mand") was calculated for each bill. From these figures, the total costs of the program were estimated, and the tax burden imposed by the bill was then determined. To obtain the tax burden at each income, the appropriate tax rates were applied to the total tax burden (appendices B and C).

7. For every bill, the employer's portion of a premium and of a payroll tax is shown as a burden on the employee because in the long run the employer will, in nearly all instances, be able to shift these costs to his workers (appendix E).
8. In terms of welfare economics our measure of income redistribution overstates benefits to the extent that a family, if given the choice, would purchase less coverage than that mandated.
9. Because of the technique used in our calculations, the difference in the amount of redistribution produced by the Corman-Kennedy bill is understated by a small amount. This understatement occurs because the Corman-Kennedy bill shifts the portion of the current Medicaid program now funded by the states to federal taxpayers, whereas under the Administration and Kennedy-Mills bills, the revenues for funding the Medicaid program would continue to be raised by somewhat less progressive state taxes.
10. Under the Long-Ribicoff bill, some 40 percent of out-of-pocket expenses would be in the form of premium payments for voluntary insurance.
11. The Long-Ribicoff bill also provides that if a family earning more than $4800 spends all of its income in excess of that amount on medical care, it is then entitled to full coverage for the remainder of that year. This provision will be of benefit to only a small number of families (appendix D).
12. J. P. Newhouse, *Inflation and Health Insurance* (Rand Corporation, Santa Monica, Calif., 1975); M. S. Feldstein and B. Friedman, in *The Role of Health Insurance in the Health Services Sector*, R. N. Rosett, Ed. (National Bureau of Economic Research, New York, 1976).
13. The Administration bill reduces the burden on low-income families to a lesser degree than the other bills because it does not relieve the employer of his share of a premium payment (75 percent of the total, or $450) and, because the employer will very likely pass this cost on to his employee, the employer's payment represents a continued burden on the worker (appendix E).
14. The Administration bill does, however, provide a partial premium subsidy for those earning less than $5000 per year and thus redistributes income to a small extent.
15. The practical implementation of a subsidized premium program might take one of several forms. One approach would be to mandate the provision of a standard group insurance policy by employers but at the same time to subsidize low-income employees and their employers by providing each with credits against their income tax payments. For those low-income workers whose tax credit was larger than the income tax that they owed, a refund would be paid by the government.
16. Government agencies now have lower claims-processing costs per dollar of benefits paid than do private insurers, but because of differences in program characteristics, such as the size of the average government claims, it is not clear that public agencies are inherently more efficient [R. D. Blair and R. J. Vogel, *The Costs of Health Insurance Administration* (Heath, Lexington, Mass., 1975)]. In fact, a recent study comparing the processing of an identical profile of Medicare claims by private firms and by the Social Security Administration indicates that costs per claim are lower under private administration [U.S. General Accounting Office, *Performance of the Social Security Administration Compared with That of Private Fiscal Intermediaries in Dealing with Institutional Providers of Medicare Services* (Report to the House Committee on Ways and Means, 30 September 1975)]. It is also frequently argued that a considerable savings would result under public administration of an NHI program because the government does not need to earn a profit whereas a private insurer must. However, the apparent savings that a public program enjoys by forgoing a profit are deceptive; in raising capital, public agencies incur expenses that are analogous to payments by private insurers to their investors (profits). However, in the case of the government, these expenses are obscured because, for example, the interest on borrowed funds (such as government bonds) does not appear in the agency's budget. Conversely, the administrative costs of the Medicare and Medicaid programs are inflated relative to those of private insurers because they include expenses for regulatory functions that are not performed by private companies. However, the value of such regulation has been seriously questioned [C. C. Havighurst, Ed., *Regulating Health Facilities Construction* (American Enterprise Institute for Public Policy Research, Washington, D.C., 1974); R. G. Noll, in *Controls on Health Care* (National Academy of Sciences, Washington, D.C., 1975); P. O'Donoghue, *Evidence About the Effects of Health Care Regulation* (Spectrum Research, Denver, Colo., 1974); R. A. Posner, *Univ. Chicago Law Rev.* **39**, 1 (1971)].
17. B. M. Mitchell and C. E. Phelps, *Employer-Paid Group Health Insurance and the Costs of Mandated National Coverage* (Rand Corporation, Santa Monica, Calif., 1975). A related objection to a program based on premiums—namely, that it discourages the hiring of workers prone to illness—can be overcome by pooling the insurance risks of employees of smaller firms into larger statistical groups (appendix E).
18. U.S. Department of Health, Education, and Welfare, *National Health Insurance Proposals* (Social Security Administration No. 75-11920, Washington, D.C., 1974).
19. J. A. Pechman and B. A. Okner, *Who Bears the Tax Burden?* (Brookings Institution, Washington, D.C., 1974).
20. Supported by a grant from the Department of Health, Education, and Welfare to the Rand Corporation. Research was carried out in 1974–75 while W.B.S. was a Macy Faculty Scholar. The views presented in this article are those of the authors and do not necessarily reflect those of the Rand Corporation or the sponsors of its research. We thank J. P. Newhouse for his continued support and critical advice over the course of this research; A. J. Alexander, G. V. Bass, B. C. Hallowell, L. E. Lynn, C. E. Phelps, and M. A. Rockwell for helpful comments and reviews of drafts; and B. M. Mori and S. Yamasaki for research assistance. A longer version of this article is scheduled for publication as Rand Corporation Report R-1711.

