

# The Impracticality and Immorality of Cost-Benefit Analysis in Setting Health-Related Standards

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That is the issue that will continue in this country when these poor tongues of Judge Douglas and myself shall be silent. It is the eternal struggle between these two principles—right and wrong—throughout the world. They are the two principles that have stood face to face from the beginning of time; and will ever continue to struggle. The one is the common right of humanity, and the other the divine right of kings. It is the same principle in whatever shape it develops itself. It is the same spirit that says “You toil and work and earn bread, and I’ll eat it.” No matter in what shape it comes, whether from the mouth of a king who seeks to bestride the people of his own nation and live by the fruit of their labor, or from one race of men as an apology for enslaving another race, it is the same tyrannical principle.

Abraham Lincoln, 1858<sup>1</sup>

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1. JOHN BARTLETT, FAMILIAR QUOTATIONS 636 (Emily Morison Beck ed., Little Brown 14th ed. 1968).

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I. INTRODUCTION

Of the many provisions of American environmental law ever enacted, perhaps the most significant, and surely one of the most controversial, is the requirement that ambient air quality standards be based solely on the protection of public health.<sup>2</sup> “[A]ttempting to cope with air pollution by using health or environmental effects as the sole determinant of national policy,” wrote one former Republican Administrator of the Environmental Protection Agency, William D. Ruckelshaus, “is inherently irrational.”<sup>3</sup>

Ruckelshaus’s language is surprisingly harsh given his reputation, perhaps undeserved, as a moderate.<sup>4</sup> It is especially so, considering that basing standards on protection of human health was so noncontroversial when enacted only a decade earlier that major industrial groups endorsed the approach. “[S]ociety has a responsibility to protect the more vulnerable segments of its population,” testified the Manufacturing Chemists Association, then the Washington, D.C.-based representative of the U.S. chemical industry.<sup>5</sup> Others supporting health-based ambient standards included the coal industry.<sup>6</sup>

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2. Clean Air Act § 109(b), 42 U.S.C. § 7409(b) (1994).

3. Letter from William D. Ruckelshaus, Administrator, EPA, to Vice President George H. Bush 3 (June 18, 1981) (on file with author) [hereinafter Ruckelshaus June Letter]. Ruckelshaus was among those who saw repeal of health-based primary standards as the keystone of regulatory reform, saying the outcome of the struggle over clean air would prove “crucial to the ultimate success of your deregulation efforts.” In an earlier letter, Ruckelshaus urged newly elected Vice President George Bush to “construct a program for regulatory reform” for the purpose of achieving “fundamental change in laws like the Clean Air Act.” Letter from William D. Ruckelshaus, Administrator, EPA, to Vice President George H. Bush (Jan. 30, 1981) (on file with author).

4. See David S. Broder & Jonathan Freedland, *Moderates Looking Beyond Bush*, WASH. POST, Aug. 19, 1992, at A21.

5. SENATE COMM. ON PUBLIC WORKS, 93RD CONG., A LEGISLATIVE HISTORY OF THE CLEAN AIR AMENDMENTS OF 1970, at 751 (Comm. Print 1974) [hereinafter 1990 LEGIS. HIST.].

6. See *Acid Rain, 1984: Hearings on S.768 Before the Senate Comm. on Environment and Public Works*, 98th Cong. 260 (1984) (statement of Carl Bagge, President, National Coal Association).

Nevertheless, the Clean Air Act's (CAA or the Act) requirement that ambient air quality standards be based solely on protection of health<sup>7</sup> is arguably the single most objectionable provision of environmental law to the nation's corporations and their supporters. This is partially because the provision is important in and of itself, but also because the CAA generally—and health-based standards specifically—have acquired a symbolic importance. To many, the division over whether standards should be based on health or on cost is the contemporary equivalent of the schism described 120 years ago by Abraham Lincoln. It is important, therefore, to examine not only the workability of alternatives to health-based standards in the technical context of air pollution and its control, but their moral implications as well, especially in the context of a democracy that views itself as being based on “values.”

## II. CRITICS OF HEALTH-BASED CLEAN AIR STANDARDS

The criticisms of health based standards have a sameness to them, because its critics tend to echo one another. It is likely, therefore, that elsewhere in this issue there will be complaints similar to those found in the Fall 1997, issue of *Resources*, a publication of the industry-leaning resources for the Future. That article, written by J.W. Anderson, a member of the editorial page of *The Washington Post*, perpetuates falsehoods and misconceptions about ambient standards that have been repeated so often that they are widely accepted as true. These include the following: “When written in 1970, the act was based on the assumption that each pollutant has a threshold below which it has no effect on human health.”<sup>8</sup>

This is simply wrong. Congress knew full well that there was no threshold for some pollutants because health scientists told them so. Consider the following exchange between Dr. John Middleton, then Administrator of the National Air Pollution Control Administration, which was a predecessor of the Environmental Protection Agency (EPA or the Agency), and former Senator Howard Baker (R-TN). Dr. Middleton was asked whether it might be possible to identify a “no-known-effects” level for sulphur dioxide. He responded that:

To identify a no-known-effects level is something that would be, in my opinion, not only extremely difficult but very likely not possible.

The question raised is whether the national air quality standard could be at a no-effects level. Yes, it could be set at a no-effects level, but I could not tell you where that level would be, because the knowledge that we have

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7. See CAA § 109(a), (b)(1), 42 U.S.C. § 7409(a), (b)(1) (1994).

8. J.W. Anderson, *New Air Quality*, *RESOURCES*, Fall 1997, at 6, 7.

shows there is not any single level where something either begins or stops. There are a series of things taking place. Two things happen: The state of our knowledge is always in flux, improvement, and secondly, it is not that simple a decision, because the causes of destruction of lung tissue, as an example, may be the end result of a series of biochemical effects that occurred earlier and that may be difficult to detect under average observation conditions.

So, Senator Baker, it is that series of events which makes it, I would say, virtually impossible to state quite forthrightly that there is a no-effects level . . . as science progresses, it is very likely we are going to find still other body chemical systems that are being affected, so the no-effect level always corresponds, you might say, to the limitations of scientific knowledge in this area.<sup>9</sup>

Critics also contend that standards based solely on protection of human health provide “protection for unusually sensitive people who

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9. 1990 LEGIS. HIST., *supra* note 5, at 1184-85. The complete dialogue was:

*Dr. Middleton.* To identify a no-known-effects level is something that would be, in my opinion, not only extremely difficult but very likely not possible.

The question raised is whether the national air quality standard could be at a no-effects level. Yes, it could be set at a no-effects level, but I could not tell you where that level would be, because the knowledge that we have shows there is not any single level where something either begins or stops. There are a series of things taking place. Two things happen: The state of our knowledge is always in flux, improvement, and secondly, it is not that simple a decision, because the causes of destruction of lung tissue, as an example, may be the end result of a series of biochemical effects that occurred earlier and that may be difficult to detect under average observation conditions.

So, Senator Baker, it is that series of events which makes it, I would say, virtually impossible to state quite forthrightly that there is a no-effects level.

To resolve this largely intellectual conundrum of how to set a level that is protective of health when such a level might not exist, Dr. Middleton offered the following:

*Dr. Middleton.* The criteria documents state the level at which effects begin, some measurable things that are observed to take place. The Clean Air Act provides that the standards shall be protective of health, which means they must be lesser than the level at which this thing was observed.

In addition, we say that a margin of safety must be included. What the margin of safety is to be is always debatable. Some people say it ought to be 10 times less than the minimum observed effect level; others have different views. That is part of the problem we can't skip over in saying that there is a no-effects level.

*Senator Muskie.* But there is a no-effects area?

*Dr. Middleton.* We know from the criteria published for sulfur oxides, that at certain levels definite adverse effects occur in the lung. We also know that at a little lower level there are more subtle effects on the action of the lung, and that below that some enzyme systems begin to fail or to function improperly.

The no-effect level would have to be somewhere below that, but as science progresses, it is very likely we are going to find still other body chemical systems that are being affected, so the no-effect level always corresponds, you might say, to the limitations of scientific knowledge in this area.

*Id.*

experience distress at lower concentrations than the population as a whole.”<sup>10</sup> Again, this is simply untrue.

Are children at play “unusually sensitive”? Pregnant women? Postal workers? Most people would not consider these groups “unusually sensitive,” but they are nevertheless examples of sensitive populations protected by ambient standards.<sup>11</sup>

The eight-hour ozone standard proposed by the Administrator was based in part on chamber studies and in part on population studies.<sup>12</sup>

10. Anderson, *supra* note 8, at 8.

11. Sensitive Populations:

Pollutant	Sensitive Population	Percentage of Total U.S. Population	Number of Persons in Sensitive Population
Ozone	Those with respiratory disease	5.1-11.2 percent	13,820,000
	Elderly	12.7 percent	32,284,000
	Pre-adolescents	20.6 percent	52,517,000
	Those exercising (e.g. jogging)	4.7-23.8 percent	10.8 to 54.6 million
	“Responders” (5 to 20 percent of the “normal” population)	5 to 20 percent	12.8 to 51.0 million
Sulfur dioxide	Those with respiratory disease	5.1-11.2 percent	13,820,000
	Elderly	12.7 percent	32,284,000
	Pre-adolescents	20.6 percent	52,517,000
Carbon monoxide	Pregnant women	1.6 percent	4,010,000
	Those with ischemic coronary disease (e.g. angina)	2.8 percent	7,160,000
Lead	Children under 5	7.6 percent	19,512,000
	Pregnant women	1.6 percent	4,010,000
Particulate (PM <sub>10</sub> )	Those with respiratory disease	5.1-11.2 percent	13,820,000
	Elderly	12.7 percent	32,284,000
	Pre-adolescents	20.6 percent	52,517,000
Nitrogen dioxide	Those with respiratory disease	5.1-11.2 percent	13,820,000
	Pre-adolescents	20.6 percent	52,517,000

DEPARTMENT OF HEALTH AND HUMAN SERVICES, CENTERS FOR DISEASE CONTROL, PUBLIC HEALTH SERVICE, VITAL STATISTICS: CURRENT ESTIMATES FROM THE NATIONAL HEALTH INTERVIEW SURVEY 1993 (1994).

