# INSTITUTIONAL CHOICE AND SOCIAL REGULATION: THE CASE OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH STANDARDS

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The institutional approach to policy analysis rests on the simple but important insight that individuals and groups pursue their goals in the policy arena not only by acting within the constraints set by the given institutional framework, but also by attempting to modify those constraints in their favor. The implications of this extension of the traditional model of rational choice, in which institutions are defined exogenously, are far-reaching. Policies which seem superior when judged by criteria relevant to the traditional approach, lose much of their attractiveness in the extended model.

In this paper I analyze some recent attempts to control environmental and occupational hazards in the United States and elsewhere. The purpose of the analysis is twofold. First, to show the importance of institution-changing strategies in the formation of regulatory policy. Second, to argue that the usual dichotomy of regulation versus deregulation or, more specifically, "standards" versus "price solutions", is a spurious one--an artifact, as it were, of the restricted model of social choice implicit in most policy analyses.

The fact that health standards are unsatisfactory tools of public policy does not prove that market solutions are necessarily superior in terms of criteria which are acceptable to the policy actors themselves. In fact, the suggestion that economic efficiency should be the basic criterion in choosing among policy alternatives exemplifies a particular type of effort aimed at institutional change--change in societal values.

1. The Trend toward Centralization of Control

During the 1970s significant changes have taken place in the way industrialized countries go about protecting the living and working environment of their citizens. Nowhere have these changes been more remarkable then in the United States. Here a series of important legislative enactments--in particular, the Occupational Safety and Health Act of 1970, the Amendments to the Clean Air Act passed in the same year, the Safe Drinking Water Act of 1974, the Toxic Substances Control Act of 1976, and the amended Clean Air Act of 1977--represent major shifts from previous models based on decentralized control and voluntary compliance, toward regulation at the national level by means of legally enforceable standards.

The significance of these institutional changes can be understood only in an historical context. The first federal law on air pollution control--the 1955 "Air Pollution Control--Research and Technical Assistance"--essentially provided grants-in-aid for state and local air pollution control agencies. The role of the federal government was largely confined to the provision of technical advice and assistance, and the collection and publication of air pollution information by the Surgeon General. The Senate Report on the law reflects the then prevailing philosophy of limited federal intervention in environmental matters:

> The committee recognized that it is primarily the responsibility of state and local governments to prevent air pollution. The bill does not propose any exercise of police power by the federal government and no provision in it invades the sovereignty of states, countries or cities. There is no attempt to impose standards of purity.(1)

The Clean Air Act of 1963 did little to establish a significant federal role in air pollution control other than assigning an important function for the federal government in identifying harmful pollutants. But Congressional attitudes had already changed by 1967, when a new Air Quality Act placed greater emphasis on federal regulation. The primary responsibility for setting air quality standards and for developing implementation plans to attain the standards "within a reasonable time" was still placed on the states; but now the Secretary of the Department of Health, Education, and Welfare (HEW) was authorized to develop standards and implementation plans for states that failed to comply. Financial incentives for the establishment of air quality standards applicable to interstate air quality regions were provided in the form of 100 percent coverage of the costs of planning such interstate programs for the first two years, and the payment of up to 75 percent of such costs thereafter. At the same time, the Secretary of HEW was granted exclusive authority to establish emission standards for new motor vehicles, except when a state had adopted stricter standards prior to March 30, 1966 (the obvious reference was to the state of California).

Despite great initial hopes, the actual results of the 1967 Act were disappointing. The root cause of the failure, according to many analysts, was the fact that the Act had left to the states the major responsibility for implementation of the law's requirements. The important Clean Air Amendments of 1970 represent the congressional response to the perceived inadequacies of previous legislation. While under the 1967 Act the states were supposed to adopt their own air quality standards, now the newly formed

Environmental Protection Agency (EPA) was required to develop and promulgate national ambient air quality standards for pollutants for which criteria--documents summarizing the available scientific information about the influence of air pollution in ill health and property damage--had been issued.

The states were required to develop state implementation plans (SIPs) to meet the air quality standards, and to do so by a "date certain"; if they failed, EPA would take over. To make sure that EPA would not evade the takeover requirement, the Amendements also provided for citizen enforcement: under section 304, citizens could sue EPA for not performing non-discretionary duties. Furthermore, the standard setting process was not to be delayed or watered down by cost or other non-health considerations. Section 5(g) of the 1963 Clean Air Act had proclaimed the necessity of giving "due consideration to the practicability of complying with such standards as may be applicable and to the physical and economic feasibility of securing abatement of any pollution proved..." (the same position had been taken in the Senate's report on the 1967 Act). Under the Amendments, however, health considerations would be sole determinants of air quality standards; and the standards were to be set at levels capable of protecting the most sensitive segments of the population.

In sum, EPA was to promulgate standards "with teeth", and the discretion of state and local agencies in implementing them would be severely limited by the requirements that acceptable SIPs be submitted to EPA. But this apparently logical division of responsibility concealed a serious danger for EPA. If the agency wanted to avoid assuming directly the financial and political costs of implementation (a fear which had already haunted the U.S. Public Health Service back in the 1950s, when discussion of air pollution abate-

ment was still in its infancy), it had to bargain with the states rather than taking over their functions. And in order to bargain effectively, a certain amount of flexibility was needed regardless of legislative intent. This explains why considerations of economic and technical "feasibility" were included in the EPA guidelines for SIPs, despite the fact that Congress had explicity denied the relevance of factors other than health in setting air quality standards. In this softening of the implementation guidelines EPA or, rather, the agency's first administrator, William D. Ruckelshaus, found a strong ally in President Nixon's Office of Management and Budget.(2)

The new Clean Air Amendments of 1977, while not including any major departures from previous legislation in this area, gave expression to a growing dissatisfaction with social regulation, and to new preoccupations created by the energy crisis. In the words of the Senate report, the new law attempted "to balance the economic aspirations of the country with the need for protection of the public health and welfare from the adverse impacts of air pollution".(3) The House report was equally explicit in stating the need for considering economic factors in determining acceptable levels of air quality. The health-only rule of 1970 had become an ambiguous "balancing rule" seven years later.

