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ENVIRONMENTAL TQM: ANATOMY OF A POLLUTION CONTROL PROGRAM THAT WORKS!

*E. Donald Elliott**

TOTAL QUALITY MANAGEMENT: A FRAMEWORK FOR POLLUTION PREVENTION. By *Quality Environmental Management Subcommittee, President's Commission on Environmental Quality*. Washington, D.C. 1993. Pp. x, 104.

"To govern simply by statute, and to reduce all to order by means of pains and penalties, is to render the people evasive, and devoid of any sense of shame.

"To govern upon principles of virtue, and to reduce them to order by the Rules of Propriety, would not only create in them the sense of shame, but would moreover reach them in all their errors."¹

— Confucius, c. 500 B.C.

I

"When law succeeds, it puts itself out of business."

That statement is not *always* true, of course. The term *law* is broad and imprecise. It certainly is true, however, for activist regulatory forms of law, such as environmental law. The purpose of law in the activist mode is to change the norms and behavior of a community or subcommunity. Complete success would eliminate the need for additional legal acts to reinforce the message and would undermine the law's continued reason for being. Conversely, the more obvious and intrusive legal machinery is at any given time or place, the less successful the law has been in achieving its ultimate goal of "voluntary"²

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1. THE WISDOM OF CONFUCIUS bk. 2, anal. 3, at 12 (William Jennings trans., 1990). "In this passage, imposed order based on regulation and edict is contrasted with political harmony effected through example, participation, and moral edification." DAVID L. HALL & ROGER T. AMES, THINKING THROUGH CONFUCIUS 175 (1987) (citation omitted).

2. The term *voluntary compliance* is probably too well established to be expunged from lawyers' vocabularies, but it is ambiguous and potentially misleading. The word *voluntary* implies that the motivations for compliance are internal. In fact, a private actor will often comply with legal norms in whole or in part because of the system of incentives created by the law. In this situation, compliance is "voluntary" only in the sense that no one has to invoke the formal machinery of law enforcement to achieve its purposes. Cf. E. Donald Elliott, INS v. Chadha:

compliance.

II

Breathe easy, environmental lawyers of the world: we're not quite there yet. Environmental law was the single largest growth area for lawyers in the last decade.³ Beginning slowly in about 1970, environmental law — and the demand for environmental lawyers — mushroomed in importance in the 1980s.⁴ This dramatic growth was fed in large part by the enormous appetite of the Superfund program for “transaction costs,” principally in the form of lawyers.⁵ But as environmental law gradually succeeds at changing the prevailing norms of society, particularly in the business world,⁶ the transition from environmental law to environmental management has already begun.

A window has recently opened into the new world, in which implementing environmental norms in practice is more important than establishing them in theory. It is a remarkable document: *Total Quality Management: A Framework for Pollution Prevention*, by the Quality Environmental Management Subcommittee of the President's Commission on Environmental Quality.⁷ The PCEQ-TQM Report is a document with profound implications and should be required reading for anyone who is serious about the environment. The report emanates from an unlikely source for innovation — a subcommittee of a now-disbanded presidential commission.

The Administrative Constitution, the Constitution and the Legislative Veto, 1983 SUP. CT. REV. 125, 152 (stating that “the most effective kind of power [is] the kind that does not have to be used to be effective”).

3. See PHILIP SHABECOFF, *A FIERCE GREEN FIRE: THE AMERICAN ENVIRONMENTAL MOVEMENT* 134 (1993) (“Environmental law has been for some time the fastest-growing sector of the American bar.”).

4. See Alain L. Sanders, *Battling Crimes Against Nature*, TIME, Mar. 12, 1990, at 54, 54 (describing 20,000 environmental lawyers as “some of the most sought after professionals”); see also E. Donald Elliott, *Environmental Law at a Crossroad*, 20 N. KY. L. REV. 1, 2 (1992) (noting that environmental law has become like tax law — a significant factor in every business transaction).

5. LLOYD S. DIXON ET AL., *PRIVATE-SECTOR CLEANUP EXPENDITURES AND TRANSACTION COSTS AT 18 SUPERFUND SITES* at xii, 25 (1993) (reporting that transaction costs exceeded 60% of costs for 50% of firms spending over \$1000, and that almost two-thirds of the transactions costs were for legal services); see generally JAN P. ACTON ET AL., *SUPERFUND AND TRANSACTION COSTS: THE EXPERIENCES OF INSURERS AND VERY LARGE INDUSTRIAL FIRMS* (1992).

6. To date, environmental law has primarily focused on controlling pollution from large industrial sources. If progress is to continue in the years ahead, the focus will have to shift to controlling the pollution from smaller sources and from consumer behavior. See Francis S. Blake, *The Economic Impacts of Environmental Regulation*, NAT. RESOURCES & ENVTL., Summer 1990, at 23, 56; William K. Reilly, *The Future of Environmental Law*, 6 YALE J. ON REG. 351, 352-53 (1989).

7. QUALITY ENVTL. MANAGEMENT SUBCOMM., PRESIDENT'S COMM. ON ENVTL. QUALITY, *TOTAL QUALITY MANAGEMENT: A FRAMEWORK FOR POLLUTION PREVENTION* (1993) [hereinafter PCEQ-TQM REPORT].

