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The theory of institutional choice attempts to identify the conditions under which a particular set of institutional arrangements may arise, and how those arrangements change with changes in environmental and human factors. This paper is primarily concerned with the role played by cognitive factors in the development of regulatory policies and in current debates about regulatory reform. It is argued that given the uncertainty of the scientific basis of regulation and the idiosyncratic character of many regulatory problems neither market nor bureaucratic forms of control offer generally acceptable solutions. A mode of control relying more on self-regulation and professional advice is proposed as an institutional alternative deserving careful analysis.

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1. Old and New Forms of Regulation

As instruments of governance of the economy, regulatory policies occupy an intermediate position between traditional forms of public intervention (general laws, taxes, incentives, interest rates, etc.), and direct public provision of goods and services.[1] Within the general regulatory regime we can again distinguish between the by now classical forms of economic regulation ("price and entry" regulation) and newer forms of "social" regulation that have become increasingly important during the last two decades.

Traditional economic regulation tends to be confined to specific sectors of the economy and focuses on prices, quality of services, market and entry conditions, licenses and quotas. Typical justifications for this mode of regulation are the need to control monopoly power, "excessive" competition, economic rent and "excessive" profits, or to protect the public interest--as in the case of regulation of radio and television broadcasting in the United States. Among American regulatory agencies, the Civil Aeronautics Board, the Federal Trade Commission, the Antitrust Division of the Department of Justice, and the Securities and Exchange Commission are well known examples of early attempts by the government to control prices and services, to ensure the security of financial institutions, and to discourage fraudulent practices.

The new social regulation (exemplified by agencies like the Occupational Safety and Health Administration, the Environmental Protection Agency, the Nuclear Regulatory Commission, the Consumer Product Safety Commission, and the Office of Civil Rights) is concerned with such problems as spillover costs or externalities,

consumer ignorance, risk, and discrimination. Because these problems are so pervasive, social regulation extends to many more industries and affects many more consumers than the old kind of regulation. It also affects much more directly the conditions under which goods and services are produced, and the physical characteristics of outputs.

The two types of regulation differ historically and in their rates of growth. While most economic regulatory agencies were created in the decade 1930-1940, that is, at the peak of F.D. Roosevelt's New Deal (the only significant exceptions being the Interstate Commerce Commission, created in 1887, and the Federal Trade Commission, 1914), "social" regulatory agencies are creations of the decade 1965-1975 (the only important exception is the Food and Drug Administration established in 1931).

Between 1970 and 1975 the number of major economic regulatory agencies has increased by 25% (from 8 to 10); the number of major social regulatory agencies by 42% (from 12 to 17). Their respective expenditures (in millions of dollars) in the same period went from 166.1 to 427.6 (an increase of 157%) for the economic agencies, and from 1449.3 to 4251.4 (+193%) for the social agencies.

2. Changing Attitudes Toward Regulation

Despite the fact that many authors tend to emphasize the similarities between these two types of regulation,[2] the differences are equally or even more important. Economic and social regulation do not differ only in historical origins, growth rates, policy instruments, and domains of application; they also embody quite different regulatory philosophies.

The New Deal regulatory commissions enjoyed a considerable amount of administrative discretion, while the legislation creating the social regulatory agencies was inspired by a deep suspicion that they would abuse their discretionary authority. In an effort to reduce this risk, Congress not only assigned specific goals and time limits for their fulfillment (especially in the case of environmental regulation), but even prescribed the administrative and policy tools to be used. It is instructive to review how this change in attitudes came about.