12. These controlled studies of acute responses used exposure protocols mimicking ozone season patterns “(exposures of 6 to 8 hours duration to O<sub>3</sub> concentrations of 0.08 to 0.12 ppm with intermittent exercise throughout the exposure period). Statistically significant, progressive decrements in mean FEV<sub>1</sub> have been demonstrated in healthy, young men exposed for 6.6 hours to as little as 0.08 ppm during exercise to achieve a minute ventilation of approximately 40 L/min for 5 hours.” Committee of the Environmental and Occupational Health

Those exposed to ozone in chambers were healthy, nonsmoking, male college students.<sup>13</sup> They experienced statistically significant, progressive decrements in measures of normal lung function.<sup>14</sup> The population studies focused on normal, otherwise healthy children and young adults spending time in outdoor settings, especially summer camps.<sup>15</sup> These children were not cripples, asthmatics, or bronchitics.<sup>16</sup> Similarly, in the studies of the health effects of fine particles relied upon for that proposal, most were epidemiologic studies of normal populations—for example, of Philadelphia—not sensitive groups or vulnerable individuals.<sup>17</sup>

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Assembly of the American Thoracic Society, *State of the Art Review: Health Effects of Outdoor Air Pollution*, 153 AM. J. RESPIR. CRIT. CARE MED. 3, 17 (1996) [hereinafter *American Thoracic Society*] (citing D.H. HORSTMAN, CHANGES IN PULMONARY FUNCTION AND AIRWAY REACTIVITY DUE TO PROLONGED EXPOSURE TO TYPICAL AMBIENT OZONE LEVELS. ATMOSPHERIC OZONE RESEARCH AND ITS POLICY IMPLICATIONS: PROCEEDINGS OF THE 3RD US-DUTCH INTERNATIONAL SYMPOSIUM; MAY 1988; NIJMEGEN, THE NETHERLANDS 755-62 (T. Schneider et al. eds. 1989)); see also D.H. Horstman et al., *Ozone Concentration and Pulmonary Response Relationships for 6.6 hr Exposures With 5 hr of Moderate Exercise to 0.08, 0.10 and 0.12 ppm*, 142 AM. REV. RESPIR. DIS. 1158 (1990). “For example, Horstman et al. exposed subjects at 0.08 and 0.10 ppm ozone, and found a decrease in FEV1 of 11.4 percent at .10 and 8.4 percent at 0.08 ppm.” EPA, OFFICE OF RESEARCH AND DEVELOPMENT, AIR QUALITY CRITERIA FOR OZONE 7-56 (1996). “When exposed to 0.08 and 0.10 ppm ozone under the EPA prolonged exposure protocol, all of the subjects had increased levels of PMNs and IL-6, which are signals of inflammation and indicators of increased susceptibility to infection. There were also increases in fibronectin and PGE2. Alveolar macrophages removed both groups had decreased ability to consume *Candida albicans*.” *Id.* at 7-75.

13. See EPA, OFFICE OF RESEARCH AND DEVELOPMENT, AIR QUALITY CRITERIA FOR OZONE 7-75 (1996).

14. See *id.*

15. See *American Thoracic Society*, *supra* note 12, at 18.

16. See B. Brunekreef et al., *Epidemiologic Studies on Short-Term Effects of Low Levels of Major Ambient Air Pollution Components*, 103 ENVTL. HEALTH PERSPECTIVES 3, 4 (1995).

Spektor et al. [for example] studied the relationship between ozone exposure and lung function changes in normal children participating in a summer camp. Ozone concentrations never exceeded .12 ppm (240  $\mu\text{g}/\text{m}^3$ ). The lung function indices forced vital capacity (FVC), forced expiratory volume in 1 sec (FEV1), peak expiratory flow (PEF), and maximum mid expiratory flow (MMEF)—were all significantly and negatively associated with the ozone concentration in the hour preceding the lung function test. Notably, these results did not change when ozone concentrations exceeding 120 or 160  $\mu\text{g}/\text{m}^3$  were excluded from the analysis . . . . In another summer camp study, Spektor et al. found results essentially the same as those obtained earlier.

*Id.* (citing D.M. Spektor et al., *Effects of Ambient Ozone on Respiratory Function in Active, Normal Children*, 137 AM. REV. RESPIR. DIS. 313 (1988)).

17. See EPA, OFFICE OF RESEARCH AND DEVELOPMENT, AIR QUALITY CRITERIA FOR PARTICULATE MATTER 12-115 (1996) [hereinafter PM CRITERIA DOCUMENT].

For example, Ransom and Pope (1992) studied elementary school absences in connection with the steel strike in the Utah Valley. Data for school absences from 1985 to 1991 were obtained from two sources: (1) district-wide attendance averages by grade level from the Provo School District, and (2) daily absenteeism records from the Northridge Elementary School in Orem. A highly significant increase of about 2% in the absence rates (absolute increase) for an increase of 100  $\mu\text{g}/\text{m}^3$  increase in the 4-

Critics also charge that “the statute is pushing the standards down to background levels. . . .”<sup>18</sup> Yet, can there be a “background” for pollutants that do not exist naturally? This is the case with fine particles (PM<sub>2.5</sub>), which are almost wholly created by combustion and related processes.<sup>19</sup> Only the larger particles are of crustal or geologic origin, for which there would be a natural background.<sup>20</sup> Similarly, the ozone standard proposed and adopted by the Administrator is 0.08 parts-per-million (ppm) over an eight-hour period.<sup>21</sup> While it is true that ozone occurs “naturally”—that is, in the absence of humans—that level is believed to be 0.03 to 0.04 ppm, perhaps as low as 0.01 ppm.<sup>22</sup> Adverse health effects have been found above 0.04 ppm, but not at 0.04.<sup>23</sup> Ozone levels of 0.08 are indeed encountered even in rural settings, but they are that high only because of human activity and not, therefore, “natural” background.<sup>24</sup>

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week average PM<sub>10</sub> was found for both sets of data, and the coefficient was similar even when a dummy variable was added for the strike.

*Id.* (citations omitted).

Brunekreef et al. (1991) further analyzed data from Dockery et al. (1982) on pulmonary function in children in Steubenville, Ohio as part of the Harvard Six-Cities Study. Linear decreases in forced vital capacity (FVC) with increasing TSP concentrations were found . . . .

*Id.* at 12-126 (citations omitted).

18. Anderson, *supra* note 8, at 8.

19. See PM CRITERIA DOCUMENT, *supra* note 17, at 11-102. Indeed, the primary argument advanced for moving exclusively to a focus on finer particles was that larger particulate matter tends to be of “geologic” or “crustal” origin and, hence, less toxic than PM<sub>2.5</sub>. Although the composition of the fine particle fraction is very complex, studies in the United States indicate that it contains sulfate; ammonium and hydrogen ions; and, elemental carbon and secondary organic carbon. A variety of metals are also present, including cadmium, vanadium, titanium, and iron. See *id.*

20. See *id.*

21. See National Ambient Air Quality Standards for Ozone: Proposed Decision, 61 Fed. Reg. 65,716 (1996) (to be codified at 40 C.F.R. pt. 50).

22. See A. Volz & D. Kley, *Evaluations of the Montsouris Series of Ozone Measurements in the Nineteenth Century*, 332 NATURE 240 (1988). From 1876 to 1910 measurements of atmospheric ozone concentrations were measured at Montsouris, France, which is near Paris. These measurements were reanalyzed by Volz and Kley using the same techniques as the original researchers. Their analysis showed that surface ozone concentrations near Paris 100 years ago averaged about 10 parts per billion. Current concentrations in the most unpolluted areas of Europe average 20 and 45 ppb. This doubling of tropospheric ozone concentrations is “as remarkable as the observation of a hole in the stratospheric ozone layer over the Antarctic and potentially is just as consequential.” *Id.* See also COMMITTEE ON TROPOSPHERIC OZONE FORMATION AND MEASUREMENT, NATIONAL RESEARCH COUNCIL, RETHINKING THE OZONE PROBLEM IN URBAN AND REGIONAL AIR POLLUTION 19-23 (1991).

23. See *American Thoracic Society*, *supra* note 12, at 26. “Analysis of pulmonary function data from the National Health and Nutrition Examination Survey (NHANES II) showed ambient O<sub>3</sub> concentration to be associated with loss of lung function where annual ambient averages were above 0.04 ppm . . . .” *Id.*

24. See Volz & Kley, *supra* note 22, at 42.

Untroubled by these facts, critics conclude that “the present language of the statute is pushing the standards down . . . [to] the point where they will become unenforceable and merely aspirational.”<sup>25</sup> This criticism is based on the fact that once health-based standards are adopted, costs must then be taken into account in setting deadlines and developing control programs.<sup>26</sup> As a result, dates for attaining the ambient standards are pushed far into the future and become uncertain of attainment.<sup>27</sup> In

25. Anderson, *supra* note 8, at 8.

26. *See id.* Many provisions of the CAA expressly require costs to be taken into account. *See, e.g.*, CAA § 111, 42 U.S.C. § 7411 (new source performance standards); CAA § 202(i)(3)(B), 42 U.S.C. § 7521(i)(3)(B) (new light duty vehicle emission standards); and CAA § 112(d)(2), 42 U.S.C. § 7412(d)(2) (maximum achievable control technology for hazardous air pollutants).

27. The 1990 CAA Amendments appear to have merely extended the attainment dates for areas as outlined in Table I. The Amendments set six deadline categories for ozone nonattainment areas, based on air quality, expressed as the EPA “design value” (essentially the fourth most unhealthy ozone day in the previous three years):

Table I: Ozone Smog Requirements

	Design Value (ppm)	Attainment Date
Marginal	0.121 to 0.138	Nov. 15, 1993
Moderate	0.138 to 0.160	Nov. 15, 1996
Serious	0.160 to 0.180	Nov. 15, 1999
Severe I	0.180 to 0.190	Nov. 15, 2005
Severe II	0.190 to 0.280	Nov. 15, 2007
Extreme	0.280 and above	Nov. 15, 2010

CAA § 181(a), 42 U.S.C. § 7511(a)(1) (1994).