By the summer of 1978 EPA was exposed to strong pressures, coming from such bodies as the Council of Economic Advisers and the newly-formed Regulatory Analysis Review Group, to cut the costs of proposed health, safety and environmental regulations. The difficulties of setting health standards with less than adequate information were also becoming increasingly clear. Industry spokesmen and even some independent researchers challenged existing

standards, such as those for $SO_2$, on the ground that the scientific evidence was inconclusive. EPA's understandable response was one of increasing risk aversion. For example, the agency began to issue warnings that the research needed for setting a sulfate standard could not be completed by 1980 or 1981, as originally expected, and that, consequently, a standard might not be promulgated until 1983 or later.(4)

Legislative and administrative developments in the area of water pollution control follow a rather similar pattern, and will be mentioned only briefly here. Prior to the passage of the Safe Drinking Water Act of 1974 truly national standards for water quality did not exist in the United States, since regulation of intrastate drinking water quality was the responsibility of individual states. The findings of the National Water Commission Report of 1973 concerning serious inbalances in state and local regulations (so that, for example, people living in large cities usually had drinking water of higher quality than people in smaller communities), and the presence of potential human carcinogens in many drinking water systems revealed by a survey conducted by EPA in 1974, led to the demand for national regulation of drinking water quality. As the National Water Commission Report noted, there was a "need for a comprehensive restatement of policy to govern the role of the federal agencies meeting the nations's needs for municipal and industrial water supplies".(5)

Inadequate statutory authority, lack of centralized administration and of forceful enforcement, large interstate differences in drinking water standards: these were the problems Congress attempted to solve with the 1974 Act, and the promulgation, by EPA, of National Drinking Water Regulations. But again, as in the case of air pollu-

tion control, it soon became clear that the federal government had to rely primarily on informal negotiations with state and local authorities, rather than on rigid enforcement of national standards. However, the physical characteristics of water pollution problems--the fact that such problems are generally well defined by a river bed which touches many communities, so that failures to implement controls on the part of one local agency become immediately apparent to all other agencies downstream--have made coordination among different jurisdictions somewhat easier than in the case of air pollution control.

2. The OSH Act of 1970

The Occupational Safety and Health Act (OSH Act) is the first comprehensive attempt by the federal government to assure safe and healthful conditions for American workers. Prior to the passage of the Act, the federal government's involvement in the regulation of occupational health and safety was limited to certain industries (e.g., mining, construction, and maritime), and certain businesses with federal contracts; the primary regulation of industry was at the state level.[6] As in the case of environmental regulation, Congressional action was in response to widespread claims of ineffectiveness of state enforcement, and to the lack of uniform safety and health standards.

The administrative agency responsible for administering the provisions of the Act is the Occupational Safety and Health Administration (OSHA), located within the Department of Labor. OSHA is required to set occupational safety and health standards, and to conduct inspections at workplaces to ensure compliance with the standards and with the "general duty" obligation of employers in

all cases not covered by specific standards.

Two more agencies have been established under the OSH Act: the Occupational Safety and Health Review Commission, a quasi-judicial review board which rules upon all challenged enforcement actions of OSHA; and the National Institute for Occupational Safety and Health (NIOSH), a research body located within the Department of Health, Education, and Welfare. NIOSH is responsible for developing occupational safety and health standards and recommending them to OSHA, for conducting research in occupational health and safety, for training of personnel to enforce the Act, and for conducting risk evaluations. The agency is specifically required to publish a list of all known toxic substances and the concentrations at which these substances exhibit toxic effects.

OSHA may promulgate a standard on its own initiative, in response to the petitions of employees or employers, or in response to the recommendations of NIOSH. It is interesting to note that from about 1940 to the passage of the OSH Act, private organizations such as the American Conference of Governmental Industrial Hygienists (ACGIH) played the major role in the development of occupational health standards in the United States and, indirectly, also in West Europe. The ACGIH's Threshold Limit Values (TLV) Committee, made up of nationally recognized toxicologists, industrial hygienists, and other experts not employed by private industry, has published lists of maximum acceptable concentrations (MAC) for hundreds of toxic substances. Though the occupational standards derived by the ACGIH were presented only as voluntary guidelines for industry their influence on the development of industrial hygiene in the United States and abroad has been enormous. As one toxicologist writes:

> For nearly 35 years the ACGIH provided the leadership and council necessary to improve working conditions in the United States and many foreign countries. In fact, many western countries have adopted, almost in toto, the recommendations of the ACGIH. In 1971 OSHA promulgated the recommended TLVs of the ACGIH into law in the United States.(7)

This is not to say that the methodology used by the ACGIH was wholly satisfactory. The recommended standards depended to a certain extent on professional judgment and confidential data, while documentation was often inadequate (although the situation had been improving, in this and other respects, after 1962). According to some experts, as late as 1968 24% of all TLVs published by the ACGIH were based on analogy.(8) It was hoped that the OSH Act would be of decisive help in improving standard-setting methodology, as well as providing the first opportunity to develop uniform and legally enforceable national standards.

