2). The weak scientific base for evaluating the health hazards and ecological effects of various pollutants.

(3). The poor scientific foundation for ambient media modeling, i.e., our inability to trace the multitude of pollutants from the point of discharge to point of effect.

(4). The poor knowledge base for assessing technological possibilities for pollution control and industrial adaptation.

(5). The grave dangers posed by radiation, certain synthetic chemicals, and other extremely toxic materials in the workplace and the global environment.

(6). The beneficial role of conflict in the making of social decisions where knowledge is highly imperfect and interests differ.

(7). In particular, the virtue of open disagreement in a democratic society versus the rule of so-called experts.

(8). The adversary relationships, fundamentally opposed interests and unequal power among people in a class society, and the ability of dominant classes to impose their will more often than the dominated classes.

(9). The limitations put on regulation by economic dislocation and economic competition, in particular the problems created by the highly uneven process of capitalist growth in space and time.

(10). The uncontrollable nature of the pollution problem in an economy in which product proliferation, technological innovation and the exploitation of labor (and nature) are the essence of gain and of competitive advantage.

(11). The lack of autonomy of governments from the economic base and power relationships of the society they seek to regulate.

I am not so foolish as to think that industrial societies can easily solve the problem of pollution (i.e., the adverse environmental effects of production, consumption and growth). The large-scale appropriation, transformation, transfer and application of natural materials to human ends necessarily involve unintended adverse impacts on biological and physical systems. Moreover, human betterment will always be plagued by problems of inadequate knowledge, self-aggrandizement, slavishness, failure to anticipate consequences, and the like. Even problems of class inequality, uneven economic development and lack of economic planning are not likely soon to disappear from the face of the earth. But this does not mean that industrialism need be as rapacious and unhealthy as it is under capitalism. Neither that system of production nor the environmental problem as we know it today are natural products of human nature, natural scarcity or the inevitable logic of industrial or bureaucratic systems.* Improvement is possible. Nevertheless, it may be questioned whether pollution control of any reasonable sort can ever be achieved under capitalism, especially the free-wheeling American variety.

That sort of revolutionary question is rather hard to answer. But the more immediate one of whether significant progress in environmental pollution control has been made in the last decade of environmental awareness and mobilization is not so hard. We are barely holding our own, and may be doing much worse. Toxic chemical proliferation, for example, is quite out of hand in the United States (and indeed the whole world) today. Regulation has barely touched the problem. New products and new uses expand by the thousands each year. Deadly refuse dumps proliferate, groundwater supplies are poisoned, toxins concentrate in the food chain, and even oceans are badly contaminated. Cancer and birth defect rates continue to rise. The chemical industry's vicious antipathy to controlling the problem has not changed. Personally, I am outraged at the harm done to the innocent and the powerless by the chemical companies' malfeasance. I therefore have little tolerance for those who present the chemical industry (or steel, electric power, or electronics) as well-meaning "corporate citizens" put upon by heavy-handed government regulators or the naivete of those who try to sell effluent charges as the solution to all environmental abuses. The inherently political nature of pollution control will not yield to elegant models of optimization. It is grim testimony to the ideological nature of so much current academic activity that book after book should be published touting effluent charges as the cure-all for environmental problems and that neoclassical economics should be the underpinning for what passes as social scientific analysis of pollution control. True faith in the market and quasi-market mechanisms as a means of organizing society, directing public policy and solving difficult human problems "automatically" is touching in its innocence, but dangerous in its implications. In their inability or unwillingness to face reality, liberal environmental economists end up not very far away from the conservatives who would free the capitalists from such social constraints as currently exist. In the age of Reagan and Thatcher, this attitude is the enemy of progress, including progress in pollution control.

*A mark of the distance between Anderson *et al.* and American social reality is their blithe treatment of cases of effluent charge policies from Eastern Europe as if they were interchangeable with the United States. State Socialism is a rather different form of society from what prevails here. Moreover, one should note that the most successful instances of effluent charge regulation are, by the authors' own admission, to be found in Eastern Europe, not in the West.