Table II: PM<sub>10</sub> Requirements

Area Classification	Attainment Date
Moderate—Initially All Areas	Dec. 31, 1994
Serious—Areas Unable to Attain by Dec. 31, 1994	Dec. 31, 2001

CAA § 188(c), 42 U.S.C. § 7513(c).

The nation’s 41 carbon monoxide nonattainment areas (as of 1989) are divided into two categories, based on the severity of the problem, according to Table III.

Table III: Carbon Monoxide Requirements

	Design Value (parts per million)	Attainment Date
Moderate	9.1 to 16.4	December 31, 1995
Serious	16.5 and above	December 31, 2000

CAA § 186(a)(1), 42 U.S.C. § 7512(a)(1). In reality, there is no longer any fixed date by which the standards must be met because the 1990 CAA Amendments create a series of self-extending attainment dates. The mechanism is rather complex but quite ingenious.

The attainment date set by Section 172(a)(2) is “the date by which attainment can be achieved as expeditiously as practicable, but no later than five years from the date such area was designated nonattainment under Section 107(d), except that the Administrator may extend the attainment date . . . for a period no greater than ten years . . .” CAA § 172(a)(2), 42 U.S.C. § 7502(a)(2). Thus, the law appears to establish a firm deadline. This impression is confirmed by congressional statements to that effect. For example, the Senate Committee described the program as follows: “Depending on the severity of the pollution problem, nonattainment areas



other words, according to critics, the delays engendered by taking costs into account become so great that there should be no need to even pretend that public health is being protected. This Kafkaesque reasoning might make sense if the health effects involved were minor. They are not minor at all.

### III. HEALTH EFFECTS OF PARTICULATES AND OZONE

#### A. *Particulates*

A large body of compelling evidence demonstrates that particulate matter is associated with early and unnecessary deaths, aggravation of heart and lung diseases, reduction in the ability to breathe normally, and increases in respiratory illnesses, leading to school and work absences.<sup>28</sup> As particulate levels rise, so do runny or stuffy noses, sinusitis, sore throat, wet cough, head colds, hayfever, burning or red eyes, wheezing, dry cough, phlegm, shortness of breath, and chest discomfort or pain, as

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for any of the pollutants must attain the health standard within (the specified number of years) for ozone.” However, an area failing to attain the standard by the applicable date is subject to Section 179(d), “Consequences” is described in paragraph (3), which provides that:

(3) The attainment date applicable to the revision required under paragraph (1) shall be the same as provided in the provisions of section 172(a)(2), except that in applying such provisions the phrase “from the date of notice under section 179(c)(2)” shall be substituted for the phrase “from the date such area was designated nonattainment under section 107(d)” and for the phrase “from the date of designation as nonattainment.”

CAA § 179(d)(3), 42 U.S.C. § 7509(d)(3). Thus, for areas failing to meet their deadlines, Section 172(a)(2), with the substitutions required by Section 179(d)(3), reads as follows:

(2) Attainment dates for nonattainment areas

The attainment date for an area designated nonattainment with respect to a national primary ambient air quality standard shall be the date by which attainment can be achieved as expeditiously as practicable, but no later than five years from the date of the notice under section 7407(d), except that the Administrator may extend the attainment date to the extent the Administrator determines appropriate, for a period of no greater than ten years from the date of the notice under section 179(c)(2), considering the severity of nonattainment and the availability and feasibility of pollution control measures.

CAA § 172(a)(2), 42 U.S.C. § 7502(a)(c). Because the number of such automatic extensions is unlimited, there is never a fixed date by which the public can be assured the air will meet the health-based standards. See Curtis A. Moore, *The 1990 Clean Air Act Amendments: Silk Purse or Sow's Ear?* 2 DUKE ENVTL. L. & POL'Y F. 26, 58 (1992).

28. See *American Thoracic Society*, *supra* note 12, at 31. “Survival analysis of mortality from a 14 to 16 year follow-up of 8,111 adults participating in the Harvard Six Cities Study showed increased city-specific mortality rates after adjusting for individual risk factors. Adjusted mortality appeared to increase most consistently with fine particle concentrations (<2.5 µm aerodynamic diameter) with a 26% increased risk for total mortality across the range of mean fine particle exposure (11 to 29.6 µg/m<sup>3</sup>), and 37% for cardiopulmonary mortality. These observed associations were not explained by personal smoking, occupational exposures, or history of chronic disease.” *Id.*

well as hospital admissions for asthma and bronchitis.<sup>29</sup> Studies have shown that chronic cough, asthma, and emphysema rise among nonsmoking Seventh-Day Adventists;<sup>30</sup> bronchitis and chronic cough increase in school children<sup>31</sup> as do emergency room and hospital admissions.<sup>32</sup> In Utah, when particulate levels rose, hospital admissions of children for respiratory illnesses tripled.<sup>33</sup> Acute respiratory symptoms and/or illness have also been associated with particulate air pollution in six eastern towns, in adults in 63 cities, and in two Swiss cities.<sup>34</sup>

In plain terms, at levels commonly encountered, particulate pollution kills and disables Americans, especially children, the elderly, and those who are ill.

### B. Ozone

Recent studies have also found ozone to be associated with daily mortality in Belgium,<sup>35</sup> Amsterdam,<sup>36</sup> and London.<sup>37</sup> Two more studies demonstrating an association between ozone and mortality, one in Brisbane<sup>38</sup> and the other in Rotterdam,<sup>39</sup> have been submitted for publication.

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29. See D.W. Dockery & C. A. Pope, III, *Acute Respiratory Effects of Particulate Air Pollution*, 15 ANN. REV. PUB. HEALTH 107, 122 (1994).

30. See G.L. Euler et al., *Chronic Obstructive Pulmonary Disease Symptom Effects of Long Term Cumulative Exposure to Ambient Levels of Total Suspended Particulates and Sulfur Dioxide in California Seventh-Day Adventist Residents*, 42 ARCH. ENVTL. HEALTH 213, 214 (1987).

31. See J. Ware et al., *Effect of Ambient Sulfur Oxides and Suspended Particles on Respiratory Health of Preadolescent Children*, 133 AM. REV. RESPIR. DIS. 834 (1986); D.W. Dockery et al., *Effects of Inhalable Particles on Respiratory Health of Children*, 139 AM. REV. RESPIR. DIS. 587 (1989).

32. See D.V. Bates et al., *Air Pollution and Hospital Admissions in Southern Ontario: The Acid Summer Haze Effect*, 43 ENVTL. RES. 317, 328 (1987); J.M. Samet et al., *The Relationship between Air Pollution and Emergency Room Visits in an Industrial Community*, 31 J. AIR. POLLUT. CONTROL ASS'N 236 (1981).

33. See J. Gross et al., *Monitoring of Hospital Emergency Room Visits as a Method for Detecting Health Effects of Environmental Exposures*, 32 SCI. TOTAL ENVTL. 289 (1984).

34. See Joel Schwartz, *Air Pollution and Daily Mortality: A Review and Meta Analysis*, 64 ENVTL. RES. 36, 50 (1994).

35. See F. Sartor et al., *Temperature, Ambient Ozone Levels, and Mortality during Summer, 1994, in Belgium*, 70 ENVTL. RES. 105 (1995).

36. See A. Verhoeff et al., *Air Pollution and Daily Mortality in Amsterdam*, 7 EPIDEM. 225 (1996).

37. See H. Ross Anderson et al., *Air Pollution and Daily Mortality in London: 1987-92*, 312 BMJ 665 (1996).

38. See R.W. Simpson et al., *The Association Between Outdoor Air Pollution and Daily Mortality in Brisbane, Australia*, ARC. ENVTL. HEALTH (Submitted 1997).

39. See G. Hoek et al., *Effects of Ambient Particulate Matter and Ozone on Daily Mortality in Rotterdam, the Netherlands*, ARC. ENVTL. HEALTH (Submitted 1997).

Even without these recent studies, however, it is clear that the impacts of ozone exposure are grave. The body of evidence that ozone causes chronic, pathologic lung damage is overwhelming. At levels routinely encountered in most American cities, ozone burns through cell walls in lungs and airways,<sup>40</sup> tissues redden and swell,<sup>41</sup> cellular fluid seeps into the lungs,<sup>42</sup> and over time their elasticity drops.<sup>43</sup> Macrophage cells rush to the lung's defense, but they too are stunned by the ozone.<sup>44</sup> Susceptibility to bacterial infections increases, possibly because ciliated cells that normally expel foreign particles and organisms have been killed and replaced by thicker, stiffer, nonciliated cells.<sup>45</sup> Scars and lesions form in the airways.<sup>46</sup> At ozone levels that prevail through much of the year in California and other warm-weather cities, healthy, nonsmoking young men who exercise can't breathe normally.<sup>47</sup> Breathing is rapid, shallow, and painful.<sup>48</sup>

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40. See E.S. Schelegle et al., *Time Course of Ozone-induced Neutrophilia in Normal Humans*, 143 AM. REV. RESPIR. DIS. 1353 (1991).

41. See *id.*

42. See D.E. Graham et al., *Neutrophil Influx Measured in Nasal Lavages of Humans Exposed to Ozone*, 43 ARCH. ENVTL. HEALTH 228 (1988); see also D.E. Graham et al., *Biomarkers of Inflammation in Ozone-Exposed Humans*, 142 AM. REV. RESPIR. DIS. 152 (1990); R. Bascom et al., *Effect of Ozone Inhalation on the Response to Nasal Challenge with Antigen of Allergic Subjects*, 142 AM. REV. RESPIR. DIS. 594 (1990); C.E. Smith et al., *Mast Cell Tryptase is Increased in Nasal and Bronchial Alveolar Lavage Fluids of Humans after Ozone Exposure*, 5 INHALATION TOXICOL. 117 (1993).