Social Impact of Pollution Control Legislation

The Clean Air Act and court decisions interpreting it will affect far more than air quality.

Wallace H. Johnson

The basic unity of things, their interdependence, and the fact that an alteration in a condition at one point in an infinite chain of interrelationships will result in an almost infinite number of changes at other points, is what I take to be at the heart of the environmental movement. It is, indeed, the principle at the heart of one of the most important statutes to emerge from the environmental movement, the National Environmental Policy Act of 1 January 1970 (*1*), wherein Congress, within the area over which it has jurisdiction—actions by the federal government—has decreed that every such proposed major action be preceded by the preparation of a detailed statement of its impact upon the human environment.

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Clean Air

To illustrate how profound the economic, social, political, cultural, and demographic impacts can be of an action which seems at first blush to be physical and local, consider the Clean Air Act (*2*), which was enacted in its present form on 31 December 1970. The statute is intended to eliminate air pollution and the ensuing hazard to health resulting from breathing noxious fumes. The statute's mechanism for achieving this result affects all of us directly in our professional as well as personal lives.

The act requires the establishment by the administrator of the Environmental Protection Agency (EPA) of national ambient air quality standards for specific types of air pollutants. Primary standards must be established which in the judgment of the administrator of the EPA are "requisite to protect the public health"; secondary standards are to be established which in the judgment of the administrator are "requisite to protect

the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutants in the ambient air." So far, primary and secondary standards have been established for six pollutants: sulfur dioxide, particulate matter, carbon monoxide, hydrocarbons, photochemical oxidants, and nitrogen dioxide. The act contemplates that these standards will be achieved through implementation plans, prepared by the states and approved by the EPA. The statute requires state implementation plans to include many techniques for achieving the primary and secondary standards, but I shall discuss only three: emission limitations, including schedules and timetables for compliance with such limitations; land use controls; and transportation controls.

The effectuation of emission limitations has obvious consequences. Immediately touched would be 200,000 industrial plants throughout the country—iron and steel mills, smelters, oil refineries, rubber and plastic plants, electric generating plants, paper mills, incinerators—plants which employ millions of people. The requirement that these plants comply with significant and meaningful emission limitations will inevitably result in the curtailing of production in some of these plants, and the complete closing down of others, with a consequent decrease in productivity and employment in certain spheres of activity.