On July 23, 1991, President Bush appointed the President's Commission on Environmental Quality (PCEQ), chaired by Michael R. Deland, who was then chairman of the Council on Environmental Quality.⁸ The twenty-five-member commission consisted primarily of CEOs of major U.S. corporations, joined by three environmentalists and two university presidents. At the same time the PCEQ-TQM Report appeared, the PCEQ itself produced a report describing its own work and conclusions, which was released on January 13, 1993, one week before the Clinton administration took office. This report, *Partnerships to Progress*,⁹ describes what President Bush had called a "new environmentalism" — a more productive, less adversarial mode of environmental action that "harnesses the power of the marketplace in service of the environment."¹⁰ Had President Bush been reelected, those seeking clues to environmental policy in a second Bush term might have eagerly devoured this report. Coming out as it did, a week before the inauguration of his successor, it received somewhat less attention, to put it mildly.¹¹

Unlike most presidential commissions, which merely issue advisory reports and recommendations, the Bush PCEQ was tasked actually to "develop and test practical, innovative ideas"¹² through a series of ten demonstration projects. Of these, the most interesting and significant was the project to apply to pollution prevention projects the principles of Total Quality Management (TQM), an approach to managing organizations developed by the late W. Edwards Deming and widely applied in Japan.¹³ The PCEQ assembled a Quality Environmental Management Subcommittee intending to "demonstrate the viability of Total Quality Management (TQM) as a method for achieving pollution prevention" (p. vii). The subcommittee's PCEQ-TQM Report concludes that "Total Quality Management (TQM) and Pollution Prevention are complementary concepts" (p. ix) and that "TQM offers

8. 1991 PUB. PAPERS app. A, at 1677 (July 23, 1991). See Exec. Order No. 12,737, 3 C.F.R. 324 (1990), reprinted in 42 U.S.C. § 4321 (Supp. III 1991) (establishing the PCEQ). Although the author of this review served as general counsel of the EPA in the Bush administration, he left the administration in August 1991, shortly after the members of the PCEQ were appointed, and had no involvement with their work.

9. PRESIDENT'S COMM. ON ENVTL. QUALITY, PARTNERSHIPS TO PROGRESS (1993) [hereinafter PCEQ REPORT].

10. Letter of Transmittal, in PCEQ REPORT, *supra* note 9, at 2.

11. It should be noted, however, that the Clinton administration has subsequently endorsed the concept of "partnerships" in the environmental area. AL GORE, FROM RED TAPE TO RESULTS: CREATING A GOVERNMENT THAT WORKS BETTER & COSTS LESS 63 (1993) (Report of the Natl. Performance Review).

12. Letter of Transmittal, *supra* note 10, at 2.

13. An excellent account of Deming's life and an introduction to his ideas can also be found in his recent obituary. John Holusha, *W. Edwards Deming, Expert on Business Management, Dies at 93*, N.Y. TIMES, Dec. 21, 1993, at A13; see also *infra* Part V (discussing TQM as applied to environmental management).

an approach that all companies can use to achieve environmental improvements" (p. x).

The report looks like a typical, slick corporate annual report, complete with glossy, four-color photos, charts, and graphics. The aura of corporate boosterism, however, should not obscure the extraordinary significance of the report's contents. The PCEQ-TQM Report on the use of Total Quality Management in preventing pollution is an important document that signifies a basic transformation in the history of environmental regulation in the United States. It should not pass unnoticed into the oblivion of federal depository library shelves. Page after page of the PCEQ-TQM Report relates stunning success stories of rapid and dramatic reductions in pollution that are uncommon, if not unprecedented, in the history of U.S. environmental law.¹⁴ The results reportedly¹⁵ achieved at the twelve sites participating in the demonstration projects were nothing less than dramatic:

Dow Chemical achieved a 29 percent reduction in ethylene oxide fugitive emissions and preliminary results on their waste management project indicate a 67 percent reduction in the amount of material sent to waste treatment facilities.

GE estimates that 1,1,1 trichloroethane use will be decreased by 95 percent by year-end.

DuPont's generation of ammonium sulfate was reduced from more than 100 million pounds per year to less than 40 million pounds per year.

International Paper's Androscoggin Mill reduced fiber lost to the paper machine sewers from 60 tons to less than 25 tons per day through a rigorous self-audit and the development of an innovative mobile recovery pump. In addition . . . loading to the wastewater treatment system was reduced which improved effluent quality by more than 50 percent.

Ford is replacing, on a business plan cycle basis, its trichloroethylene (TCE) vapor degreasers with an aqueous degreasing system that demonstrated superior processing quality and improved environmental conditions for employees and the community.

At the 3M plant, generation of waste was reduced by 10 percent.