43. See Martin Lippman, *Health Effects of Ozone: A Critical Review*, 39 J. AIR POLLUT. CONTROL ASS'N 672, 672-95 (1985); see also H.S. Van Loveren et al., *Effects of Ozone on the Defense to a Respiratory Listeria Monocytogenes Infection in the Rat, Suppression of Macrophage Function on Cellular Immunity and Aggravation of Histopathology in Lung and Liver During Infection*, 94 TOXICOL. APPL. PHARMACOL. 374, 374-93 (1988); D. E. Gardner, *Use of Experimental Airborne Infections for Monitoring Altered Host Defenses*, 43 ENVTL. HEALTH PERSP. 99, 99-107 (1982); M.I. Gilmour et al., *Ozone-enhanced Pulmonary Infection with Streptococcus Zooepidemicus in Mice: The Role of Alveolar Macrophage Function and Capsular Virulence Factors*, 147 AM. REV. RESPIR. DIS. 753, 753-60 (1993); M.I. Gilmour & M.K. Selgrade, *A Comparison of the Pulmonary Defenses Against Streptococcal Infection in Rats and Mice Following O<sub>3</sub> Exposure: Differences in Disease Susceptibility and Neutrophil Recruitment*, 123 TOXICOL. APPL. PHARMACOL. 211, 217 (1993); J.R. Harkema et al., *Response of the Macaque Nasal Epithelium to Ambient Levels of Ozone: A Morphological and Morphometric Study of the Transitional and Respiratory Epithelium*, 128 AM. J. PATHOL. 129 (1987).

44. See R. B. Devlin et al., *Exposure of Humans to Ambient Levels of Ozone for 6.6 Hours Causes Cellular and Biochemical Changes in the Lung*, 4 AM. J. RESPIR. CELL. MOLEC. BIOL. 72, 72-81 (1991); see also S.D. Harder et al., *Inhibition of Human Natural Killer Cell Activity Following In Vitro Exposure to Ozone*, 2 INHAL. TOXICOL. 161, 161-73 (1990).

45. See Van Loveren et al., *supra* note 43, at 374. See also Gardner, *supra* note 43, at 99.

46. See EPA, OFFICE OF RESEARCH AND DEV., EXECUTIVE SUMMARY: AIR QUALITY CRITERIA FOR OZONE AND RELATED PHOTOCHEMICAL OXIDANTS (1996) [hereinafter OZONE CRITERIA DOCUMENT].

47. See W.F. McDonnell et al., *Pulmonary Effects of Ozone Exposure During Exercise: Dose Response Characteristics*, 54 J. APPL. PHYSIOL. 1345 (1983).

48. See generally *id.*

As ozone levels rise, hospital admissions and emergency department visits do the same.<sup>49</sup> In some laboratory animals, cancers appear.<sup>50</sup> Children at summer camp lose the ability to breathe normally as ozone levels rise, even when the air is clean by reference to the former federal standard, and these losses continue for up to a week.<sup>51</sup>

Still, critics such as William Ruckelshaus assert that it is “inherently irrational” to base standards on protection of human health, typically arguing in favor of using a cost-benefit analysis.<sup>52</sup> This, they argue, would optimize societal expenditures of a scarce resource; namely, money.<sup>53</sup>

This is an appealing argument. Except for the rich (and probably even they feel pinched on occasion), money is indeed scarce. Certainly, I’d like more. (Whether it should be a subsidy provided by the lives and health of others is another matter, however.)

But does achieving ambient standards based on health really cost billions of dollars? For that matter, does it cost any money at all? If so, can those costs be predicted accurately enough in advance to conduct a cost-benefit analysis?

#### IV. THE NEAR IMPOSSIBILITY OF CALCULATING COSTS

Proponents of cost-benefit analysis assert, and many people accept without challenge, that the costs of complying with environmental requirements can be calculated fairly easily.<sup>54</sup> Yet, experience for a quarter century demonstrates that calculating cost can be every bit as

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49. See OZONE CRITERIA DOCUMENT, *supra* note 46, at 1-26. See also Patrick L. Kinney & Haluk Ozkaynak, *Associations of Daily Mortality and Air Pollution in Los Angeles County*, 54 ENVTL. RES. 99 (1991); Patrick L. Kinney & Haluk Ozkaynak, *Associations Between Ozone and Daily Mortality in Los Angeles and New York City*, 145 AM. REV. RESPIR. DIS. A95 (1992).

50. See OZONE CRITERIA DOCUMENT, *supra* note 46, at 1-21.

51. See generally Patrick L. Kinney et al., *A Critical Evaluation of Acute Ozone Epidemiology Results*, 43 ARCH. ENVTL. HEALTH 168 (1988).

52. Ruckelshaus June Letter, *supra* note 3, at 3.

53. Speaking at a news conference to discuss a legislative proposal to require cost-benefit analysis when federal rules are issued, Sen. Fred Thompson (R-TN) explained that, “[f]here’s only a limited amount of money and resources that we have with regard to things such as the environment and safety and that sort of thing, which is our primary concern.” *Senators Thompson and Levin Hold News Conference to Discuss Proposed Bipartisan Legislation on Federal Regulations*, WASH. TRANSCRIPT SERVICE, Feb. 4, 1998.

54. For example, testifying in favor of legislation that would require federal rules to be based on cost-benefit analysis, Christopher C. Horner of the Small Business Survival Committee, an industry-supported organization, minimized the effort involved as follows: “S.981 merely asks the agency to do the cost-benefit analysis, and then the analysis is simply part of the rule making record.” *Hearings on S.981: The Regulatory Improvement Act Before the Senate Committee on Governmental Affairs*, 105th Cong. (1998) (statement for the record by Christopher C. Horner, Counsel to the Small Business Survival Committee).

difficult as predicting benefits, and sometimes even more so.<sup>55</sup> This makes weighing of costs and benefits difficult under the best of circumstances, but sometimes impossible when dealing with air pollution. Corporations seem incapable of projecting true costs and unwilling or incapable of being truthful. How else can nearly thirty years of consistent, massive error be explained?

Consider industry statements regarding a variety of proposed regulatory programs:

#### A. Emission Standards

When Congress was considering enactment of the first nationally uniform emission standards for automobiles in 1970, the president of General Motors protested to Senator Edmund S. Muskie (D-ME) that “[a]ccomplishment of these goals, as far as we know, simply is not technologically possible within the time frame required.”<sup>56</sup> With

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55. For example, in 1982 a variety of electric utilities projected rate increases that would result from S. 3041, which mandated an 8 million ton reduction in emission of sulphur dioxide over a 10 to 12 year period. American Electric Power projected a system-wide increase of 63.3 percent, while Southern Company Services, Indianapolis Power and Light, Ohio Edison, and Union Electric said their rate increases would be, respectively, 20 to 30 percent, 48 percent, 40 percent, and more than 25 percent. The Tennessee Valley Authority predicted a considerably lower rate increase of 7 percent. S. REP. NO. 97-666, at 71 (1982). According to the Energy Information Administration, electricity rates at three large Midwestern utilities changed from 5.07, 4.27, and 4.65 c/kwh in 1988 to 5.26, 4.27, and 4.56 c/kwh in 1996.

Table IV: Electricity Prices (cents/kwh)

Year	Illinois Power & Light	Ohio Power	Appalachian Power	U.S. Average
1988	5.07	4.27	4.66	6.35
1989	5.00	4.30	4.60	6.45
1990	5.10	4.40	4.60	6.57
1991	5.00	4.30	4.70	6.75
1992	5.00	4.20	4.70	6.82
1993	4.95	4.16	4.76	6.93
1994	5.01	4.11	4.79	6.91
1995	5.03	4.23	4.65	6.89
1996	5.26	4.27	4.56	6.86

Telephone Interview with Office of Congressional Relations, Energy Information Administration (Mar. 23, 1998).

56. 1990 LEGIS. HIST., *supra* note 5, at 358. Muskie’s response to the General Motors’ complaint leaves little doubt as to his personal commitment to the protection of human health:

The first responsibility of Congress is not the making of technological or economic judgments—or even to be limited by what is or appears to be technologically or economically feasible. Our responsibility is to establish what the public interest requires to protect the health of persons. This may mean that people and industries will be asked to do what seems to be impossible at the present time. But if health is to be protected, these challenges must be met. I am convinced they can be met.

*Id.* at 227.

modification, the standards were adopted and 11 years later the president of Chrysler conceded to Congress that “industry took out the first 58 grams of pollution for only \$25 in new car costs.”<sup>57</sup>

### B. Fuel Economy Requirements

When mandatory Corporate Average Fuel Economy<sup>58</sup> (CAFE) standards were proposed in the wake of the 1973-74 oil embargo, U.S. car makers resisted them bitterly. They argued that the CAFE standards would “outlaw full-size sedans and station wagons,” (Chrysler), “require all sub-compact vehicles,” (Ford), and “restrict availability of 5 and 6 passenger cars regardless of consumer needs,” (General Motors).<sup>59</sup> The standards were nevertheless adopted, yet full-size sedans, station wagons, and 5 to 6 passenger cars are widely available.<sup>60</sup>

### C. Replacing CFCs

Opposing the suggestion of eliminating chlorofluorocarbons (CFCs), the chemicals that destroy stratospheric ozone, industry said a ban would increase annual energy consumption by an amount roughly equal to 43 percent of the oil production of the Alaskan North Slope.<sup>61</sup> The prospects of developing acceptable substitutes were “remote.”<sup>62</sup> A ban was ultimately adopted, yet there were no apparent energy penalties, and substitutes for virtually all uses developed rapidly.<sup>63</sup>

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57. *Clean Air Act Oversight, Automobile Emission Standards: Hearings Before the Comm. On Environment and Public Works*, 97th Cong. 150 (1981) (statement of J.D. Withrow, Jr., Vice-President of Engineering, Chrysler Corp.).

58. *See generally* Corporate Average Fuel Economy, 40 C.F.R. pt. 600 (1997).