Supreme Court Review

A question currently before the Supreme Court concerns whether the administrator of the EPA, in approving state implementation plans, must consider the economic and technological feasibility of emission limitations contained in the plans. The U.S. Court of Appeals for the Third Circuit, in St. Joe Minerals Corporation *v.* EPA (*3*), held, on 29 January 1975, that the EPA may not approve a state implementation plan containing sulfur oxide emission limitations which the EPA had concluded were not technologically feasible as applied to the petitioner's plant. This conflicts with decisions in other U.S. circuit courts: the sixth circuit, in Buckeye Power Inc. *v.* EPA (*4*), held that polluters "are not entitled to raise their claims of . . . technological infeasibility and resource unavailability prior to the administrator's approval of the state plans . . ." and the seventh and eighth circuits (*5*) have arrived at similar conclusions.

At the request of the EPA, the Department of Justice has asked the Supreme Court to review the decision in the third circuit case. Obviously, the impact of emission limitations will be greater, and more swift, if the EPA is not required, prior to approval, to review them for technological and economic feasibility throughout the region to which they apply.

Cost of Compliance

In any event, sooner or later, numerous categories of stationary sources of pollution will be required to spend, in the aggregate, hundreds of millions of dollars to comply with the limitations. The additional productivity and employment resulting from the design and manufacturing of pollution abatement control devices will probably more than equal the loss to the nation resulting from the closing of marginal plants. Although the gross national product may not be adversely affected, there will be dislocations in the economy on a local basis: in some areas inefficient old plants with large numbers of unskilled laborers will be extinguished; in other areas, offices and laboratories employing professional people in research and development activities will spring up.

Land Use Control

While the changes resulting from emission limitations are of obvious significance to labor and industry, the requirement in the Clean Air Act that state implementation plans employ land use controls to abate air pollution will, if meaningfully implemented, result in drastic changes in the way we live. Restrictions could be placed upon the location of shopping centers, parking lots, hospitals, recreation areas, housing developments, industrial plants, electric generating facilities, and countless other structures which either themselves generate air pollution or, by drawing large crowds of people for their use, increase the pollution resulting from automobile exhausts. The possible effect of such land use controls on the development of cities and industries cannot be overemphasized.

Of equal or even greater importance—since the automobile has so largely shaped American life-styles today—are the transportation controls authorized to be established by state implementation plans. In various states, transportation controls have included procedures governing the filling and storage of gasoline at gasoline stations; the inspection and maintenance of passenger automobiles, as well as of heavy-duty vehicles; the increase and improvement of mass transit; the initiation of improved traffic flow; the establishment of traffic lanes exclusively for buses and car pools; the institution of parking restrictions; the imposition of bridge tolls; the establishment of vehicle-free zones in urban centers; the prohibition against taxi cruising in certain areas; gasoline rationing; the requirement that existing vehicles be fitted with various pollution control devices; and banning of deliveries in various areas (*6*).

Thus, the social, economic, and demographic consequences flowing from the Clean Air Act, and the measures it requires the states to implement are, I believe, substantial and significant.

Balancing of Social Interest

Of course it may be that, as the potential for change inherent in the Clean Air Act becomes realized, the nation may decide that it cannot afford, or is not ready for, a transformation. Certainly, recent amendments to the Clean Air Act reflecting the decreased availability of low-sulfur fuel have gone in the direction of limiting or postponing the power of the administrator of the EPA to effect certain emission limitations and land use and transportation controls. The Energy Supply and Environmental Coordination Act (*7*), which was passed on 22 June 1974 to encourage the burning of domestic coal rather than imported oil, amended the Clean Air Act to require (i) a review of each state's implementation plan in order to determine whether the plan could be revised "in relation to fuel-burning stationary sources" without interfering with the attainment and maintenance of any national ambient air quality standard within the period permitted by the Clean Air Act; and (ii) to prohibit the administrator from *imposing* upon a state the requirement that an implementation plan contain parking surcharge regulations or regulations for the management of parking supply (although nothing would prohibit the state, on its own, from adopting parking surcharge regulations or regulations for the management of parking supply and submitting them to the administrator for his approval). These are relatively modest changes in the sweep of the Clean Air Act (*8*); at this very moment, the Congress has under consideration extensive amendments to the Clean Air Act. The direction these amendments go—whether they impose

more controls to abate pollution, or whether they lessen the impetus to change in order to accommodate the status quo—will substantially affect us all.