Faith in the power of expertise as an instrument of governance--technical expertise which neither legislators or "lay" courts nor bureaucratic generalists presumably possess--has been the traditional source of legitimation for the administrative discretion granted to regulatory commissions. For writers of the New Deal like Merle Fainsod, regulatory commissions emerged and became instruments of governance for industry precisely because Congress and the courts proved unable to satisfy the "great functional imperative" of specialization. Such commissions "commended themselves because they offered the probability of achieving expertness in the treatment of special problems, relative freedom from the exigencies of party politics in their consideration, and expeditiousness in their disposition".[3] Among the important reasons for the establishment of the regulatory commissions, Cushman, writing in 1937, mentions the greater ease in recruiting experts for an independent agency than for executive departments.[4]

According to Landis, "the demand for expertness, for a continuity of concern, naturally leads to the creation of authorities limited in their sphere of action to the new tasks that government

may conclude to undertake". In fact, Landis suggests, the supply of regulation creates its own demand of expertise:

> With the rise of regulation, the need for expertness became dominant; for the art of regulating an industry requires knowledge of details of its operation, ability to shift requirements as the condition of the industry may dictate, the pursuit of energetic measures upon the appearance of an emergency, and the power through enforcement to realize conclusions as to policy.[5]

To be sure, the New Deal advocates of regulation knew that, as Fainsod put it, the expertness of the administration is not always above suspicion. But they rejected any suggestion that the quality of regulatory decisions could be improved by limiting administrative discretion. Issues of fact should be handled by experts, using whatever methods appear to be most appropriate; administrative findings of fact are to be regarded as final. Judicial review of the evidence used in reaching a decision would be a serious threat to "the very virtue of specialized knowledge which constitutes one of the chief justifications for the establishment of commissions".[6]

It did not take long, however, for the idealized picture of regulatory agencies as the very embodiment of Weberian Zweckrationalität, to be replaced by a growing discontent with the entire process. At first, the criticisms were of a technical character, focusing on the faulty logic of particular types of decisions. For example, economists pointed out that the practice of calculating the rate levels for regulated firms on the basis of historical or "sunk" costs violates the basic principle that "bygones are forever bygones" and should not affect current decisions. As George Stigler, one of the sharpest critics of the regulatory approach, caustically remarked, "historical costs have powerful sway over untutored minds. The Internal Revenue Service

insists that corporations' assests be so valued. The public utility commissions consider historical costs a relevant or even decisive item in setting rates".[7]

The methods used by the regulators in determining the "fair" rate of return on equity capital were similarly shown to be beset with practical and conceptual difficulties. For many other problems--from the determination of the rate structure to the allocation of joint costs among different services--only conventional or arbitrary solutions seemed to be available. Understandably, many economists reached the conclusion that the regulatory process lacks sound conceptual foundations.

The progressive erosion of the faith in the expertise of the regulators led to new, deeper questions. The key issue now became: How is the enormous power of regulators, who are appointed, not elected officials, to be controlled? The assumption that congressional statutes would control administrative discretion had proved to be ill-founded, since Congress had delegated regulatory authority in very broad terms. The courts, too, had been very hesitant in reviewing regulatory decisions and findings of fact. Finally, it had proved equally illusory "to look to regulators as "scientists", professionals, or technical experts, whose discretion would be held in check by the tenets of their discipline. It has become apparent that there is no scientific discipline of regulation..." [8]

In the 1950s another type of criticism made its appearance and soon gained widespread acceptance: the "capture" theory of regulation. The essence of this theory, as summarized by Stigler, is that "as a rule, regulation is acquired by the industry, and

is designed and operated primarily for its benefit".[9] But how does it happen that regulatory agencies are captured by the very interests they are supposed to regulate? Some authors (for example, Stigler) explained the phenomenon in terms of the nature of the (democratic) political process and of a "rational" (i.e., utility-maximizing) theory of political and bureaucratic behavior.

Marvin Bernstein suggested that vague statutory language was the (or at least, a) cause of the capture of regulatory agencies by the regulated industries.[10] According to his theory of the "life cycle" of administrative agencies, once the political support that led to the establishment of a new agency begins to fade, vague legislative directions give the regulated industries the possibility of controlling the law's interpretation and implementation. As the initial enthusiasm is replaced by routine bureaucratic behavior, the regulators tend to succumb to the various incentives and bribes which industry can offer them in exchange for a lax application of the law. The remedy suggested by Bernstein and other scholars was to reduce administrative discretion by means of legislation which clearly stated agency goals and precisely described the instruments that were to be used to reach those goals.