59. MARC ROSS ET AL., AMERICAN COUNSEL FOR AN ENERGY-EFFICIENT ECONOMY, *OPTIONS FOR REDUCING OIL USE BY LIGHT VEHICLES: AN ANALYSIS OF TECHNOLOGIES AND POLICY* (Dec. 1991). Indeed, there was some reduction in the ratio of maximum-power to weight, although almost none in interior volume, in the early 1980s. By the mid- and late-80s, however, the manufacturers were achieving the mandated standards with vehicles of interior volume and maximum-power equal to and higher than those of the early 1970s. The CAFE standards were thus an important example of successful “technology forcing” by regulation.

60. *See id.*

61. *See The Effect of Chlorofluorocarbons on the Ozone Layer: Hearings on S. 517 Before the Subcomm. on Toxic Substances and Environmental Oversight, Comm. on Environmental and Public Works*, 97th Cong. 47 (1981) (statement of Donald Lynch, General Electric Co.).

62. *See id.* (statement of Charles N. Masten).

63. *See* ELIZABETH COOK, *OZONE PROTECTION IN THE UNITED STATES: ELEMENTS OF SUCCESS* (World Resources Institute ed., 1996); *see also* EPA, *STRATOSPHERIC PROTECTION DIVISION, LISTS OF SUBSTITUTES FOR OZONE-DEPLETING SUBSTANCES* (visited Apr. 28, 1998) <<http://www.epa.gov/docs/ozone/title6/snap/lists/index.html>>; EPA, *STRATOSPHERIC PROTECTION DIVISION, PROGRAMME FOR ALTERNATIVE FLUOROCARBON TOXICITY TESTING* (Oct. 11, 1996) (visited Apr. 28, 1998) <<http://thor.he.net-paft/brochure.html>>.

D. *Acid Rain Control Costs*

When proposals to control acid rain were under consideration, the Congressional Research Service of the Library of Congress reviewed cost estimates and reported that “a factor of 10 separates these estimates . . . various utilities estimate the (electricity rate) increase at between 40 and 100 percent.”<sup>64</sup> An acid rain control program enacted in 1990 is now mid-way in its implementation, with no appreciable increase in electricity costs.<sup>65</sup>

V. PRACTICAL OBSTACLES TO CALCULATING COSTS

A. *Unknown and Unknowable Control Costs*

Control costs can be not merely unknown, but unknowable, especially at the outset of a control program. Indeed, this is the rule, not the exception, when environmental mandates are adopted.<sup>66</sup> The 1970 CAA was enacted when catalytic converters for cars, if they existed at all, were certainly unavailable commercially. Nor did “scrubbers,” or flue gas desulphurization devices for powerplants exist. How can costs be

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64. CONGRESSIONAL RESEARCH SERVICE, COMMITTEE ON ENERGY AND COMMERCE, ACID RAIN: A SURVEY OF DATA AND CURRENT ANALYSES, 66-7, (Comm. Print 1984).

65. For example, the Tennessee Valley Authority, which is the largest publicly owned electric utility in the United States, has not increased rates since 1987. See Tennessee Valley Authority, *Key Facts About TVA* (visited May 20, 1998) <<http://www.tva.gov/whatis/keyfacts.htm>>.

66. Technologies now employed on motor vehicles, for example, that were unavailable at the time U.S. emissions standards were adopted in 1970 included not only the catalytic converter, but air pumps, exhaust gas recirculation, electronic fuel injection, and stratified charge engines. See Asif Faiz et al., The World Bank, *Air Pollution from Motor Vehicles*, at 83-92 (1996). Technologies for power plants that were commercially unavailable in 1970 include the following: methods for burning coal more cleanly and efficiently, including combustion and integrated gasification-combined cycle; more efficient ways of burning natural gas, including combined cycle turbine systems; renewable energy technologies including wind turbines and solar photovoltaic cells; and, noncombustion technologies such as fuel cells. See OFFICE OF TECHNOLOGY ASSESSMENT, CONGRESS, *NEW ELECTRIC POWER TECHNOLOGIES: PROBLEMS AND PROSPECTS FOR THE 1990s*, at 19-37 (1985). When bans on nonaerosol uses of chlorofluorocarbons were first considered, there were no substitutes for uses in commercial and residential refrigeration, manufacture of rigid board foam insulation, and fumigation of food products. See *The Effects of Chlorofluorocarbons on the Ozone Layer: Hearing Before Senate Subcomm. on Toxic Substances and Environmental Oversight of the Senate Comm. on Environment and Public Works*, 97th Cong. 47, 205 (1981) (statements of Donald Lynch, General Electric Co. and the Alliance for Responsible CFC Policy). And when automobile fuel economy standards were adopted, technologies for increasing gas mileage that had not been developed or installed included 4-valve-per-cylinder engines, lock-up transmissions, superior aerodynamic drag, and low rolling resistance tires. See generally DEBORAH LYNN BLEVISS, *THE NEW OIL CRISIS AND FUEL ECONOMY TECHNOLOGIES* (1988); Philip Elmer-Dewitt, *Environment: How Do You Patch a Hole in the Sky that Could Be as Big as Alaska?*, TIME, Feb. 17, 1992, at 64.

calculated, when the control technologies or practices have yet to be invented, much less commercialized?

Even if it were possible to accurately predict the increased costs associated with proposed ambient standards, there are almost invariably a wide variety of control options available. Levels of oxides of nitrogen, for example, can be reduced by limiting emissions from either motor vehicles (either as a whole, or of specific subsets such as heavy duty trucks and buses) or stationary sources, such as electricity generating plants. This creates additional complexities.

In 1970, for example, a House bill would have required cost-benefit analyses of alternative emissions control devices for motor vehicles.<sup>67</sup> The Nixon Administration, ordinarily a friend of industry, opposed the suggestion because it would require “extensive, time-consuming testing of emission control devices and systems to evaluate their performance in the presence (in varying amounts) and absence of specific components of fuels. . . .”<sup>68</sup>

#### B. *Regional and Local Cost Variations*

There are also variations in costs depending on air quality, and they are more likely to be high where air is the dirtiest, not where it is the cleanest.<sup>69</sup> As the National Commission on Air Quality, a 13-member group that conducted a two-year, top-to-bottom review of the CAA concluded in 1981:

[i]f a national air quality standard were based in part on the cost of complying with it, the very high costs of meeting the standard in a few severely polluted areas would probably require that the standard be set at a less protective level than is achievable in a reasonable economic fashion in most areas of the country.<sup>70</sup>

Implicit in industry advocacy of cost-benefit analysis as the basis for establishing ambient standards is the assumption that the costs of pollution control exceed the benefits, if both are monetized.<sup>71</sup> Even when costs can be assigned to a given technology, they tend to drop sharply,

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67. See H.R. 17255, 91st Cong. (1970).

68. 1990 LEGIS. HIST., *supra* note 5, at 743-44.

69. NATIONAL COMMISSION ON AIR QUALITY, TO BREATHE CLEAN AIR 2.1-2 (1981).

70. *Id.*

71. Sen. James M. Inhofe (R-OK), *Inhofe Says EPA Misleads Public on Air Costs*, Press Release (April 29, 1997). In the press release, Sen. Inhofe charged that the costs of local control strategies associated with the proposed ambient standard for ozone outweigh the benefits anywhere from \$1.1 billion to \$6.2 billion, depending on the exceedences allowed, and the costs of regional control strategies outweigh the benefits anywhere from zero to \$2.4 billion, not including some hidden costs. “But even without adding up these hidden costs, the EPA’s documents still show that the costs outweigh the benefits for ozone,” Inhofe said. *Id.*



sometimes precipitously, when commercialization occurs.<sup>72</sup> Indeed, there are many instances where environmental controls reduce cost.<sup>73</sup>

### C. *Cost Drop and Innovation*

A recent example of this cost-drop phenomenon is the ban on use of chlorofluorocarbons, adopted at a time when substitutes had not been invented or commercialized.<sup>74</sup> The costs were vastly less than initially believed and, in some cases, were negative.<sup>75</sup> At Hughes Aircraft, for example, an inventive engineer developed a substitute for CFCs that is nontoxic, safe for stratospheric ozone, not a contributor to smog, and cheaper.<sup>76</sup> The company now realizes roughly \$3 million annually in sales from the product, which is based on lemon juice.<sup>77</sup>

### D. *Profits Instead of Costs*

Increasingly, rather than buying add-on controls, companies are meeting environmental requirements through process or product changes that enhance their efficiency and competitiveness.<sup>78</sup> Leading proponents of this approach include Minnesota Mining and Manufacturing (3M), which has operated a Pollution Prevention Pays (3P) program since the mid-1970s; AT&T, the \$65 billion communications firm that incorporates environmental protection into its product design; and, Quad-Graphics, a

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72. For example, the costs of generating electricity with solar thermal systems, wind turbines and fuel cells have all dropped dramatically in the past decade as governmental policies—principally outside the United States, but to some degree in California—have brought these technologies to market. Wind turbines can currently reliably generate electricity for the same price or less as a new coal-fired power plant, but cost many times more in the 1980s. See CURTIS MOORE & ALAN MILLER, *GREEN GOLD: JAPAN, GERMANY, THE UNITED STATES AND THE RACE FOR ENVIRONMENTAL TECHNOLOGY* 105-24 (1994).

73. For example, Quad Graphics, a \$500 million printing company with about 5,300 employees reduced costs by \$500,000 through changes that eliminated waste ink. U.S. chemical company 3M estimates that its “3P,” or Pollution Prevention Pays, has saved the firm about \$573 million since its inception in 1975 while reducing pollution by half. Export Packers Company increased net annual revenue by \$150,000 by converting its waste egg shells into a food supplement rather than disposing of them. Power plants in Germany manufacture construction products from the residuals of their air pollution control systems. See JOEL MAKOWER, *THE E-FACTOR: THE BOTTOM-LINE APPROACH TO ENVIRONMENTALLY RESPONSIBLE BUSINESS* 60-64 (1993).

74. See COOK, *supra* note 63.

75. See John S. Hoffman, *Replacing CFCs: The Search for Alternatives*, 19 *AMBIO* 329, 333 (1990); see also Curtis A. Moore, *Industry Responses to the Montreal Protocol*, 19 *AMBIO* 320, 323 (1990).