State regulation, however, was the main target of the critics, especially labor unions and public-interest groups. Lack of sufficiently trained personnel and of research facilities, bureaucratic inefficiency, "capture" by business interests, and reliance on simple warnings, rather than first-instance citations, in case of violation of occupational safety and health standards, were the most frequently mentioned failures of state regulation prior to the passing of the OSH Act. Hence, "[m]andatory standards,..., an informed and strong enforcement force, and a greater emphasis on occupational disease were seen to be necessary components of a sincere federal effort to reduce industrial accidents and disease. The embodiment of this effort was the Occupational Safety and Health Act of 1970".(8)

The issue of state participation loomed large in the first

years after the passage of the Act. In 1972, the President's Report on Occupational Safety and Health had pointed out that "the purpose of the act is not to eliminate State safety and health programs but to include the States as major participants in the implementation of the Act as clearly stated in the 'Congressional Findings and Purposes'".(9) In fact, Section 18(b) states:

> Any State which, at any time, desires to assume responsibility for development and enforcement therein of occupational safety and health standards relating to any occupational safety or health issue with respect to which a Federal standard has been promulgated under section 6 shall submit a State plan for the development of such standards and their enforcement.(10)

Section 23(a), (b), (f), and (g) provides that the federal government may pay up to 90% of the cost of developing state plans, and up to 50% of the cost of administering them.

The conditions which a state plan must satisfy in order to be approved by the Secretary of Labor are listed in considerable detail on section 18(c). One of the most significant conditions is that state standards "are or will be at least as effective in providing safe and healthful employment" as the federal standards. Also, state agencies are required to supply any information required by OSHA. Under section 18(f), the Secretary of Labor must make a continuing evaluation of the state plan, retaining the right to withdraw approval for cause after affording a state adequate notice and an opportunity for a hearing.

By mid-1975 all states but five had submitted plans for consideration, and 22 state plans had been approved. It has been suggested that such a widespread submission of state plans may have been stimulated by industry opposition to the Act, and by

President Nixon's "New Federalism".[12] Organized labor feared a new state takeover. As AFL-CIO President George Meany wrote in 1974,

> Unless this regressive process can be stopped, every American worker covered by this Act will witness a return to the situation which caused the Act to be passed in the first place--a fragmentized, weak-kneed and wavering decentralized system, impossible to police, becoming progressively more impotent as big and small business pick it to pieces at the state level.[13]

As I shall argue in section 4, it is doubtful that this was a correct analysis of the situation. After passage of the Act, the structure of the incentives of the major policy actors had changed. Industry, in particular, no longer needed to concentrate resources on gaining influence at the state level. OSH Act contained a number of provisions which could be skillfully used to slow down federal action. In fact, if state control of occupational health matters was so important to industry, how can we explain that four major industrial states (New Jersey, New York, Illinois, and Wisconsin) had withdrawn plans previously underway in the first six months of 1975, and that five other states (including Georgia and Pennsylvania) had done the same prior to 1975? It seems more reasonable to suppose that the 50% funding provided by the Act did not seem sufficient to the states to compensate for the technical and political difficulties of implementing mandatory occupational health standards.

The OSH Act has been characterized by George C. Guenther, former Assistant Secretary of Labor for Occupational Safety and Health, as "essentially a labor standards law...its heart is the development and enforcement of safety and health standards".[14] Consequently, an analysis of the Act is, to a large extent, an

analysis of the role of standards as tools of occupational health policy. In a policy context, the two key questions are: (a) who should set and implement the standards?, and (b) how should the standards be set?

On the first issue there had been considerable debate in Congress prior to passage of the Act. In House and Senate bills introduced in August 1969 and again in September 1970, the Republicans had proposed that authority for setting and enforcing standards be vested in a new National Occupational Safety and Health Board, whose members were to be appointed by the President. According to Democratic bills introduced in January, 1969 and in March 1970, the Secretary of Labor should set and enforce standards. In December 1970, a joint Senate and House conference committee worked out a final version of the conflicting bills. Since unions have traditionally considered the Labor Department their natural ally in Washington, the jurisdictional issue was of the utmost importance to them. According to the Nader report, "the pressure from the unions bore down on the issue of who should set the standards. Before the conference had begun, the union representatives...had decided that what they wanted above all else was that the Department of Labor, and not a board, set the standards. In order to reach this goal, the unions were willing to make certain concessions...".[15] In the resulting compromise, the Secretary of Labor was given standard-setting and enforcement authority, while a quasi-judicial Occupational Safety and Health Review Commission received authority to exercise final administrative review of enforcement cases. According to section 12, (a) and (b), of the Act, the Commission is composed of three members appointed by the President for terms of six years.

The second issue, concerning the substantive criteria to be used in setting standards, received much less attention in the phase preceding passage of the Act. Under section 6(b)(5) a standard for a toxic material must be set at the level.

> which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life...In addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws.

This is the only place in the statute where the "feasibility" requirement appears. According to Doniger,[15] the requirement was added to section 6(b)(5) by the Senate Committee, on the suggestion of Senator Javits. In his individual views attached to the Report, the Senator explained:

> As a result of this amendments, the Secretary, in setting standards, is expressely required to consider feasibility of proposed standards. This is an improvement over [the section in the absence of the amendment], which might be interpreted to require absolute health and safety in all cases, regardless of feasibility...[17]

The appropriateness of the term "feasibility" in this context is highly debatable, but the comments of Senator Javits make clear the real purpose of the clause--to induce OSHA to consider the costs of regulation in setting health standards.