The legislation of the 1960s and 1970s, establishing a number of new organizations in the field of social regulation, can only be understood against this background of criticisms and proposals to restrict the discretion of regulatory agencies.

3. Tasks and Instruments of Social Regulation

Good examples of the new "tough" attitude of Congress are the 1970 Clean Air Act Amendments, the Occupational Safety and Health

Act of the same year, and the 1972 Federal Water Pollution Control Act. These and other significant legislative enactments of the 1970s (like the Toxic Substances Control Act of 1976) represent major shifts from previous models based on decentralized regulation and voluntary compliance, toward regulation at the national level by means of legally enforceable standards.

Thus, the first federal law on air pollution control, enacted in 1955, 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 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.

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 implementating the law's requirements--requirements that had not been specific enough. Consequently, the Clean Air Act of 1970 assigned to the newly-

established Environmental Protection Agency (EPA) the goal of achieving "healthy" air by 1975. The tasks which EPA had to perform in order to achieve this goal were specified in great detail in the law[11]:

1. Thirty days after the passage of the act, propose national ambient air quality standards to protect public health and welfare.
2. Approve state implementation plans that prescribed specific emission limitations for different types of polluters within a year after the proposal of the air quality standards.
3. Set emission levels for new and modified stationary sources of pollution, for pollutants considered to be toxic by EPA, and for motor vehicles.
4. If the states fail to develop their implementation plans, the agency should take over.

To make sure that EPA would not evade these requirements, the act provided the possibility of citizen enforcement; i.e., citizens could sue EPA for not performing non-discretionary duties. Moreover, 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 admitted 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 abatements of any pollution proved..." Under the 1970 Amendments, however, health considerations would be the 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 requirement that acceptable implementation plans be submitted to EPA.

Legislative and administrative developments in the area of water pollution control follow a rather similar pattern. Before 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 imbalances 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 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.

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 new Water Pollution Control Act. Again, EPA's goals and technical means were precisely defined. Within one year after the act was passed, the agency was to promulgate effluent guidelines that designated allowable discharges for various industrial categories. Within two years after the act was passed, permits would be issued to individual manufacturers that would achieve the goals of "Best Practicable Technology" and "Best Available Technology" within the allowed

time limits. And, as in the case of the Clean Air Act Amendments, effluent and ambient standards for water were to be set on the basis of health considerations only.

Congressional action leading to the Occupational Safety and Health Act was also a response to widespread criticism of state regulation in this area. Lack of sufficiently trained personnel and of research facilities, bureaucratic inefficiency, "capture" by business interests, and weak enforcement, were the most frequently mentioned failures of state regulation. "Mandatory 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".[12]

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 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. By comparison with the precise tasks assigned to EPA, the Occupational Safety and Health Act may appear to give OSHA considerable discretion. In fact, OSHA's goal is stated in very general terms: "to assure as far as possible every working man and woman in the Nation safe and healthful working conditions".

Yet, the discretion of the agency, and of state implementation agencies, is severely restricted in a number of ways. First,

the law specifies the administrative instruments to be used. These are primarily safety and health standards, having the force of law, rather than, for instance, a use-permit system which OSHA has no legal authority to require. The law prescribes in great detail the procedure to be followed in establishing the standards. Also, Section 8 of the act has been generally interpreted as legally precluding OSHA inspectors from providing any consultation visits on an employer's premises (any entering upon the employer's premises is regarded as a formal inspection). Finally, any state that desires to assume responsibility for developing and enforcing its own occupational safety and health standards, must satisfy the stringent conditions listed in great detail in Section 18(c) of the act. State agencies are required to supply any information required by OSHA while the Secretary of Labor must make a continuing evaluation of state plans, retaining the right to withdraw approval for cause.