76. See MOORE & MILLER, *supra* note 72, at 108-09.

77. See *id.*

78. See, e.g., T.E. GRAEDEL & B.R. ALLENBY, *INDUSTRIAL ECOLOGY* (1995); JOSEPH J. ROMM, *LEAN AND CLEAN: HOW TO BOOST PROFITS AND PRODUCTIVITY BY REDUCING POLLUTION* (1994); ERNEST CALLENBACH ET AL., *ECOMANAGEMENT: THE ELMWOOD GUIDE TO ECOLOGICAL AUDITING AND SUSTAINABLE BUSINESS* (1993).

\$1 billion printing company that reduces air pollution by reformulating its inks and improving its printing process, thus lowering costs and developing marketable products.<sup>79</sup>

Nevertheless, requirements such as the ozone and PM<sub>2.5</sub> standards may entail some costs. Whether the costs exceed the benefits is another matter, and depends in part on subjective questions such as the value of life. That introduces yet another complexity.

### *E. Monetizing Life*

In order for benefits to be balanced against control costs, a dollar value must be assigned not only to life itself, but a wide range of illnesses. The intelligence of small children, for example, must be assigned a dollar value, as well as the pain suffered by children racked by asthma. The life of a 65-year-old severe asthmatic would have to be given a dollar value, and so would that of the 45-year-old executive with a bronchial infection that makes him vulnerable to PM<sub>2.5</sub>. Momentary drops in the oxygen supply to fetuses must be assigned a value as well. Would that be only a few pennies or many dollars?

Assuming that the full range of health effects—everything from increased hospital admissions caused by ozone to the deaths resulting from particulate matter—could be identified and assigned a value, the task of calculating the number of these events would remain. Is the number of Americans killed by particulate matter 50,000 each year or 100,000? Whose burden is it to establish this? Is the intelligence destroyed by lead one IQ point or five, and how many children is that in the aggregate? Is the value of the intelligence loss greater when the child is at genius or near genius level—that is, what is the value of a loss to America of a Thomas Edison, Margaret Mead, Martin Luther King, Thomas Jefferson or, for that matter, Bill Clinton or Newt Gingrich?

Assuming that all these difficulties can be overcome, one question remains: should they? As former Senator Robert T. Stafford (R-VT), one of the drafters of many of America's environmental laws, said, "America did not abolish slavery after a cost benefit analysis, nor prohibit child labor after a risk assessment. We did those things because money is only one way of expressing value—and sometimes it is the least important."<sup>80</sup>

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79. See MAKOWER, *supra* note 73, at 60-64.

80. See Gregory S. Wetstone, *And Now, Regulatory Reform (See Above)*, N.Y. TIMES, Feb. 23, 1998, at A23.

## VI. AMERICA AS A VALUES-BASED DEMOCRACY

One of the ironies of cost-benefit analysis is that it is being urged in the last place where it would logically be expected to arise. In a totalitarian nation, whether controlled by a single dictator or an oligarchy, it would be no great surprise to suggest that the government appropriate liberties for the sake of allegedly reducing aggregate social costs. Or in a developing nation with millions standing at the brink of starvation, it might be expected that some would say survival of the mass is the overriding societal priority. Or, in a democracy that historically has placed a higher value on the supposed collective good, the subordination of individual rights and liberties to collective rule could be expected. But in the United States?

From its very inception, human values have formed the core of what we today call the United States. At the nation's birth, the Revolution, the Colonies agreed that "men are endowed with certain unalienable rights, that among these are life, liberty and the pursuit of happiness."<sup>81</sup> The Constitution, approved 11 years later with the appended Bill of Rights, elaborated on and explicitly guaranteed some of these rights,<sup>82</sup> which have not only come to symbolize America, but have proven to be one of its greatest strengths.

Freedoms of speech, press, and religion are quintessentially American,<sup>83</sup> and protection of contract rights has fostered private enterprise to a degree unrivaled by any other nation. Americans enjoy the rights to vote, speak their minds, and bear arms.<sup>84</sup> Those who drafted the Constitution did not ask whether it was cost-effective to allow defendants to be tried by a jury of their peers or to maintain a representative democracy.<sup>85</sup> Of the many questions answered by the Federalist Papers, none related to the question of whether the benefits of liberty justified its costs.

Yet the very essence of cost-benefit analysis is not only a premise that rights can be alienated, but that they can be—*must* be—seized by the government if their monetary value is too slight. Whatever term is used to characterize such a policy—immoral, unjust, or unethical, to use but three—it is clearly wrong: first because it is antithetical to the core values of America; second, because it would lead inevitably to anarchy.

Indeed, the concept that rights and values first should be monetized and then extinguished or diminished if the financial burden placed on

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81. THE DECLARATION OF INDEPENDENCE para. 3 (U.S. 1776).

82. U.S. CONST. amend. I-X.

83. *See id.* at amend. I.

84. *See* U.S. CONST. amend. XIX, I, II.

85. *See* U.S. CONST. amend. VI, VII.

those who must observe the right exceeds its dollar value is revolutionary. If health and life are to be monetized and placed on the scales, then why not other liberties: freedoms of speech and assembly, trial by jury, or the bearing of arms?

Some might say that these enumerated liberties differ from health and life precisely because they are enumerated. Yet security in one's person is the most basic of all rights, and without it, the others matter little. Indeed, so basic is this right of security that our common law, and statutes reflecting it, have protected it for centuries.<sup>86</sup>

Part of America's tradition of protecting liberties—including freedom from the harmful effects of pollution—was inherited from the English.<sup>87</sup> Seven centuries ago, the King of England banned the burning of so-called "seacoal" in order to reduce soot or smoke that we today term particulate matter pollution.<sup>88</sup> Violators were hanged.<sup>89</sup>

As the common law evolved in the United States, it provided remedies for damages caused by air pollution, typically for interference with the possessor's interest in the use and enjoyment of land.<sup>90</sup> Often these were based on private nuisance theory for interference with the use and enjoyment of property.<sup>91</sup> In some cases, the rights interfered with are relatively minor, in which case, the courts apply a balancing test.<sup>92</sup> Other rights, however, are inviolable and their infringement is nuisance *per se*,<sup>93</sup> or absolute nuisance.<sup>94</sup> "The traditional test for determining what is a nuisance *per se* is that the nuisance has become dangerous at all times and under all circumstances, to life, health or property. . . ."<sup>95</sup> The question of dangerousness is for the jury, but "if the act in its inherent nature is so hazardous as to make the danger extreme and to make serious injury so probable as to be almost a certainty, it should be held a nuisance as a matter of law."<sup>96</sup>

The common law also provides relief in cases of public nuisance, which is so called because it is based on interference with a public right.<sup>97</sup> The interests of the public are protected in actions initiated by

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86. See generally WILLIAM A. PROSSER, HANDBOOK OF TORTS 592-623 (1964).

87. See *id.*

88. See generally PETER BRIMBLECOMBE, THE BIG SMOKE: THE HISTORY OF AIR POLLUTION IN LONDON SINCE MEDIEVAL TIMES (1987).

89. See *id.*

90. See, e.g., *Patterson v. Peabody Coal Co.*, 122 N.E.2d 48 (Ill. App. Ct. 1954).

91. See generally 58 AM. JUR. 2D *Nuisances* § 100 (1989).

92. See *id.* at § 105.

93. See *id.* § 24.

94. See *id.* at § 18.

95. *Id.* § 19.

96. *Id.*

97. See *id.* § 33.

prosecutors, but private parties have a cause of action if there is an injury that differs in kind from that suffered by the general public.<sup>98</sup> As a general proposition, proof of personal injury flowing from a public nuisance always gives the plaintiff the special interest required to maintain a suit for public nuisance.<sup>99</sup>

Thus, injury of the sort caused by air pollution regulated by the CAA would clearly be actionable at common law because, by definition, a criteria air pollutant is one that causes personal injury.<sup>100</sup> Depending on the circumstances, courts are willing to require either abatement of pollution—essentially the approach taken by the CAA in that it requires State Implementation Plans (SIPs) to reduce ambient concentrations below the levels of the primary standards<sup>101</sup>—or award money damages.<sup>102</sup>

Faced with a conflict between the property rights of one party and the personal rights of another, both the courts and Congress have shaped remedies that preferentially protect personal liberties.<sup>103</sup> In both instances, however, care has been taken to allow property interests to be taken into account in developing the remedy (e.g. the SIP in the case of the CAA or the injunctive relief or even abatement in the case of private litigation).<sup>104</sup>

Now corporations, economists, and others are challenging the value judgments implicit in both the common law and the CAA. They assert, in the words of William Ruckelshaus, that basing a system of regulation on protection of human health or the environment is “inherently irrational.”<sup>105</sup> Are they correct? The law cannot provide an answer to this question, because it tells us only what we are obliged to do, not why. To explore the reasons for protecting health in conflicts between it and property requires an examination of morality and ethics, not law.

It is important to bear in mind that the law evolves in part to establish a code of conduct that is for the general benefit of society and, thus, for the good of each and all of us, because without the security

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98. See PROSSER, *supra* note 86, at 101.

99. See 58 AM. JUR. 2D *Nuisances* § 8 (1989). See also PROSSER, *supra* note 86, at 609 (“Where the plaintiff suffers personal injury . . . there is no difficulty in finding a different kind of damage.”).

100. See CAA § 108(a)(1), 42 U.S.C. § 7408(a)(1)(1994). A “criteria” pollutant is one, the emissions of which “(A) . . . cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare; [and] (B) the presence of which in the ambient air results from numerous or diverse mobile or stationary sources.” *Id.* § 108(a)(1)(A), (B), § 7408(a)(1)(A), (B).

101. See CAA § 110(a)(1), 42 U.S.C. § 7410(a)(1).

102. See *id.* § 110(m), § 7410(m).

103. See PROSSER, *supra* note 86, at 623-27.

104. See *id.* at 625-27.

105. Ruckelshaus June Letter, *supra* note 3, at 1.

provided by society we could not survive as individuals. Today, the importance of this social fabric is obscured by the cult worship of the individual, often expressed in terms of entrusting the solution of our societal ills to a “free market” and “enterprise.”<sup>106</sup> The “market,” in the persons of the multinational corporations that dominate the global economy, will cure all, we are told with ever greater frequency, especially by those most entranced by the free enterprise system, libertarians (by which I am not referring to members of the Libertarian Party, but rather those individuals who embrace a philosophy founded on the protection of wealth and property, which includes a very large proportion of Republicans, some Democrats, and virtually all corporations) and economists.