In view of the precedents (e.g., section 5(g) of the 1963 Clean Air Act stating the necessity of giving due consideration to the "physical and economic feasibility of securing abatement of any pollution proved"), it seems unreasonable to argue, as Ashford does, that the feasibility requirement in the OSH Act probably meant only technological feasibility.[18] Rather, the

intentional ambiguity of the language has provided many possibilities for administrative discretion, and for legal opposition by vested interests to proposed health standards. In its first 10 years of existence, OSHA has promulgated only ten new health standards. No carcinogen standard has been issued after the benzene standard was struck down by the Court of Appeals of the 5th Circuit on October 5, 1978.

## 3. A Model of Institutional Choice

The brief historical description of the two preceding sections reveals a common pattern of development in environmental and occupational health policies. The advocates of an expanded federal role in these areas (public-interest groups, organized labor, some political entrepreneurs, and segments of the federal bureaucracy) have succeeded in bringing about major shifts in statutory authority from state and local agencies to the federal level. Yet the fruits of this victory have proved to be disappointing. Federal agencies (OSHA and EPA) have been forced to assume a greater share of the political and financial costs of implementation than was originally envisioned. Despite initial hopes of great methodological progress, standard-setting still remains an art rather than a science. Finally, federal standards, though legally enforceable as demanded by unions and public-interest groups, have been few in number and weakened, moreover, by "feasibility" requirements and lack of adequate scientific support.

In this and the following section, I shall argue that such results can be explained in terms of a simple conceptual model of institutional change. The axiom on which the model is based is that rational policy actors do not take the institutional frame-

work as given, but pursue their self-interest also by devoting resources toward obtaining favorable institutional changes.

It is important to realize that this intuitively appealing assumption is foreign to conventional policy analysis. The generally accepted model of rational choice in microeconomics and decision theory can be succinctly described as follows: a decision maker possessing certain resources and faced by an exogenously given set of constraints, chooses from the set of feasible alternatives the one that maximizes his utility function. In Paretian welfare economics, choice situations facing an entire society are modelled in an analogous way: the policy maker attempts to maximize a social welfare function $W = W(U_1, U_2, \ldots, U_n)$ which depends positively on individuals' utility levels, $\partial W/\partial U_i > 0, i = 1,2,\ldots,n$, subject to a transformation constraint T relating the goods and production factors on which the individual utilities depend. Maximization of W subject to the condition $T = 0$ specifies the welfare optimum in terms of the amount of each factor to be provided by each person and the volume of each good to be consumed by each person. In this view, maximization of welfare is the goal of policy; manipulation of constraints on individual choice is the method used by the policy maker. Thus, in the traditional theory the rules defining the constraints within which private transactions take place are determined exogenously. As James Buchanan has pointed out, no bridge exists between the economic behavior of the individuals and groups affected by the rules, and their behavior as participants in the political process that produces the institutional constraints.

But this model overlooks the crucially important fact that in pursuing their goals, people not only act within a given set

of constraints, but will also strive to modify those constraints in their favor, using whatever means are available to them (within limits set by higher-order constraints). This is the basic insight on which a more realistic theory of institutional choice may be built--a theory in which individuals and groups are not artificially separated from the decision processes that set constraints on their behavior.

In order to understand a particular process of institutional choice (such as the passage of an environmental law, or the setting of health standards), and perhaps to forecast its likely outcomes, it is necessary to analyze in detail (a) the set of policy actors, (b) their resources and constraints, and (c) the amount of information--including ideologies and cognitive paradigms--that is available to them.

As Victor Goldberg has shown[19], useful insights can be obtained even under the simplifying assumptions that policy actors either act independently or in monolithic coalitions; that they have a single, homogeneous resource (say, money) to allocate toward influencing institutional choice; and that the information available to any actor concerning the consequences of a given institutional change is both imperfect and taken as given. Under these assumptions, one can conclude that each actor will allocate his scarce resources in such a way that the expected marginal return of the last unit of resource spent on influencing institutions in any particular policy area (or in any particular jurisdiction) will be roughly equal to the benefit of the last unit of resource spent an any other type of influence, and of the marginal investment on any good.

As the above assumptions are relaxed, more complex patterns of group behavior can be incorporated in the model[20]. Consider first the assumption that interest groups act as a single individual in pursuit of their goals. In fact, we know that collective action is always faced by the "free rider" problem. A group goal such as safer working conditions, represents a public good which benefits all employees, regardless of union membership. Similarly, a better environment benefits every person living in a given area, again independent of his or her direct contribution to environmentalist causes. In this way, actual or potential group members have incentives to be free riders. If the amount of resources available to a group depends significantly on its ability to induce or coerce its members to contribute to the common goal, the group leadership will try to obtain rules facilitating joint action on certain issues. For example, unions may attempt to obtain legislation making safety and health issues mandatory subjects for collective bargaining. Again, the possibility of class-action suits against polluters, or against employers in the field of occupational health, facilitates collective action by reducing the cost of using the courts to enforce claims. An important institutional change, like the passage of the OSH Act, may even create opportunities around which new forms of collective action can be organized.