Procter & Gamble's Mehoopany, Pennsylvania, paper and pulp manufacturing plant eliminated the use of chlorine for converting broke bleaching and improved pulp washing which decreased sulfur dioxide, ammonia and chloroform releases. [pp. 41-42]

The report summarizes the results of the project by stating:

[S]ignificant pollution prevention and economic savings . . . resulted

14. See *infra* Parts III-IV (discussing the failures of traditional, legalistic environmental regulation).

15. Some caution is appropriate in evaluating the reported results. The sources for the information described in the PCEQ-TQM Report were the companies themselves, and the subcommittee did not independently verify their claims. In the related context of the EPA's 33/50 program, intended to encourage companies to reduce their releases of toxic chemicals into the environment, see text accompanying note 42; some have voiced skepticism, contending among other things that the claimed reductions either are spurious or would have been made anyway for other reasons.

from a dozen diverse demonstration projects and . . . [i]n the aggregate, these projects accomplished the following:

Eliminated millions of pounds of pollutants from manufacturing processes.

Saved substantial sums of money.

Increased the efficiency or effectiveness of the production process.

Improved the quality of products and services.

Enhanced public perception of the company or its products.

Improved employee morale. [p. vii]

The PCEQ-TQM Report concludes: "If these projects are any indication of the power of TQM to reduce or prevent pollution, then the QEM [Quality Environmental Management] Subcommittee is confident in stating that, with the proper incentives and flexibility to innovate, private-sector voluntary programs are a cost-effective and expeditious route to improving the quality of the environment" (p. x).

To the sophisticated postmodern lawyer, grown jaded on zero-sum games and the prisoner's dilemma, it all sounds too good to be true. But if TQM really does work in practice, perhaps eventually it can also work in theory.¹⁶ Besides, it is not as if our existing technologies for implementing pollution controls are so successful that we have nothing to learn.

III

The success stories related in the PCEQ-TQM Report contrast sharply with the disappointing record of traditional strategies used in U.S. environmental law to achieve its stated goals.¹⁷ The staple approach used by environmental law in the United States to regulate pollution during the modern era from about 1970 to the present has been *government standard setting through legalistic bureaucracy*.¹⁸ This approach to pollution control involves an elaborate, time-consuming legal-political process¹⁹ to develop legally enforceable pollution limits. The government can set these limits in various ways,

16. In a recent article applying TQM principles to a different legal problem, the author of this review contends that TQM can be understood as a way of restructuring payoffs in existing organizations and thereby potentially transcending static zero-sum games. See E. Donald Elliott, *TQM-ing OMB: Or Why Regulatory Review Under Executive Order 12,291 Works Poorly and What President Clinton Should Do About It*, LAW & CONTEMP. PROBS., Winter 1994, at 167.

17. For a typical statement of goals for a modern U.S. environmental statute, see the Clean Air Act § 101(b)-(c), 42 U.S.C. § 7401(b)-(c) (1988 & Supp. III 1991).

18. See E. Donald Elliott & E. Michael Thomas, *Chemicals*, in SUSTAINABLE ENVIRONMENTAL LAW § 17.1(B)(3), at 1257, 1266-70 (Celia Campbell-Mohn et al. eds., 1993); Elliott, *supra* note 4, at 3-5.

19. For fictionalized accounts of this process in (in)action, see Douglas M. Costle, *Brave New Chemical: The Future Regulatory History of Phlogiston*, 33 ADMIN. L. REV. 195 (1981); Elliott, *supra* note 16, at 171-74; see also JOHN QUARLES, CLEANING UP AMERICA: AN INSIDER'S VIEW OF THE ENVIRONMENTAL PROTECTION AGENCY (1976) (EPA's first general counsel describing difficulties encountered in developing regulations).

based on technology or on scientific predictions of the effects of pollution on public health and the environment. The limits can allow varying degrees of weight to be given to economics and other countervailing considerations. Pollution limits can be site specific, applicable to an industry or industry segment, or even nationwide in application. Whatever their basis and scope, however, the basic standard-setting approach predominantly used to regulate pollution in the United States requires, as an essential first step to pollution reductions, that *government officials* determine what an acceptable amount of pollution would be.

The government standard-setting approach has many advantages. First and foremost, government standard setting is symbolically and politically satisfying to those who engage in these activities.²⁰ Government standard setting allows politicians and bureaucrats to tell themselves and others that their actions are having an important effect on cleaning up the environment.²¹ Because government officials are typically persons who have bypassed greater personal economic opportunities for public service, an economist would say that they have revealed a preference²² involving a higher-than-average taste for doing what people in government do — perhaps exercising control, perhaps benefiting others. Either way, one should never underestimate the importance of personal psychic satisfaction to the regulators in influencing the selection of regulatory techniques. Indeed, it is possible to speculate that the well-documented resistance of career bureaucrats toward economic incentive approaches to environmental regulation²³ is attributable in large part to the fact that the creation of a market in pollution rights eliminates most opportunities for bureaucrats to do the things that make them feel that they are having an important effect for the public good. It is no exaggeration to say that most career environmental regulators have invested their lives in the proposition that government standard setting is an important activity and therefore

20. For an account of environmental lawmaking that sees “competitive credit-claiming” by political entrepreneurs as the essential driving force, see generally E. Donald Elliott et al., *Toward a Theory of Statutory Evolution: The Federalization of Environmental Law*, 1 J.L. ECON. & ORG. 313 (1985).