Critics of protective legislation such as the CAA, quote with considerable approval the philosophy of nineteenth-century writer John Stuart Mill. This is due in part to Mill’s eloquent exploration in his essay, *On Liberty*,<sup>107</sup> of the nature and limits of the power that can be legitimately exercised by society over the individual, by which Mill meant a mature and competent human.<sup>108</sup> Mill concluded that

the sole end for which mankind are warranted, individually or collectively in interfering with the liberty of action of any of their number, is self-protection. That the only purpose for which power can be rightfully exercised over any member of a civilized community, against his will, is to prevent harm to others. His own good, either physical or moral, is not a sufficient warrant. . . . Over himself, over his own body and mind, the individual is sovereign.<sup>109</sup>

Sweeter words have seldom been heard by those who believe the afflictions of ordinary humans are mere trifles to the costs of avoiding them. Yet Mill had more to say on this subject, although those views are less often recited by those who favor cost-benefit analysis.

## VII. THE PRESERVATION OF ORDER BY THE PROTECTION OF RIGHTS

Right and wrong are words not often heard in the political debates of today. Yet if all of the practical obstacles to adopting cost-benefit analysis are overcome, what remains is the fundamental issue of whether it is

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106. *Downsizing Government and Setting Priorities of Federal Programs, Part 1: Hearing Before the Subcomm. on Interior Appropriations of the House Appropriations Comm.*, 104th Cong. 609 (1995) (statement of Jerry Taylor, Director of Natural Resource Studies, Cato Institute).

107. JOHN STUART MILL, *ON LIBERTY AND OTHER ESSAYS* (John Gray ed., Oxford Univ. Press 1991) (1859).

108. *Id.*

109. *Id.*

moral for society to take the life of a citizen merely because of the cost. Why, in a period of self aggrandizement and glorification of the individual, should society be concerned with abstractions such as justice, morality, and ethics? The answer to that is self-interest and survival.

This is not merely a question of ethics, but runs to a fundamental question as to the proper role of government and the social consequences of decisions that implicitly sacrifice the health or well being of one party for the economic benefit of another. As John Stuart Mill himself counseled:

The moral rules which forbid mankind to hurt one another (in which we must never forget to include wrongful interference with each other's freedom) are more vital to human well-being than any maxims . . . [because] [i]t is their observance which alone preserves peace among human beings: if obedience to them were not the rule, and disobedience the exception, every one would see in every one else an enemy, against whom he must be perpetually guarding himself. . . .<sup>110</sup>

Indeed, even Adam Smith, the intellectual father of the free enterprise, concluded that government administration of a body of "positive law" was essential.<sup>111</sup> "Without this precaution," explained Smith, "civil society would become a scene of bloodshed and disorder, every man revenging himself at his own hand whenever he fancied he was injured."<sup>112</sup>

What Adam Smith and John Stuart Mill understood, and what those who today would sacrifice the health of Americans for the sake of corporate profits do not, is that in order for America to function—not just as a democracy, but even as a nation—the people must be willing for that to happen. Protection of the values that ordinary citizens cherish is the

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110. *Id.* at 196. Mill continues:

a person may possibly not need the benefits of others; but he always needs that they should not do him hurt. Thus the moralities which protect every individual from being harmed by others, either directly or by being hindered in his freedom of pursuing his own good, are at once those which he himself has most at heart, and those which he has the strongest interest in publishing and enforcing by word and deed. It is by a person's observance of these that his fitness to exist as one of the fellowship of human beings is tested and decided; for on that depends his being a nuisance or not to those with whom he is in contact. Now it is these moralities primarily which compose the obligations of justice.

*Id.* at 196.

111. See Andrew Skinner, *Introduction* (quoting ADAM SMITH, *THE THEORY OF MORAL SENTIMENTS* (1759)), in ADAM SMITH, *THE WEALTH OF NATIONS* 26 (1979) (1776). Initially famed for his work on social philosophy, expressed in *The Theory of Moral Sentiments* (1759) rather than for theoretical economics as outlined in *The Wealth of Nations* (1776), Smith also supported, for example, government-imposed monopoly under certain circumstances such as the protection of intellectual property through patents. See *id.*

112. See *id.*

glue that binds us all together and makes the nation function. It is the engine that drives the machine called America, which in turn makes it possible for a small number of individuals to enjoy wealth beyond the wildest imaginings of billions of humans. That is why, in Mill's words:

[E]very one who receives the protection of society owes a return for the benefit, and the fact of living in society renders it indispensable that each should be bound to observe a certain line of conduct towards the rest. This conduct consists, first, in not injuring the interests of one another; or rather certain interests, which, either by express legal provision or by tacit understanding, ought to be considered as rights; and secondly, in each person's bearing his share (to be fixed on some equitable principle) of the labors and sacrifices incurred for defending the society or its members from injury and molestation. These conditions society is justified in enforcing, at all costs to those who endeavor to withhold fulfillment.<sup>113</sup>

The current system of values was arrived at neither lightly nor quickly. It is not as if Americans awakened one fine day to find, mature and fully grown, the present system. It has painstakingly evolved, a jot and a tittle at a time, over centuries.

Sadly, amongst some of the advocates of cost-benefit balancing there is a vein of hypocrisy. Consider, for example, those members of Congress who have introduced legislation to assure "the right to life of each born and preborn human person from the moment of fertilization,"<sup>114</sup> similar in import to other legislation to protect life "from the moment of conception."<sup>115</sup> Included among these legislators are those who have also proposed to prohibit any major rule by an agency of the federal government unless "the potential benefits . . . outweigh the potential costs."<sup>116</sup> In one setting—abortion—they are willing to protect life at any cost, while in another—regulation generally—they protect life only if its value monetarily is greater than the costs. How can such seeming inconsistency be explained? The answer is provided by corporations.

#### VIII. THE ROLE OF CORPORATIONS

It is commonly accepted that corporations exist for the sole purpose of making a profit, and to many of them, government regulations provide

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113. MILL, *supra* note 107, at 75.

114. H.R. 641, 105th Cong. (1997).

115. S.J. Res. 130, 93rd Cong. (1973). In introducing his anti-abortion proposal, Senator Jesse Helms (R-NC) observed that "if an innocent human being can be defined as a nonperson [and therefore not entitled to Constitutional rights] because he is too young . . . there is no reason in principle why he cannot be defined as a nonperson because he is too old, or too retarded, or too disabled." GERALD GUNTHER, *CASES AND MATERIALS ON CONSTITUTIONAL LAW* 656 (1975).

116. H.R. 821, 105th Cong. (1997).



yet another opportunity to do so. In the words of one former Ford Motor Company executive:

Business views the political system as a source of business advantage. Almost anything can be a business advantage—a subsidy, a tax break, an entry barrier, a spurt in the rate of economic growth, a government purchase, a regulatory move that hurts a competitor, etc. Thus business’s agenda has an open-ended, mercurial, opportunistic character.

Some [business advantages] are overt . . . [but] [m]ost business advantages, however, are covert. They flow from policies whose overt purpose is to accomplish an unrelated public objective, such as reducing air pollution. But policies have unacknowledged or unintended practical effects that help some businesses and hurt others. Most business lobbying is intended to capture the covert benefits of public policies and deflect any covert costs onto others.<sup>117</sup>

Thus, to the corporation, money is more important than the quality of the environment or the integrity of the American political system. Money is the language that corporations speak and it is the yardstick by which they measure value. From a corporate perspective, if not that of a human, monetizing values and making decisions through cost-benefit balancing is not only sensible, but irresistible. This suggestion admittedly has the ring of paranoia and suspicion to it, but how else can one explain the massive involvement by corporations in governmental decision-making through the financing of campaigns? And who can deny that our legal system compels corporations to adopt such an attitude?

Consider the lesson that Henry Ford learned regarding the proper objectives of a corporation. In his earlier years, many of Ford’s actions exemplified humanitarian, progressive ideals.<sup>118</sup> He introduced the 8-hour day and the \$5 daily wage, instituted a profit-sharing plan for his workers, and supported efforts by pacifists to halt World War I through mediation.<sup>119</sup> Ford’s base of power and wealth was the Ford Motor Company, which he founded in 1903.<sup>120</sup> It began production in 1909 of what is probably history’s most famous car, the “Model T,” popularly known as the “flivver.” A standardized vehicle produced on an assembly line, the Model T’s low price brought automobile ownership within the reach of millions of middle class Americans.<sup>121</sup>

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117. PAUL H. WEAVER, *THE SUICIDAL CORPORATION: HOW BIG BUSINESS FAILS AMERICA* 166-67 (1988).

118. *See generally* ALLAN NEVINS, *FORD: THE TIMES, THE MAN AND THE COMPANY* (1954); CAROL W. GELDERMAN, *HENRY FORD: THE WAYWARD CAPITALIST* (1981).

119. *See* NEVINS, *supra* note 118, at 533; *see also* ANNE JARDIM, *THE FIRST HENRY FORD: A STUDY IN PERSONALITY AND BUSINESS LEADERSHIP* 123-24 (1974).

120. *See* NEVINS, *supra* note 118, at 237.