In discussing the pervasive effect of the Clean Air Act, I have limited myself to one section of the act and to three requirements only in that section—that emission limitations, land use controls, and transportation controls be effectuated within a state to implement ambient air quality standards established by the statute. I have not discussed the provisions of the statute relating to the siting of new stationary sources of air pollution—this alone a significant land use control—nor have I discussed the provisions relating to the control of automobile pollution through the development of improved internal combustion engines. The discussion of these provisions would only reinforce the point I have attempted to make, that the Clean Air Act necessarily does more than clean the air: it relocates industry, it changes centers of population, it alters life-styles and living patterns, and it touches immediately a broad range of interests, from the esthetic to the economic.

Cleaner than Clean Air

But there is one other requirement of the Clean Air Act that should be mentioned. Although this requirement is difficult to find explicitly set forth in the statute, the courts have found it to be in the statute implicitly, and it may have as profound an effect as any I have mentioned. The District Court for the District of Columbia, in a suit entitled Sierra Club *v.* Ruckelshaus (*9*), held that in those portions of the nation where the air is already of a quality higher than that required by the national ambient air quality standards, the air may not be permitted to deteriorate to the level of the national ambient air quality standards. This is called the principle of nondeterioration or nondegradation. The holding of the District Court for the District of Columbia was affirmed per curiam, that is, unanimously, and without an opinion, by the Court of Appeals for the District of Columbia. The matter was then taken to the Supreme Court, where the justices were divided equally, four to four (*10*), on the question (Justice Powell having taken no part in the consideration of the case). A consequence of an even division by the Supreme Court is the affirmation of the decision which it is reviewing; the nondeterioration principle, therefore, is today the law.

In what form the nondegradation decision will ultimately manifest itself is difficult to say. In compliance with the court decision, the EPA has issued regulations establishing the manner in which areas of the country having "cleaner than clean" air will be preserved (*11*), but these regulations are presently being challenged in the court by the Sierra Club and other environmental groups on the one hand and by the American Petroleum Institute, various oil companies, and the state of New Mexico on the other hand (*12*). In their most extreme form, nondegradation principles could operate so as to prevent industrial development of any consequence in those areas of the country (mostly the western states) where the air is now superior to that required by the national ambient air quality standards; new towns and cities in such areas might also be difficult to establish, as might be recreational areas, roads, and other activities that would draw automobiles. A consequence of thus freezing at their present level of development these "cleaner than clean" areas might be the confining of industry and population to those areas of the country which are now "dirty air" areas. Thus, we have another example of an environmental statute's impact going far beyond mere land and water.

Other Land Use Control Authority

In addition to administering the Clean Air Act, the EPA administers the Federal Water Pollution Control Act and a substantial number of other statutes. The Federal Water Pollution Control Act affects matters other than clean water just as fully and pervasively as the Clean Air Act affects matters other than clean air; one author commenting on one provision only of the act, section 208, observed that "it is difficult to imagine how a successful water pollution control strategy of this magnitude could be effective without extensive reforms in the state land use guidance system, or apart from other conservation, social, and economic objectives" (*13*). Clearly, the growth of almost any metropolitan area could be determined through the control of the size and location of sewage treatment plants and restrictions on hookups to these plants. It follows then that the agency that administers statutes of such comprehensive scope is itself an agency whose policies, like the statutes it administers, have an impact going far beyond the area suggested by the name of the agency.

Summary

It is clear that natural resource development and industrial expansion must be done so as to produce the least impact on our physical environment. Our energy requirements, along with the exigencies of life in modern society, demand adjustment and balance between pollution control and development. That adjustment will be made based largely on the political interests reflected in our communities, and where the pendulum will stop has yet to be determined.