21. The title of the fine book by the EPA’s first general counsel — CLEANING UP AMERICA — illustrates the point. See QUARLES, *supra* note 19. When one is writing regulations, one does feel as though one is “cleaning up America.” Alas, however, the two are different, and, as Quarles and other critics recognize, we should measure our success in the environmental area not by counting numbers and pages of regulations but rather by assessing actual changes in environmental quality. See MARC K. LANDY ET AL., *THE ENVIRONMENTAL PROTECTION AGENCY: ASKING THE WRONG QUESTIONS* 6-7 (1990).

22. For an explanation of “revealed preferences” in economics, see E.J. MISHAN, *COST-BENEFIT ANALYSIS* 402-08 (4th ed. 1988); Marcel K. Richter, *Revealed Preference Theory*, in 4 *THE NEW PALGRAVE: A DICTIONARY OF ECONOMICS* 166 (John Eatwell et al. eds., 1987).

23. See, e.g., BRIAN J. COOK, *BUREAUCRATIC POLITICS AND REGULATORY REFORM: THE EPA AND EMISSIONS TRADING* (1988); STEPHEN KELMAN, *WHAT PRICE INCENTIVES?: ECONOMISTS AND THE ENVIRONMENT* (1981).

would find it personally very difficult to support changes that would minimize their own centrality.

In addition to making bureaucrats, politicians, and the public feel that something is being done to control pollution, an additional benefit of the government standard-setting approach is that it requires, and therefore also creates incentives to produce, a great deal of information about environmental conditions and pollution control techniques. Most of what we know about the costs and benefits of environmental protection and various control techniques has been generated as a by-product of the environmental regulatory effort.

However, among the notable drawbacks of government standard setting as an approach to pollution control is that it is a slow, inefficient, and expensive way of actually reducing pollution. Critics across the political spectrum have documented that our present standard-setting approach to pollution control works, but that it works slowly and crudely and wastes an enormous amount of time and money. Environmentalist Barry Commoner has been among the most outspoken critics, beginning with a 1987 speech, provocatively titled "Failure of the Environmental Effort."²⁴ Commoner later elaborated on his argument in his book, *Making Peace with the Planet*.²⁵ In both, Commoner mounts an impressive case, backed by official facts and figures, to show that progress in actually cleaning up the environment has been quite modest, despite an enormous effort. The key to Commoner's critique is its point of view: rather than evaluating the success or failure of the environmental effort in terms of intermediate bureaucratic measures, such as numbers of statutes passed or regulations issued or dollars spent, Commoner looks at the ultimate question: whether the environment is actually getting better as a result of our efforts. Although Commoner's conclusion — "failure" — is probably too extreme and simplistic,²⁶ as his proposed solution — socialism — certainly is, Commoner nonetheless mounts an impressive case that the U.S. strategy for controlling pollution through setting governmental standards has been a disappointment.

Critics from the opposite end of the political spectrum generally share Commoner's essential conclusions about the ineffectiveness of government standard setting as a pollution control strategy. Conservative critics also argue that centralized, bureaucratic standard set-

24. Barry Commoner, *Failure of the Environmental Effort*, 18 *Envtl. L. Rep.* (Envtl. L. Inst.) 10,195 (June 1988).

25. BARRY COMMONER, *MAKING PEACE WITH THE PLANET* (1990).

26. Elsewhere, the author of this review endorses the "qualified success" judgment of another EPA critic, Steven Cohen. See Steven A. Cohen, *EPA: A Qualified Success*, in *CONTROVERSIES IN ENVIRONMENTAL POLICY* 174 (Sheldon Kamieniecki et al. eds., 1986), cited with approval in Elliott & Thomas, *supra* note 18, § 17.5(d), at 1351 n.565. But see Reilly, *supra* note 6, at 352 (By comparison to other domestic initiatives, the environmental efforts of the 1970s are "one of the great success stories of American life and history.").

ting by government is an inherently inefficient and cumbersome way to control pollution.²⁷ Because the conservative critique is typically expressed in the language of “inefficiency,” and the costs of inefficiency are usually measured in money, some people do not appreciate that the true price for the misallocation of our scarce environmental resources is paid not only in dollars but also in other environmental problems left unaddressed.²⁸ In the United States, we spend roughly the same percentage of our gross national product on pollution controls as do other advanced industrialized nations; I suspect that we get far less substantive benefit in risk reduction for our money,²⁹ in part because our effort is “an inch wide and a mile deep” — focusing on relatively few substances that we regulate very heavily — but also because a large percentage of what we spend is wasted on transaction costs, largely made up of lawyers, consultants, and delay.³⁰

There are now a number of fine academic reviews of the U.S. environmental effort over the last quarter century.³¹ They, too, generally reach a mixed conclusion like those of Commoner and the conservative critics: Yes, we have made measurable progress in many areas, actually cleaning up some areas of the environment and slowing the rate of environmental degradation in others. Overall, however, the effort leaves plenty of room for improvement: the rate of progress has been slow, the costs have been high, and much, much more remains to be done. This has led some, including the author of this review, to

27. See, e.g., ENVIRONMENTAL POLITICS: PUBLIC COSTS, PRIVATE REWARDS (Michael S. Greve & Fred L. Smith, Jr., eds., 1992); RICHARD L. STROUP & JOHN A. BADEN, NATURAL RESOURCES: BUREAUCRATIC MYTHS AND ENVIRONMENTAL MANAGEMENT (1983).