4. Regulatory Dilemmas

The fear of "capture" of the regulatory agencies by the regulated industries, and the desire to obtain quick and tangible results in pollution control and in occupational health and safety, have induced Congress to enact legislation severely restricting administrative discretion. It would be unfair to suggest that nothing has been accomplished by this method; and there is little evidence that the social regulatory agencies have surrendered to the pressure of powerful economic interests.

On balance, however, the results of such "agency forcing"[13] legislation must be judged negatively. The cost of achieving some measure of improvement in the quality of the ambient and working

environment has been, by all available estimates, staggering. Also, regulatory decisions reveal a consistent bias in favor of design standards rather than the more flexible performance standards. Finally, the number of such decisions has been almost negligible by comparison with actual needs.

In its first ten years of existence, for example, OSHA has promulgated only ten new occupational 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, cotton dust, benzene, acrylonitrile, and DBCP). The benzene standard was immediately invalidated by the Court of Appeals of the 5th Circuit, on the ground 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".

In the case of the vinyl chloride (VC) standard, industry opposed the proposed level of 1 part per million (ppm) on the grounds that OSHA lacked sufficient scientific 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. In order to overcome industry's resistence, OSHA finally promulgated a somewhat weakened permanent standard. These two brief examples should be sufficient to indicate the problems a regulatory agency faces in setting numerically precise and legally binding standards without an adequate scientific basis or clear knowledge of the benefits and costs of its decisions.

Toward the end of the 1970's, the attitude of Congress and of political executives had started to change once more. The new Clean Air Amendments of 1977 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".[14] 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 and the other regulatory agencies were exposed to strong pressures, coming from such bodies as the Council of Economic Advisers, the Council on Wage and Price Stability, and even from the courts, to reduce the costs of proposed health, safety, and environmental regulations. The difficulties of setting compulsory standards with less than adequate information were also becoming increasingly clear. A large number of existing standards were challenged by industry spokesmen and by independent researchers alleging that the scientific evidence was inconclusive. The understandable response of the regulators has been increasing risk aversion, causing a general slowdown of regulatory activities.

These contradictory developments reflect serious ambiguities in the underlying regulatory philosphy. Thus, in some cases the law requires the regulators to set standards on the basis of health or environmental criteria only. In other cases some balancing of

costs and benefits is called for, but no guidelines for doing this are provided and the statutory language is unclear. For the Occupational Safety and Health Act, for example, the courts had to determine whether section 6 (b) (5) of the act, which speaks only of "feasibility", allows the regulators to consider economic as well as technological factors in setting standards for toxic substances.

Because of the ambiguities, regulators are faced with almost insoluble dilemmas. If they base their decisions on scientific criteria only, they are accused of imposing excessive costs on the economy. On the other hand, if they attempt to balance benefits against costs, they run the risk of adopting standards that merely codify existing economic and technical conditions--to the detriment of their normative character. One can, in fact, argue that one of the main goals of environmental and health standards is to channel growth away from hazardous industries and materials toward safer forms of production and employment. But it is hard to see how a "feasible" standard (in the sense in which this term has been recently used) can provide the necessary signals.

Let us now assume that the law requires the regulator to base his decision (for instance, establishing a "virtually safe" dose for a toxic substance) on scientific criteria only. The actual process of standard setting involves a number of very delicate and subjective decisions. The technical core of all toxicological procedures used in standard setting is a dose-response model establishing a relationship between different doses of the toxic substance and the probability of response of the human organism. A curve is fitted to the observations in the observable range (fairly

high dose levels and corresponding responses) and then extrapolated downward to determine the virtually safe dose.