Consider now the nature of the resources available to the policy actors. In the policy arena many resources other than money (e.g., votes, political influence, expertise, and information) are important; moreover, these resources are unequally distributed among the different actors. Less widely appreciated is the fact that the comparative advantage which various types of resources give to their owners depends on institutional factors. Any given

institutional framework tends to favor some resources more than others. For example, environmental and occupational health regulation affects the nature of property rights, reducing the power of capital relative to other resources such as political influence. Rule changes can also create new resources, for example, financial support for public participation in regulatory proceedings, or membership in advisory committees and administrative bodies. Hence policy actors will attempt to achieve institutional changes that give them new resources, or reward those with which they are relatively well endowed.

The problem of the information available to the policy actors remains to be discussed. Information is both incomplete and unevenly distributed. In the words of N.A. Ashford,

> Inequality of access--for example, between management and labor or between large firms and small ones--creates incentives for special interests to withold or distort potentially damaging (or beneficial) information. Differential access converts information into a bargaining advantage for the more knowledgeable party, and compounds the difficulties of public and private decision-makers who must evaluate the merits of a bewildering variety of conflicting claims. Thus the phenomenon of differential access to information transforms the problem of improving our understanding from the purely scientific and technical realm of information generation, dissemination and utilization, to the "political" arena.(21)

It follows that policy actors have an incentive to invest resources in restructuring the institutional channels through which information is collected, evaluated, and disseminated. For example, the ability to influence the institutional setting or the composition of research bodies and advisory boards may significantly affect the kind of data that are collected, and the way in which they are evaluated. In some cases, even the choice of rules of evidence may become crucially important.

Thus, in the case of toxicologic or epidemiological evidence relevant to standard setting, strict standards of scientific proof imply that fewer exposure limits can be determined while, at the same time, making legal challenges easier. For this reason, advocates and opponents of regulation tend to support different rules of evidence.

As Victor Goldberg has suggested, the self-interest model of institutional change can be extended to include efforts to alter cognitive paradigms and cultural values. Health regulation again provides many examples. Thus, whether or not safe thresholds for carcinogens and other toxic substances exist is not a question that can be definitely settled on the basis of available scientific knowledge. In fact, it is doubtful that the issue will ever be settled for, in the last analysis, the answer depends on one's views concerning the degree to which the defense mechanisms of the body can be safely drawn upon to offset insults from toxic agents. According to what is probably the prevailing opinion among toxicologists in the West, no threat to health exists so long as the exposure does not induce a disturbance capable of overloading the normal protective mechanisms of the body. However, some industrial toxicologists in the West, and the majority of Soviet scientists, maintain that a potential for ill health exists as soon as the organism undergoes the first detectable change from its normal state.

Neither position can be dismissed in favor of the other as being either unreasonable or contrary to established biological laws, but the practical implications in terms of acceptable levels of exposure are vastly different in the two cases.[22] Individuals and groups favoring the adoption of very strict health standards support the view that no safe levels of exposure exist (and ge-

nerally also a "health only" approach to standard setting), while people concerned with the costs of regulation stress the adaptability and resilience of the human organism. The step from scientific and policy disagreements to general philosophical opposition can be surprisingly short. Thus, a well-known American toxicologist, opposed to a "no threshold" approach to standard setting, argues that to keep concentrations of environmental agents below one's level of perception may produce

> a creature [that] would have a Faustian life span but [one that] could receive no new knowledge, an existence barely removed from that of the amoeba in its ability to experience the world around it ... It seems that man is destined to fail and challenge, to perceive and appreciate his world, but at the cost of mortality. Otherwise, what an immortality, what a life! (23)

Since very concrete regulatory decisions may depend on basic philosophical attitudes, it is not surprising that policy actors allocate resources toward altering societal values and beliefs. In Goldberg's words, "the cultural milieu is not completely exogenous". (24)

## 4. The Model Applied

The legislative histories outlined in sections 1 and 2 above offer a wealth of interesting material to which the model of institutional choice may be applied. Here I can do little more than to suggest an interpretation of the OSH Act and its implementation. In the next section possible alternatives to the regulatory philosophy embodied in the Act will be discussed.

In the arena of occupational safety and health the major actors are: federal and state bureaucracies, industries and their trade associations, local and national public-interest groups, local and national labor organizations. On some issues, academic experts

as well as governmental and industrial toxicologists have played a significant role. National labor organizations were probably the most determined opponents of state regulation. The reasons of this opposition have been conveniently summarized by Ashford:[25]

> (1) The national unions will not be able to exercise sufficient influence at the state level, since (a) management organizations are relatively more powerful there, (b) local unions lack the expertise and manpower to be active, and (c) grassroots worker support for occupational health and safety issues is just beginning to be significant, but the effectiveness of local leadership does not yet compare to that of the more policy-oriented national union leadership. (2) The poor record of the states prior to the OSH Act gives support to the belief that the states will not do a good job. (3) Whatever the arguments are for state takeover with regard to safety, the states do not have the research capability necessary to tackle the more severe and prevalent occupational health problems.

National union leaders are well aware of the difficulties of achieving safety and health benefits through collective bargaining. Issues concerning working conditions tend to have low priority in the bargaining agenda since financial gains are of more immediate interest to workers and their local representatives. Hence, federal legislation in this area strengthens the position of the union leadership with respect to the rank and file and to the unorganized members of the workforce. The following statement made by one union leader in an interview with John Mendeloff[26] is quite revealing:

> The restraints on collective bargaining are very obvious; we don't have the power to get that stuff from management. Collective bargaining could be used more, but people tend to see themselves as impotent. OSHA helps to focus on the problem; how else could you get national attention to the problem of setting a level for some new material like vinyl chloride?