28. See Elliott, *supra* note 4, at 6, 7. But see David Durenberger, *A Dissenting Voice*, EPA J., Mar.-Apr. 1991, at 49 (opposing comparative risk assessment as a method of establishing priorities and arguing that money “wasted” on programs like Superfund would not in fact be reallocated to other, more beneficial programs, such as reducing infant mortality).

29. See Elliott, *supra* note 4, at 2.

30. See generally DIXON ET AL., *supra* note 5, ACTON ET AL., *supra* note 5.

31. See, e.g., LANDY ET AL., *supra* note 21; R. SHEP MELNICK, REGULATION AND THE COURTS: THE CASE OF THE CLEAN AIR ACT (1983); Cohen, *supra* note 26; Richard J. Lazarus, *The Tragedy of Distrust in the Implementation of Federal Environmental Law*, LAW & CONTEMP. PROBS., Autumn 1991, at 311, 348. Lazarus cites numerous examples of regulatory failure but concludes that

this nation's accomplishments in seeking to produce a legal regime for environmental protection have been extraordinary. . . . Viewed from this perspective, repeated regulatory failure could be seen as the necessary cost of our attempt to address pressing environmental problems in the face of scientific uncertainty. There was not sufficient time to delay governmental action until its environmental objectives could have been fairly and accurately defined.

Id. at 348. See also SHABECOFF, *supra* note 3, at 134 (“Yet many environmentalists and other commentators, including [Environmental Law Institute President J. William] Futrell have expressed disappointment over the results [under the environmental laws of the 1970s].”); Richard B. Stewart, *Economics, Environment, and the Limits of Legal Control*, 9 HARV. ENVTL. L. REV. 1, 4-6 (1985) (criticizing bureaucratic standard setting as “Soviet-style centralized planning” applied to the environment).

conclude that "you can't get there from here"³² — that the strategies of centralized, bureaucratic control by government, while necessary, will not be sufficient to deal with the plethora of small, diffuse sources of pollution that we must control if we are to make continued progress in the years ahead.³³

The Gore-Browner era in environmental protection is about to launch the country into a new round of ambitious statutory revisions. In light of the long and well-documented record showing that promulgating more and better statutes and regulations is actually not a very effective strategy for reducing pollution, perhaps it is time to look seriously at the claims made in the PCEQ-TQM Report that an alternative strategy for reducing pollution will actually work.³⁴

IV

One factor distinguishing the new approach to pollution reduction described in the PCEQ-TQM Report from the traditional government standard-setting approach is the role of the government.

The traditional government standard-setting approach makes complex information processing by government officials a precondition to pollution reductions.³⁵ Necessary actions by government take the form of rulemaking and judicial review, often followed by a separate stage of implementation, such as the writing of permits on the state level, to translate the general standards into source-specific emission limitations. Because the government's resources are limited and due process is slow, it often takes the government a very long time to regulate individual pollution sources.³⁶

32. See Peter Brimelow & Leslie Spencer, "You can't get there from here," *FORBES*, July 6, 1992, at 59, 61 (quoting the author of this review).

33. See Reilly, *supra* note 6, at 352-53.

34. It is important to be clear that the author is not in favor of replacing government regulation with the other approaches discussed elsewhere in this review but advocates a "hybrid" system in which both regulatory standard setting and incentive-based approaches have a role to play. See Elliott, *supra* note 4, at 19-21; Elliott & Thomas, *supra* note 18, § 17.5(D), at 1352-53.

35. Recently, several other commentators in the environmental field have begun to focus on the information-processing demands of the existing regulatory regime. See John S. Applegate, *The Perils of Unreasonable Risk: Information, Regulatory Policy, and Toxic Substances Control*, 91 *COLUM. L. REV.* 261 (1991); Alyson C. Flournoy, *Legislating Inaction: Asking the Wrong Questions in Protective Environmental Decisionmaking*, 15 *HARV. ENVTL. L. REV.* 327 (1991); see also E. Donald Elliott, *Goal Analysis Versus Institutional Analysis of Toxic Compensation Systems*, 73 *GEO. L.J.* 1357, 1367 (1985) (arguing that legal institutions ought to be designed with reference to the availability of information).

36. One clear example of the long delays that afflict the government standard-setting process is the history of § 112 of the Clean Air Act concerning air toxics. Since § 112 was enacted in 1970, the EPA managed to regulate only seven substances before Congress in 1990 massively altered the statutory scheme in frustration with the slow pace of regulation. See Clean Air Act Amendments of 1970, Pub. L. No. 91-604, § 112, 84 Stat. 1676, 1685-86, amended by Clean Air Act Amendments of 1990, Pub. L. No. 101-549, § 301, 104 Stat. 2399, 2531-74 (codified as amended at 42 § U.S.C. 7412 (Supp. IV 1992)); H.R. REP. No. 952, 101st Cong., 2d Sess. 338-42 (1990), reprinted in relevant part in 1990 U.S.C.C.A.N. 3867, 3870-74.