121. *See id.*

By 1916, Ford sales had been so extraordinary that the company was declaring not only five percent monthly dividends, but year-end and special dividends as well.<sup>122</sup> At a price of \$440, the car was selling so well that Ford, then owner of 58 percent of the corporate stock, decided to expand production.<sup>123</sup> “My ambition is to employ still more men,” Ford later told a court “to spread the benefits of this industrial system to the greatest possible number, to help them build up their lives and their homes.”<sup>124</sup>

But Ford wanted to spread the benefits of his exceptional success even further and share the wealth with those to whom he was most grateful: his customers.<sup>125</sup> “Ford was of the opinion that his company had made too much money,” wrote legal scholar Norman Lattin, “and that, although large profits might still be made, they should be shared with the public by reducing the price of the car.”<sup>126</sup> The automotive genius decided to drop the price of a car from \$440 to \$360, and was promptly sued by the company’s minority shareholders and just as promptly rebuked by the court.<sup>127</sup> The court barred the price cut, admonishing Ford that:

There should be no confusion (of which there is evidence) of the duties which Mr. Ford conceives that he and the stockholders owe to the general public and the duties which in law he and his codirectors owe to protesting, minority stockholders. A business corporation is organized and carried on primarily for the profit of the stockholders. The powers of the directors are to be employed for that end. The discretion of the directors is to be exercised in the choice of means to attain that end, and does not extend to a change in the end itself, to the reduction of profits, or to the nondistribution of profits among stockholders in order to devote them to other purposes.<sup>128</sup>

Corporations have evolved considerably since the court’s rebuff of Henry Ford’s attempt to give the public a “break.” Many states have now enacted laws explicitly allowing corporations to act for the benefit of the public, even if that might mean some reduction in profits.<sup>129</sup> But not all states have such laws and even in those that do, the amount that a

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122. See NORMAN LATTIN, *LATTIN ON CORPORATIONS* 211-12 (2d. ed. 1971).

123. See *id.* at 185.

124. See *id.* (quoting *Dodge v. Ford Motor Co.*, 170 N.W. 668, 671 (Mich. 1919)).

125. See *id.*

126. *Id.* “[L]et me say right here that I do not believe that we should make such an awful profit on our cars. A reasonable profit is right, but not too much. So it has been my policy to force down the price of the car as fast as production would permit, and give the benefits to users and laborers.” Ford said in 1916. JARDIN, *supra* note 119, at 93.

127. See *id.* (citing *Dodge v. Ford Motor Co.*, 170 N.W. 668 (Mich. 1919)).

128. *Dodge v. Ford Motor Co.*, 170 N.W. at 671.

129. See LATTIN, *supra* note 122, at 211-12.

corporation can donate to charity is limited.<sup>130</sup> In some cases, the limit may be an explicit amount (e.g. five percent of net income) but it can never be a sum so large as to be “unreasonable.” Whether or not corporations owe some duty to “acknowledge and discharge social as well as private responsibilities,” this obligation is always subject to “reasonable limits.”<sup>131</sup> Profit remains the yardstick against which the corporation and its officers are measured.

In pursuing profits, corporations act rationally from their perspective, but their interests differ, sometimes sharply, from those of their human customers and neighbors. Indeed, the agenda and priorities of corporations that have chosen to become involved in the messy business of developing social policy are usually directly at odds with those of the human public, whether the subject is global warming, liability for releases of toxic chemicals or the appropriate basis for setting air quality standards. The only language of corporations, and the metric common to all of them, is money. It is the only corporate means of expressing value. To humans, however, money is merely one way of measuring value, and sometimes it is the least important. Who among us, for example, has not used money as a tool to purchase other things of value for which corporations have neither need nor understanding: comfort, time, food, sleep, companionship, or health, to name but a few.

A better environment, one that is protective of our health and the health of our children, is one of the things that humans purchase with money. Is it worth it? Clearly, those who wrote the CAA of 1970 thought so. Just as clearly, many corporations, some of the very wealthy, and their supporters—among whom must be numbered the vast majority of Congressional Republicans—do not. Yet because of the wide and deep public support for protection of health and the environment, those seeking to repeal provisions such as health-based standards dare not say so openly for fear that the wrath of voters will be visited upon them.

It is for this reason that attacking the health-basis of the ambient standards presents, as William Ruckelshaus described to George Bush and his aides in 1981, both “opportunity and hazard.”<sup>132</sup> He continued,

[r]ightly or wrongly, the Clean Air Act amendments have been billed as symbolizing the struggle over social regulation. . . . According to every poll I have seen, including a very comprehensive one by Opinion Research Corporation, which I left with Bill Niskanen, the Administration’s position

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130. *See id.*

131. *See LATTIN, supra note 122, at 186-87 (citing A.P. Smith Mfg. Co. v. Barlow, 98 A.2d 581 at 586 (N.J. 1953)).*

132. Ruckelshaus June Letter, *supra note 3, at 1.*

on social regulation is considerably further away from public opinion than the rest of your economic program.<sup>133</sup>

The intervening years have, if anything, solidified public support for protection of health and the environment. So, instead of openly admitting that their so-called “reforms” are truly intended to repeal provisions such as the health basis of ambient standards, politicians adopt euphemisms for their proposals, such as “middle class regulatory relief.”<sup>134</sup> Sadly, propagated by vast sums of money, such deceits eventually prove effective in many cases. So, as the tide seems to continue moving away from laws based solely on protecting human health and toward those predicated on cost to industry, there is a distinct possibility that the CAA will be amended to repeal the present mandate for protecting health.<sup>135</sup>

To substitute for the current health-based standards a system that places a higher value on property than on health, will require Congress to not only repeal the relevant provisions of the CAA, but to preempt state laws as well. The states’ common law allowing either equitable relief or damages for injury to health would have to be preempted, as would statutory laws based on the Federal CAA (e.g. the California Clean Air Act).

Ultimately, the last recourse will be to the public and courts where, hopefully, voters and jurists alike will bear in mind the counsel of Daniel Boorstein:

As the quantitative dimensions of our social problems inflate, we hear plaintive pleas for the “quality” of life. What do we mean by “quality of life” in the United States today? We can do worse than define it as anything and everything that cannot be grasped quantitatively. This would include, of course, faith, love, literacy, art, human fulfillment, history and life itself. But must we define what is most important to us only in residual terms? Perhaps it is the statistical aspects of life that are the residue. They are self-fulfilling prophecies from which we alone can rescue ourselves.<sup>136</sup>

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133. *Id.* at 2-3.

134. H.R. 821, 104th Cong. (1995).

135. Certainly, industry intends to continue its fight to repeal the standards, according to the president of the U.S. Chamber of Commerce, Thomas Donahue. Speaking at a press conference on April 20, 1998, Donahue assailed Congressional Republicans for a “total lack of courage” in their failure to overturn the newly proposed ambient standards. He then warned members of Congress that “We will throw your ass out of here with a loud clunk if (you) do not deal with this issue.” Pamela Newman-Barnett, *Donohue Slams White House, Hill on Environmental Regs*, CONG. DAILY, Apr. 20, 1998, at 2.

136. DANIEL BOORSTEIN, *CLEOPATRA’S NOSE: ESSAYS ON THE UNEXPECTED* 157 (1994).

## IX. CONCLUSION

While the requirement that ambient standards be based solely on protection of human health is perhaps the most controversial provision of the CAA, it is also among the most effective. Although levels of many air pollutants remain at dangerous concentrations, emissions have nevertheless been held in check relatively successfully in the face of steady economic growth and unrelenting pressure to relax implementation requirements. In all probability, the 1970 CAA has saved millions of lives.

Based on such a record of success, one would expect public health advocates, analysts, and legislators to be examining the possibility of replicating the law, and extending the concept of health-based protection to other areas, such as drinking water protection and pesticide use. Instead, attention has focused almost exclusively on effectively repealing the provision that has proved to be one of the law's greatest strengths: namely, the requirement that standards be based solely on protection of health, a standard that is inherent in common law and possibly the Constitution as well.

Repealing the health-based standards is advocated almost exclusively by corporations, economists, and their allies, some of whom may be blind to the impracticality and immorality of their suggestions that the law ought to protect money instead of people. In deciding whether to embrace the view advanced by these corporations, Congress, the President, and the judiciary would do well to heed the counsel of Adam Smith, who said the proposals of powerful mercantile interests—

ought always to be listened to with great precaution, and ought never to be adopted till after having been long and carefully examined, not only with the most scrupulous, but with the most suspicious attention. It comes from an order of men, whose interest is never exactly the same as with that of the public who have generally an interest to deceive and even to oppress the public, and who accordingly have, upon many occasions, both deceived and oppressed it.<sup>137</sup>

In fairness, the purpose of this Article is not to assail the motives of the advocates of cost-benefit analysis, many of whom are well intended, but to make a series of points that have been largely absent from this debate. Establishing standards on the basis of protecting public health has worked well in controlling air pollution. The alternative advanced most often by its critics—cost-benefit analysis—is largely untried and

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137. See Skinner, *supra* note 111, at 90 (quoting ADAM SMITH, THE THEORY OF MORAL SENTIMENTS (1759)), in ADAM SMITH, THE WEALTH OF NATIONS (1979) (1776)).

manifestly unworkable. In the context of a democracy predicated on protection of human life and liberty, it is also immoral.

Despite these failings, cost-benefit analysis is being persistently advanced by corporations, many economists, and their allies. The motives and tenacity of corporations, whose interests are often antithetical to those of humans, can be explained by examining the tenets of corporate law. To the corporate form of doing business, such an approach is neither oppression (in the words of Adam Smith) nor a tyrannical principle (in the words of Abraham Lincoln). It is merely protecting the interests of shareholders, as the law requires.

What corporate entities fail to appreciate (and, indeed, by their very nature may be incapable of understanding)—but which Adam Smith and John Stuart Mill did—is that defining the public interest solely in terms of money is dangerous to capitalism itself. It leaves an aggrieved public with no recourse but to turn on the government, the institution that makes capitalism possible. Having more than once asserted what Lincoln called “the common right of humanity” in the “struggle between . . . right and wrong,” it seems unlikely that the American public would fail to do so again, to the ultimate injury of us all.

As in so many other conflicts, the judiciary is uniquely situated to resolve this conundrum, because if corporations succeed in persuading Congress to repeal health-based standards, it will fall to the courts to decide whether the common and statutory laws can constitutionally be overridden. Recognizing that courts are likely to be confronted with this considerable constitutional conflict—if not in the CAA, then by some other statute—jurists, scholars, and students should begin examining the legal and other implications of laws that expressly sacrifice health and life to protect money.