There are three major problems with this procedure. First, the choice of the extrapolating function can have a major effect on the value of the virtually safe dose--up to 100,000 fold differences according to the Advisory Committee on Safety Evaluation of the U.S. Food and Drug Administration. Second, the different extrapolating functions often cannot be distinguished from each other in the range of the observable responses. Finally, no firm scientific basis now exists for choosing among the different possibilities. As an experienced scientist has written, "All present safety evaluation procedures... must be regarded as mathematical formalisms whose correspondence with the realities of low-dose effect is, and may long remain, largely conjectural".[15]

It may be argued that if there is no firm scientific basis for choosing among the different mathematical models, then one should prefer the safest or most conservative procedure. One problem with this argument is that it is not clear where one should stop: it is difficult to be conservative in a consistent manner, unless one is prepared to propose a zero level of exposure in each case, i.e. to ban the use of the substance. Thus the regulator is faced with another dilemma. As a decision rule, conservatism in the face of risk is an unsatisfactory as the minimax or the "most likely event" principles, or indeed any principle that does not balance expected risks against expected benefits. On the other hand, the only consistent (Bayesian) decision

procedure requires information--prior probabilities of all possible scientific hypotheses, utilities for all possible consequences--which no regulator is likely to supply.

Political leaders are also confronted with a serious dilemma. Lawmakers, particularly in the United States, are very reluctant to place discretion in the hands of public servants. The entire regulatory structure is set up to protect the rights of the regulated from arbitrary shifts in position on the part of the administrators. However, environmental and health standards should be continuously revised as scientific knowledge improves, empirical evidence accumulates, and socioeconomic conditions and public perceptions change. The more uncertain the scientific basis of regulation and the greater the need for flexibility and adaptability, the more discretion should be left to the regulatory agencies. But present statutory regulations set narrow limits to administrative discretion.

Finally, consider the predicament of environmentalists, labor unions, and other "public interest" coalitions. These groups have played a key role in the development of social regulation. Largely because of their efforts, major responsibility for health and environmental issues has been moved from the local and state level to the national level, and from semi-public professional associations (such as the American Conference of Governmental Industrial Hygienists) to federal agencies. Instead of "consensus standards" accepted by industry on a voluntary basis, we now have legally enforceable national standards. But these shifts in the distribution of power, resources, and statutory authority have not produced the results anticipated by the advocates of an expanded federal role in social regulation.[16] Federal agencies have been forced to assume a greater share of the political and financial

costs of implementation than was originally envisioned. Federal standards, though legally enforceable, have been few in number and weakened by "feasibility" requirements and lack of adequate scientific support. Despite initial hopes of great methodological progress in standard-setting--a hope based on the superior financial and scientific resources of the federal government--the derivation of standards still remains an art rather than a science. In fact, since regulatory agencies rely on informal procedures in combining scientific evidence with economic and other considerations, the logic of the standard-setting process has become, if anything, even more opaque.

5. Regulatory Reform

As the preceding discussion indicates, social regulation in the United States today represents a negative-sum game in which the expected losses of all the players greatly exceed their expected gains. What is needed is a fundamental restructuring of procedures, institutions, and philosophies along lines that explicitly recognize the uncertainty and complexity of regulatory decisions.

Recent proposals of regulatory reform may be roughly classified under two headings: fine tuning and retooling. Examples of fine tuning are President Ford's and President Carter's requirements that major decisions be justified by "inflation impact statements" or "economic impact statements", estimating the economy-wide consequences of new rules. However, it has been argued that "most of the statements were probably done as part of the justification process after decisions had been made, rather than as part of the

preparatory work for making decisions on whether to invoke new regulations".[17] Moreover, given the state-of-the-art in cost-benefit and risk-benefit analysis, and the difficulty of estimating environmental and health benefits, the demand for conclusive scientific evidence and thorough economic analyses before a standard is adopted is more likely to delay public action than to improve the quality of decision-making and to generate dissension rather than consensus.