References and Notes

1. *United States Code*, vol. 42, sect. 1857c-1 (1970), amending *ibid.*, sect. 1857c (Suppl. 1975).
2. ———, *ibid.*, sect. 1857b *et seq.* (1970), amending *ibid.*, sect. 1857 *et seq.* (Suppl. 1975).
3. *Fed. Reporter 2nd* **508**, 743 (3rd circuit, 1975).
4. *Ibid.* **481**, 162 (6th circuit, 1974).
5. Indiana and Michigan Electric Co. *v.* EPA, *ibid.* **509**, 839 (7th circuit, 1975); Union Electric Company *v.* EPA, *ibid.* **515**, 206 (8th circuit, 1975).
6. State plans are published in the *Federal Register*; each plan also appears in the *Code of Federal Regulations*. See *Code of Federal Regulations*, vol. 40, sect. 52 *et seq.* (1975). Following are two examples of provisions having the effect noted in the text:
   "No later than February 15, 1974, the City of Fairbanks shall prohibit the idling of all motor vehicles within the City unless attended by a licensed driver . . ." (Alaska's plan, *ibid.*, sect. 52.87).
   "Beginning June 1, 1975, the State of Maryland shall . . . establish a computer aided carpool matching system which is conveniently available at least to all employees of employers within the region who employ 100 or more employees" (Maryland's plan, *ibid.*, sect. 52.1104).
7. *United States Code*, vol. 42, sect. 1857c-10 and 1857f-6f (1974), amending *ibid.*, sect. 1857 *et seq.* (1970) (Suppl. 1975).
8. ———, *ibid.*, sect. 1857(b)(f) (1970) (Suppl. 1975).
9. *Fed. Suppl.* **344**, 253 (District of Columbia District Court, 1972).
10. *U.S. Rep.* **412**, 541 (1973).
11. *Code of Federal Regulations*, vol. 40, sect. 52.21 (1975).
12. Sierra Club *v.* EPA, civil No. 74-2063 (District of Columbia Court of Appeals, 1974); Sierra Club *v.* EPA, civil No. 74-2079 (District of Columbia Court of Appeals, 1974); Public Service Company of Colorado *v.* EPA, civil No. 75-1368 (District of Columbia Court of Appeals, 1975); Utah Power and Light Company *v.* EPA, civil No. 75-1369 (District of Columbia Court of Appeals, 1975); State of New Mexico *ex rel.* New Mexico Environmental Improvement Agency *v.* EPA, civil No. 75-1370 (District of Columbia Court of Appeals, 1975); Pacific Coal Gasification Company *v.* EPA, civil No. 75-1371 (District of Columbia Court of Appeals, 1975); Utah International Inc. *v.* EPA, civil No. 75-1372 (District of Columbia Court of Appeals, 1975); Indiana-Kentucky Electric Corporation *v.* EPA, civil No. 75-1575 (District of Columbia Court of Appeals, 1975); Dayton Power and Light Company *v.* EPA, civil No. 75-1663 (District of Columbia Court of Appeals, 1975); Buckeye Power Inc. *v.* EPA, civil No. 75-1664 (District of Columbia Court of Appeals, 1975); American Petroleum Institute *v.* EPA, civil No. 75-1665 (District of Columbia Court of Appeals, 1975); Alabama Power Company *v.* EPA, civil No. 75-1666 (District of Columbia Court of Appeals, 1975); Montana Power Company *v.* EPA, civil No. 75-1763 (District of Columbia Court of Appeals, 1975); Salt River Project Agricultural Improvement & Power District *v.* EPA, civil No. 75-1764 (District of Columbia Court of Appeals, 1975).
13. W. K. Reilly, in *Federal Environmental Law*, E. L. Dolgin and T. G. T. Guilbert, Eds. (West, St. Paul, Minn., 1974), p. 1431.
14. I thank Martin Green, special assistant to the Assistant Attorney General, for his help in preparing the original text of these remarks.