Even worse than the delay in setting standards, however, is the perverse effect in the meantime of the threat that the government may regulate later but refuse to give credit for previous reductions. This threat tends to paralyze pollution sources, preventing them from taking independent action to reduce pollution since they may not receive credit for these reductions later.

Moreover, at a crucial, symbolic, expressive level, the lesson of command-and-control government regulation is that corporate polluters will not take any action to reduce pollution unless confronted with a governmental threat, "backed ultimately by the U.S. Army."³⁷ To the extent that this assumption becomes a self-fulfilling prophecy, as noted in the epigram from Confucius,³⁸ the law may actually frustrate its own goals by teaching obedience rather than responsibility.

In contrast to the traditional standard-setting approach, in which virtually nothing happens unless and until the government takes a series of complex actions, in the private pollution prevention programs described in the PCEQ-TQM Report, the government is conspicuous by its absence. The report hardly mentions the government and certainly does not portray it as the driving force behind any of the pollution reductions. That could easily lead the casual reader to the mistaken conclusion that the dramatic pollution reductions described in the report are entirely voluntary. They are "voluntary" in the limited sense that the government is not micromanaging or mandating the specific actions taken. On the other hand, however, there is no reason to believe that the corporate community is acting out of a sudden burst of increased altruism.

I prefer the term *private* to the term *voluntary* for characterizing the species of corporate behaviors described in the PCEQ-TQM Report. In my view, private pollution prevention efforts are not truly *voluntary*, in the sense of being exclusively self-motivated, but rather stimulated in large part by successful government action in creating appropriate and effective incentives for private action.³⁹ In one sense, of course, all government regulation involves creating incentives for private action.⁴⁰ What differs between traditional command-and-con-

37. Cf. Arthur A. Leff, *Injury, Ignorance and Spite — The Dynamics of Coercive Collection*, 80 YALE L.J. 1, 8 (1970) ("[B]ehind every final judgment procured in any court in this country stands, ultimately, the United States Army . . ."); E. Donald Elliott, *Why Punitive Damages Don't Deter Corporate Misconduct Effectively*, 40 ALA. L. REV. 1053, 1068-71 (1989) (criticizing punitive damage awards on similar grounds).

38. See text accompanying note 1, *supra*.

39. See *supra* note 2.

40. E. Donald Elliott, *Regulating the Deficit After Bowsher v. Synar*, 4 YALE J. ON REG. 317, 346 (1987) (defining regulation as "preserving the nominal freedom of individuals to make private decisions . . . [while] altering the structure of incentives individuals face when making their decisions"); E. Donald Elliott, *Re-Inventing Defenses/Enforcing Standards: The Next Stage of the Tort Revolution?*, 43 RUTGERS L. REV. 1069, 1083 (1991) (Pfizer Distinguished Lecture on Tort Law).

trol standard-setting regulation and so-called economic incentive-based systems is the level of generality at which the government creates incentives.⁴¹ The difference in the nature of the incentives created is not just a detail; it goes to the essence of effective government. After all, the literature about regulation in general, and environmental regulation in particular, is not rife with success stories. If in some areas the government seems to have been unusually successful in achieving its regulatory goals, it may be worthwhile to attempt to understand the sources of the success and to learn lessons that may be replicated in other areas.

One may properly criticize the PCEQ-TQM Report for not addressing with more thoughtfulness and in more detail the types of government actions that best facilitate successful private pollution-prevention efforts. The only apparent reference in the report to the government's role is a single parenthetical caveat, in which the report maintains that "*with the proper incentives and flexibility to innovate,*" private pollution-prevention efforts can be effective (p. x; emphasis added). But in those few words lies quite a tale.

In the case of the private pollution-prevention efforts the PCEQ-TQM Report describes, the government's role consisted of four steps: (i) creating a system of general background incentives, in the form of information that focused public pressure, as well as economic and other incentives; (ii) issuing a public challenge to polluters to achieve a clear goal of pollution reductions, formulated in broad, general terms; (iii) offering positive rewards — as opposed to negative threats — in terms of public recognition; and (iv) providing useful tools in the form of information, but not mandating the details of how to achieve pollution reductions. Examples of government programs implementing step three — providing positive reinforcement for desirable corporate conduct through public recognition—include the industrial toxics project — also known as the 33/50 program, because it seeks reductions of toxic emissions by thirty-three percent by the end of 1992 and by fifty percent by the end of 1995⁴² — the Green Lights⁴³ and Energy Star⁴⁴ programs, and the EPA administrator's awards for environ-

41. See Colloquy, *Providing Economic Incentives in Environmental Regulation*, 8 YALE J. ON REG. 463, 474 (1991) (remarks of author) (pointing out that traditional command-and-control regulations also create incentives); see also Adam Babich, *Understanding the New Era in Environmental Law*, 41 S.C. L. REV. 733, 749-62 (1990) (describing the incentive effects of CERCLA). Babich is a former student of mine, and we share a common approach of analyzing statutes in terms of the incentives they create. This approach may, however, be somewhat older than either of us. See Frank I. Michelman, *Pollution as a Tort: A Non-Accidental Perspective on Calabresi's Costs*, 80 YALE L.J. 647, 666-86 (1971) (reviewing GUIDO CALABRESI, *THE COSTS OF ACCIDENTS* (1970)) (suggesting the applicability of economic incentive analysis to pollution).