This explains why by 1970 a bill on occupational safety and health had become one of the top legislative priorities of union

leadership. Moreover, since regulation in this field was to be done mostly by means of standards, it was important that standard-setting authority be vested in a federal agency which labor viewed as "its" department, namely the Department of Labor. As mentioned in section 2, organized labor was successful also on this score. Activist groups such as Ralph Nader's Health Research Group, and the Environmental Defense Fund fully shared labor's doubts about the willingness and capability of the states to provide adequate protection in the area of occupational health. The notion of giving priority to the quality of working conditions over the traditional wage goals of collective bargaining was also very much in line with the basic philosophy of the environmental movement. In addition, the shift of regulatory authority from the state to the federal level would produce significant economies of scale in the acquisition of influence by such means as lobbying and negotiations. Since some minimum threshold expenditures (e.g., to hire a professional staff) must be made before effective action becomes possible, national public-interest groups have a clear interest in concentrating their efforts in Washington, rather than diluting them in 50 state capitals.

Finally, both labor and activist groups felt that the expertise available to industry in occupational health and safety could be matched only by a heavy presence of the federal government in this area. On a number of occasions, representatives of organized labor and activist groups have expressed the need of compensating the limited research capabilities of their organizations by greater reliance on federal research institutions. The OSH Act seemed to offer a number of interesting possibilities in this direction, through the creation of a National Institute for Occupational

Safety and Health (NIOSH), and of advisory bodies whose membership includes representatives of labor and of the public.

Traditionally, business groups have vigorously opposed any direct federal role in matters of safety and health in the workplace, arguing that this is a state function. It has already been indicated (see section 2) that prior to the passage of OSH Act in 1970, occupational health standards were mostly developed by unofficial groups like the American Conference of Governmental Industrial Hygienists and the American National Standards Institute, and voluntarily adopted by industry as "consensus standards" or guidelines for good engineering practice.

OSH Act has changed the concept of occupational health standards in three significant ways. First, the national standards are now legally enforceable. Second, standards promulgated by OSHA are no longer expressed only in terms of exposure limits but include sampling techniques, reference analytical methods, medical examinations, labeling of hazardous containers and areas, work practices for hazard control (including the use of protective equipment and clothing), apprisal of employees of hazards to which they are exposed at the workplace, monitoring and record keeping of environmental sampling, and medical examination results. Finally, recommended standards must be based on publicly available information that may be evaluated by anyone, including union representatives and other interested parties.[27]

Clearly, such changes imply heavier costs for industry; stricter regulations amount to a significant redefinition of property rights. Yet, industry's interest in mounting a determined resistance to a federal takeover should not be exaggerated. For one thing, even the old decentralized system of regulation was becoming increasingly

stringent. Pressures from ACGIH and other professional groups, and from the states, to reduce to a minimum worker exposure to carcinogens and other toxic substances had been increasing since the early 1960s. Thus, in 1961 beta-napthylamine was banned by the Commonwealth of Pennsylvania, and in 1967 regulations were issued requiring that a permit be obtained from the Commonwealth's Department of Health for industrial operations involving potential exposures to certain substances.[28] Also, interstate variations in the stringency of regulation threatened to introduce unfair competitive advantages for companies located in certain states, while complicating the administrative problems of compliance for firms operating in several states.

Most importantly, industry must have realized, more clearly than anybody else, the enormous difficulties of setting and implementing defensible occupational health standards. The basic difficulties are of two types. First, the lack of a firm scientific foundation on which such standards could be based. For example, procedures used by toxicologists to determine "virtually safe doses" (VSD) for exposure to carcinogens involve extrapolations downward from the range of observed effects. A variety of equally plausible mathematical functions may be used in the extrapolation procedure, but the choice of function has a major effect on the determination of the VSD--more than 100,000-fold according to estimates of the Advisory Committee on Safety Evaluation of the U.S. Food and Drug Administration.[29] Equally uncertain is the relevance of animal experiments for the determination of human carcinogenic risks.[30]

The second difficulty concerns the very nature of standards as policy tools. Voluntary standards and guidelines, such as those issued by the ACGIH and by NIOSH, can be determined on the basis of

"health only" criteria, since they are not meant to be regulatory instruments, but rather supply scientific inputs to subsequent decisions. Mandatory standards, on the other hand, are policy tools and as such must include, more or less explicitly, considerations of costs and benefits. Typically, estimates of economic impacts will be at least as uncertain as estimates of safe dose levels and other biological parameters.

To take full advantage of the possibility for dilatory tactics inherent in the scientific and economic uncertainties, industry needed only a few and apparently minor changes in the language of the statute. One such change was the "feasibility" requirement added to section 6(b)(5) of OSH Act by the Senate Committee, on the suggestion of Senator Javits (see section 2). Other procedural requirements, like the publication in the Federal Register of proposed standards, and the possibility of petition for judicial review, can also be effectively used to delay regulatory action. The results have been mentioned already. In ten years, OSHA has promulgated only ten health standards: three between 1970 and 1974 (asbestos, vinyl chloride, and a group of 14 carcinogens), one in 1976 (coke ovens), and six in 1978 (lead, arsenic, DBCP, cotton dust, acrylonitrile, and benzene).

For example, in the case of the vinyl chloride (VC) standard set in 1974, industry opposed the proposed level of 1 part per million (1 ppm) on the grounds that OSHA lacked sufficient evidence on the harmfulness of VC at low doses; that it was technologically impossible for plants producing VC to meet the 1 ppm ceiling; and that the cost of approaching the ceiling would force the companies out of business. Conceding the industry's claims of infeasibility, OSHA finally promulgated a somewhat weakened permanent standard.