42. See EPA's Pollution Prevention Strategy, 56 Fed. Reg. 7849, 7861-64 (1991).

43. 57 Fed. Reg. 60,811 (1992).

44. Exec. Order No. 12,845, 58 Fed. Reg. 21,887 (1993).

mental excellence.⁴⁵

Perhaps the most subtle and least obvious of these steps is the first — creating appropriate background incentives and, in particular, mandating information disclosure. In 1986, Congress enacted the Emergency Planning and Community Right-to-Know Act (EPCRA),⁴⁶ which included a requirement for a Toxic Release Inventory (TRI).⁴⁷ This provision requires companies to provide the EPA with estimates of the amounts of toxic chemicals they are releasing into the environment, and these data are in turn made public.⁴⁸ Elsewhere the author of this review has argued that “[d]isclosure of TRI data to the public has been a powerful incentive to promote ‘voluntary’ pollution reductions.”⁴⁹ The PCEQ-TQM Report provides a good deal of evidence to support the thesis that by requiring companies to disclose information to the public about their toxic pollution, the government creates a powerful incentive for pollution reductions. Of the eleven companies participating in the demonstration projects, at least four specifically mention reducing the release of TRI chemicals as one of the goals of their efforts (pp. 46, 58, 66, 76, 94), and others targeted reductions in the use of chemicals such as trichloroethylene (TCE) that are on the TRI inventory without specifically mentioning TRI (pp. 62-64).

In addition, the PCEQ-TQM Report notes that one of the major benefits to the participating companies was “improved public acceptance” (p. 9):

DuPont noted that probably the single greatest motivating factor in undertaking a QEM program was the enhancement of its Beaumont, Texas, facility’s public image. The Beaumont site’s designation as the second highest source in Texas on EPA’s Toxic Release Inventory (TRI) propelled the company to effect process changes, even though it does not believe that deep-well discharge of ammonium sulfate is detrimental to the environment. [p. 9]

In the aggregate, the recent reductions in the release of toxic chemicals to the environment, accomplished “voluntarily” under public pressure stimulated by the TRI inventory, are probably many times larger than the reductions achieved over twenty years of traditional standard-setting regulation of air toxics.⁵⁰

45. Elizabeth Kirschner, *AICHe Engineers Offer Solutions*, CHEMICAL WK., Aug. 19, 1992, at 10 (stating that EPA “industry award program for overall environmental excellence” follows in the wake of the success of the Green Lights and 33/50 programs).

46. Pub. L. No. 99-499, tit. 3, 100 Stat. 1613, 1728-58 (codified at 42 U.S.C. §§ 11001-11050 (1988)).

47. EPCRA § 313, 42 U.S.C. § 11023 (1988).

48. EPCRA § 313, 42 U.S.C. § 11023 (1988).

49. Elliott & Thomas, *supra* note 18, § 17.1(B)(3), at 1270.

50. U.S. ENVTL. PROTECTION AGENCY, REP. NO. 21K-1006, COMMUNICATIONS & PUB. AFFAIRS, ENVIRONMENTAL STEWARDSHIP: EPA’S FIRST TWO YEARS IN THE BUSH ADMINISTRATION 4 (May 1991) (noting that nine major petrochemical manufacturers have agreed to

Not only have companies learned that public pressure can be an effective regulatory tool against them, particularly if the company sells in the consumer goods marketplace, but environmentalists have learned that lesson as well. In the early days of the environmental movement in the 1970s, environmental activists turned to law, and particularly to the courts, as their "primary tool for environmental reform."⁵¹ The theory was that environmentalists and the public could pressure politicians to pass laws that would mandate regulators to adopt regulations that environmentalists could then go to court to enforce to make polluters do something about their pollution. Increasingly, that logic has proved cumbersome — as the structure of the preceding sentences was intended to demonstrate. Frustrated with the slow pace of traditional, legalistic standard-setting regulation, today's environmentalists are increasingly engaging in *direct regulation* of polluters. Rather than going to the government to seek leverage over polluters, activists use their credibility with the public to go directly to the polluter to negotiate changes in behavior on the public's behalf.⁵²

V

Much that is valuable and interesting in the PCEQ-TQM Report will not come as a surprise to specialists in the environmental area. There has been a growing consensus in the field for some time that incentives offer distinct advantages as regulatory tools over traditional command-and-control regulatory standards,⁵³ at least when combined with standards into a composite or hybrid system, in which regulatory standards establish minimum requirements and an added layer of incentives encourages polluters to innovate and go beyond the minimum required by law.⁵⁴ Similarly, there is a strong and growing consensus that redesigning processes to prevent pollution, rather than cleaning it up afterwards with end-of-pipe controls, is cheaper and more efficient in many instances.⁵⁵ The PCEQ-TQM Report provides interesting and valuable case studies that support these familiar propositions, but where the report makes its own unique and original contribution is in

reduce their emissions of selected toxics into the environment by almost 83%, or 9.5 million pounds, by December 1993).

51. SHABECOFF, *supra* note 3, at 133.

52. See, e.g., John Holusha, *Environmentalists Try To Move the Markets*, N.Y. TIMES, Aug. 22, 1993, § 4, at 5.

53. Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333 (1985); Robert W. Hahn & Robert N. Stavins, *Incentive-Based Environmental Regulation: A New Era From An Old Idea?*, 18 ECOLOGY L.Q. 1 (1991); Colloquy, *supra* note 41.

54. See *supra* note 34.

55. See generally Pollution Prevention Act of 1990, Pub. L. No. 101-508, tit. VI, subtit. F, §§ 6601-6610, 104 Stat. 1388, 1388-321 to -327 (1990) (codified at 42 U.S.C. §§ 13101-13109 (Supp. III 1991)).

linking pollution prevention with the techniques of Total Quality Management.

TQM is an approach to analyzing and managing complex organizations developed by the late W. Edwards Deming. A statistician by training, Deming emphasized the design and continuous improvement of systems to increase quality, which he insisted could be measured and defined as satisfying the needs of the customer.⁵⁶ One of Deming's central premises was that problems are caused, not by workers, but by the design of the system, and that it is everyone's job to improve continuously — to invent and reinvent — the system's design.⁵⁷ In addition, Deming maintained that it was impossible to ensure the quality of a product by an inspection at the end of the production line; rather, quality had to be designed and built into the product at every step of the production process.⁵⁸ Deming's ideas were particularly influential in postwar Japan, which adopted many of his principles and in 1951 established the Deming Prize as Japanese industry's most prestigious award. In recent years, many U.S. companies have adopted Deming's principles. Building on the pioneering work of the Global Environmental Management Initiative,⁵⁹ many U.S. companies have also found Deming's ideas particularly useful for reducing pollution.⁶⁰

The PCEQ-TQM Report is especially helpful in explaining in concrete terms how to use TQM tools to develop an effective pollution prevention program. A short appendix to the report (app. D) explains in clear, accessible terms how to use five basic TQM tools — the fishbone diagram, the control chart, the histogram, the Pareto chart, and the flow chart — and how to adapt them to analyze and eliminate sources of pollution (pp. 95-102). Moreover, the experiences of the eleven companies at twelve different sites described in the PCEQ-TQM Report (app. B) sites prove that TQM works.

56. Numerous books, articles, lectures, and even a PBS television program are now available about Dr. Deming's "Total Quality Management" philosophy. Two widely available references are RAFAEL AGUAYO, *DR. DEMING: THE AMERICAN WHO TAUGHT THE JAPANESE ABOUT QUALITY* (1990), and MARY WALTON, *THE DEMING MANAGEMENT METHOD* (1986). Deming himself wrote two books on his management methods: W. EDWARDS DEMING, *OUT OF THE CRISIS* (1986), and W. EDWARDS DEMING, *QUALITY, PRODUCTIVITY, AND COMPETITIVE POSITION* (1982). Two expositions of basic TQM principles are now available in the legal literature: Elliott, *supra* note 16, and Paul R. Verkeil, *Reverse Yardstick Competition: A New Deal for the Nineties*, 45 U. FLA. L. REV. 1 (1993).

57. See WALTON, *supra* note 56, at 66-67; Elliott, *supra* note 16 at 175-76.

58. See WALTON, *supra* note 56, at 60; Elliott, *supra* note 16, at 177.

59. GLOBAL ENVTL. MANAGEMENT INITIATIVE, *CORPORATE QUALITY/ENVIRONMENTAL MANAGEMENT: THE FIRST CONFERENCE — PROCEEDINGS* (1991). GEMI is generally credited with being the first to see the relationship between TQM and pollution prevention.

60. See Emily T. Smith, *Doing It for Mother Earth*, BUS. WK., Oct. 25, 1991, at 44, 44 ("By linking quality and environmental goals, companies from Xerox and Procter & Gamble to Allied-Signal and IBM have found that they can cut pollution and improve compliance, often while lowering their environmental costs.")

“Pollution prevention pays” has become a popular slogan in some quarters recently. The PCEQ-TQM Report finds that while not every pollution prevention effort ends up saving money, many do.⁶¹ As former EPA administrator William K. Reilly was fond of saying — with apologies to Wordsworth — “A pollutant is just a resource in the wrong place.”

61.

The financial incentives for applying TQM to pollution prevention can be significant. Several of the companies involved in the demonstration projects showed cost savings after the implementation of a QEM system. For example, successful solid waste minimization efforts at Procter & Gamble's Mehoopany plant are yielding a total value of \$25,000,000 per year.

GE found that substituting floor wax for a freon-based mold release saved approximately \$15,000. By year end, the company estimates that 1,1,1 trichloroethane use will be decreased by 95 percent, saving approximately \$30,000. The introduction of a closed-loop cooling system and three process changes has reduced water consumption by 300,000 gallons/week with estimated annual savings on water and sewage costs of approximately \$30,000.

DuPont noted that when its project first began, costs were seen as a barrier, yet the results are an incentive for future programs. Initially, DuPont believed that reducing excess ammonia would cost them money; however, the project has saved approximately \$1,000,000 a year in manufacturing costs and reduced ammonium sulfate generation by 60,000,000 pounds/year. The savings are a result of decreased expenditures on raw materials and decreased waste disposal taxes.

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