Subsequent experience was to show that meeting the 1 ppm standard was not as difficult or costly as industry had predicted.

The convenient elasticity of the feasibility requirement has been aptly described by David Doniger in a detailed case study of the VC standard: "OSHA's statements and actions suggest that it was following an unarticulated principle that a standard is not feasible if it would cause more than slight changes in the number of firms in an industry, or in an industry's profit and growth rates, its output, and competitive position".(31) According to Ashford, even NIOSH, which is supposed to base its recommendations exclusively on the "best scientific judgment", objectively determined, sometimes recommends criteria at variance with what is suggested by the scientific evidence alone.(32)

A number of trade associations watch closely OSHA's activities: The American Industrial Health Council, an organization expressely created for the OSHA rule making, the Society of Plastic Industries, which has been particularly active in opposing the VC standard, and the American Petroleum Institute, the organization which defeated OSHA on the benzene standard. No carcinogen standard has been promulgated after the benzene standard has been invalidated by the Court of Appeals for the 5th Circuit on October 5, 1978. The standard was struck down because the court found that OSHA had failed to make quantitative estimates of the benefits of the standard, and weigh them against the costs to see if the balance was "reasonable".

What about the position of the regulatory bureaucracy? An expanded federal role in the area of occupational safety and health means, of course, an increase of budget, employment levels, and political power for the federal bureaucracy. However, it was not difficult to guess that the financial and political costs of im-

plementing occupational standards were likely to be high. There were precedents. In the case of air pollution control, for example, HEW's Public Health Service had been unwilling, back in the mid-1950s, to become involved with the problems of abatement and control. "The health service apparently realized that any efforts to determine adverse levels of air pollution would lead to controversy, especially if it would have a role in recommending air quality or emission standards."(33)

The prospects for the enforcement of occupational health regulation must have been even more alarming. Consequently, the possibility given by OSH Act to the states to develop and enforce their own standards, under OSHA's supervision, was compatible with the interest of the federal bureaucracy. According to Ashford, by early 1974 OSHA policy was "to shift to monitoring of state plans rather than continuing Federal enforcement activities upon commencement of enforcement by states with operational approved plans."(34) It is easy to see that from OSHA's point of view this was an optimal strategy, since it minimized the agency's political costs.

According to Section 18(c) of the Act, acceptable state plans must meet a number of specifications whose purpose is to ensure that state standards and implementation procedures (including right of entry and inspection without prior notice) be "at least as effective" as federal standards and procedures. Once a state plan has been approved, the Secretary of Labor is required to make a continuing evaluation of the state's performance, and to withdraw approval for substantial failure to comply; OSHA provides 50% of the funds necessary to run the state's program. In this way, all the political and half of the financial costs of implementation could be shifted to the states. At the same time, labor unions and

public-interest groups were told that a state's standards and enforcement procedures would go just as far as federal efforts toward reducing accidents and deaths in the workplace.

The vagueness of the statutory language in connection with the approval of state plans increases OSHA's bargaining position with respect to state bureaucracies. Interpretation of the "at least as effective" requirement is necessarily subjective, even when applied to such specific items as exposure levels and number of inspectors. In the case of the "general duty" clause it becomes practically impossible to determine objectively whether state performance is at least as effective as federal performance. Consequently, the monitoring system gives a great deal of discretionary authority to OSHA and in particular to the Assistant Regional Directors for Occupational Safety and Health.(35)

Not all states have been eager to grasp the possibility for independent regulation offered to them by Section 18 of OSH Act. Major industrial states like New York, New Jersey, Illinois, and Pennsylvania have chosen to withdraw plans previously submitted. Only 23 states operate today under OSHA-approved plans. Like EPA in the case of air pollution control(36), OSHA has been forced by the logic of the situation to unwillingly exercise its power and to become the target of sharp criticism coming from management, labor, activist groups, and even the Council of Economic Advisers.

## 5. EVALUATION AND NORMATIVE IMPLICATIONS

Recognizing the role of self-interest in the formation of public policy is a source of insights, but also of potential misunderstandings. There is a real danger that an analysis of policy development in terms of the self-interested behavior of the actors may be interpreted as a mere rationalization of the prevailing power relations. Actually, the model of institutional choice contains no implication that the interaction of constrained self-interests will necessarily result in socially acceptable solutions. On the contrary, our preceding discussion shows that the resulting outcomes may be unsatisfactory for most or all of the actors -- though for different reasons. What the model does imply is that normative recommendations should not be based on assumptions of ideal behavior of individuals and organizations, but on the realities of the policy process.

In this spirit, I shall briefly evaluate the regulatory approach embodied in the OSH Act and much recent environmental legislation in the United States, and then proceed to sketch some possible alternatives. Since the current approach relies so heavily on mandatory standards, the basic evaluative issue concerns the limitations of standards as regulatory tools. Our analysis indicates the following structural defects:

- Given the level of scientific knowledge available today or in the foreseeable future, the numerical precision of current standards is spurious. What is worse, the present cumbersome process of standard setting does not allow the frequent revisions which new evidence would require. For example, shortly after OSHA set the "permanent" standard for vinyl

chloride at 1ppm, new information became available that cancer had been induced in animals at precisely that level. But with 1,500 to 2,000 known or suspected carcinogens yet to regulate, OSHA could hardly be expected to immediately reopen the VC proceedings.

- The most significant long-term effect of toxic substance and other occupational health standards should be to channel growth away from industries and materials that are hazardous to health, and towards safer forms of employment. Instead, under the pressure of "feasibility" requirements and "inflationary impact statements", there is a growing tendency for standards to merely codify existing technical and economic conditions. Moreover, since OSHA and other regulatory agencies rely on informal procedures in combining scientific evidence with economic and other considerations, the logic of the entire standard-setting process becomes opaque. In particular, no well-defined meaning can be attached to the chosen levels of exposure.

- Mandatory standards focus the attention of operators and inspectors on a small set of permissible values and approved practices, at the expense of more comprehensive assessments of the overall quality of ambient or workplace environment. The logic of statutory control is such that it is difficult to differentiate between the important and the trivial, between form and substance. With no formal place for discretion in technical interpretation, the situation becomes one of either compliance or breach.

- Yet flexible interpretation is crucially important, particularly since few standards take synergism in chemical and environmental interactions into account. Since many health problems are apparently caused by combinations of various toxic substances, and by their interactions with environmental conditions and behavioral patterns, regulation of individual substances may represent an unproductive approach. At the same time, the enormous number of possible synergistic relationships rules out the possibility of complete coverage through formal regulation.

Many critics of the OSHA approach to regulation have used the inadequacies of the current system of mandatory standards as proof of the need to reduce governmental intervention, and to place greater reliance on economic incentives. It has been suggested, for example, that employers be induced to provide safer workplaces by means of an "injury tax" (in the form of a certain percent surcharge of an employer's total injury loss) which would raise the marginal benefits of injury prevention. This critical literature has its counterpart in the area of environmental problems. Here, too, the administrative approach to pollution control, based on standards and prohibitions, has been criticized for its lack of effectiveness, and for its tendency to become "a political process entailing bargaining between parties of unequal power".(37) Effluent charges and related price-based techniques have been proposed as alternative approaches that by their automatism "would reduce the scope for administrative discretion and bargaining".(38)

But these normative conclusions overlook one important point. The same forces that influence and distort the standard-setting process will also affect other approaches, perhaps by different means. The comparison between an uncorrupted system of effluent charges (or injury taxes), and a regulatory machinery captured by interest groups is a specious one. In fact, where effluent charges have been used, as in France, they have proved to be as subject to bargaining and as conditioned by institutional changes as standards, licenses, and other administrative measures.(39)

There is no reason to believe that market-oriented approaches to occupational safety and health would fare better. At any rate, solutions that are (theoretically) more efficient will also be more desirable only to the extent that economic efficiency is accepted as the overriding criterion of public policy. Such general acceptance is lacking in the policy areas discussed in this paper. Our analysis clarifies the reasons for this. Policy actors realize that the choice between standards and prices is not a technical choice between policy tools which are in themselves neutral, but rather a decision between alternative institutional frameworks which reward different groups differently. Hence some actors may, without being inconsistent, recognize that standards are less efficient than economic incentives, but at the same time support an inefficient regulatory machinery in which they have a greater voice.

In order to break out of this dilemma, it may be necessary to imagine very different institutional settings -- perhaps by reflecting on relevant experiences made in other countries. For

example, the Western European approach to occupational health and safety differs from the American approach in a number of important aspects. Some of the characteristics of the European system, as discussed by Ashford[40], are particularly significant in this context:

- Standards are generally regarded as guidelines, and inspectors have considerable discretionary power.
- First-instance citations are infrequent; warning and improvement notices are the major enforcement mechanisms.
- However, inspectors have the power to issue prohibition notices forcing immediate discontinuance of dangerous activities.
- European inspectors seem to be more specialized and better trained, and to enjoy greater prestige, than their American counterparts, and physicians are very often part of the inspectorate system.
- Either works' councils or joint health and safety committees are usually mandated by law.
- It is generally accepted that health and safety is the joint responsibility of management and labor.
- Relative to the United States, a larger proportion of workers are organized; collective bargaining is often done at the federation rather than at the plant level.

This brief list of characteristics is sufficient to suggest a certain pattern or style of regulation. Few mandatory standards, but greater emphasis on guidelines and on the discretionary

power of the inspectors. Less rigorous enforcement policy, but more reliance on consultative regulation and on "inspection with participative overtones".(41) Less use of legal tools, but a greater role for collective bargaining as an instrument of safety and occupational health policy.

Such a model of "self-regulation" of hazards at the workplace by cooperative effort of management and employees has been most clearly articulated in the recommendations of a British committee on safety and health at work (the "Robens Committee") which reported in July of 1972. In the words of the committee:

> A principal theme of this report is the need for greater acceptance of shared responsibility and more reliance on self-inspection and self-regulation and less on state regulation. This calls for a greater degree of real participation in the process of decision-making at all levels.(42)

Despite initial opposition to the self-regulation philosophy of the Robens Report, which some people viewed as naive and others as advocating laissez-faire, the recommendations of the committee have provided the conceptual basis for the sweeping Health and Safety at Work Act of 1974 (HASAWA). A detailed discussion of the HASAWA lies outside the scope of this paper, but it should be pointed out that the viability of the philosophy embodied in the Act depends on the satisfaction of some key institutional conditions: a strong, respected, and well-trained inspectorate; an active presence of the unions at the plant level; employees who are sensitive to safety and health issues, and well informed of their rights of protection under the law; a responsible and cooperative management and strong penalties when needed.

The extent to which these conditions are in fact satisfied in different Western European countries, and the possibility of generalizing particular national experiences in the area of occupational health are significant topics for future research.

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