By retooling I mean the proposed replacement of the cumbersome system of standards, licenses, and prohibitions by effluent charges, pollution rights, and injury taxes. Greater reliance on market incentives would certainly increase the flexibility and efficiency of social regulation. Serious technical and political problems remain to be solved, however. Consider, for example, the use of effluent charges to reduce the negative effects of a certain pollutant. If the damage caused by different concentrations of the pollutant were known, the authorities could simply establish a charge or price equal to the marginal damage for each unit of residuals. Polluters would then decrease their residual flows, as long as the marginal costs of doing so were less than the price for discharging, settling at the optimum where marginal treatment costs equaled the charge. But usually the damage function is unknown and one must revert to (more or less arbitrarily determined) environmental quality standards. Also, for any given level of effluent charges, the resulting reduction in pollution is achieved at the least cost, but there is no guarantee that the charges will be sufficient to achieve the desired level of environmental quality (conversely, given a certain

environmental objective and appropriate enforcement procedures, effluent standards can always be calculated so as to satisfy the objective; but there is no way of knowing whether the objective will be met in an economically efficient way). Finally, market solutions are difficult to implement in certain important cases where health damages (caused, for example, by carcinogenic agents) can be detected only after many years.

The seriousness of the political problems of reform is indicated by the fact that, although economists have shown again and again that effluent charges are superior to other instruments of environmental policy in terms of effectiveness and efficiency, environmental legislation continues to rely on administrative controls. Similarly unpopular are proposals to introduce "injury taxes", or to raise insurance charges to cover the real costs of industrial accident and give firms a real incentive to improve their health and safety performance. One may argue about the reasons for the widespread resistance to the use of market incentives (incidentally, this resistance can be reasonably explained by a model of institutional choice which includes the interests and institution-changing strategies of the regulated),[18] but it is a fact that political constraints exist and set narrow limits to regulatory reform.

The major deficiency of attempts at retooling or fine tuning present policies is that they do not pay sufficient attention to the cognitive complexity of the regulator's tasks. Consider, for example, the problem of nuclear safety. The risk of a major nuclear accident is quite low, but its consequences can be very large indeed. Hence, an objective calculation of risks is extremely

difficult, and each risk problem represents essentially a unique situation. Under these conditions bureaucratic regulation may be expected to fail. Bureaucracy relies on fixed rules applicable to repetitive and standardized situations, and hence, it can be effective only when the number of exceptions is small and when there is a stable basis of knowledge from which solutions may be derived in more or less automatic fashion. But also market solutions are difficult to implement when risks are effectively incalculable and damage functions practically unbounded.

A possible resolution of this antinomy can only be sketched here. It consists in replacing as much as possible statutory regulations by nonstatutory codes and standards. This implies, among other things, a novel style of consultative regulations with strong participative overtones, and reliance on professionalism rather than hierarchy as the organizing principle of regulatory agencies.

The practical meaning of this suggestion may be illustrated by reference to the field of occupational health and safety. The main task of a professionally organized health and safety inspectorate would not be, as it is at present, that of ensuring compliance with minimum legal requirements. Rather, inspectors would be concerned with the broad aspects of safety and health at the workplaces they visit, as much as with those narrow aspects which may have been the subject of detailed regulation. The provision of skilled and impartial advice and assistance would become one of their most important functions. Rigid and uniform legal rules could then be replaced by standards and behavioral norms developed by industry itself (jointly by workers and management), and by

independent research institutions and professional organizations. Thus, a professional model of regulation would rely less on laws and more on voluntary self-regulation at the industry and plant level. In this system the inspectors would enjoy a considerable degree of autonomy, and the internal organization of the regulatory agency would use a minimum of hierarchical control, relying instead on intense consultation and peer review. Incidentally, somewhat similar proposals have been made in 1972 by the British Committee on Safety and Health at Work (Robens Committee), and have found wide acceptance in the Health and Safety at Work Act of 1976.

It may be objected that the model of social regulation proposed here is simply a return to the discredited ideology of expertise. My reply is that the assumptions are quite different. The professional model does not presuppose the existence of a firm body of standardized knowledge from which regulators could derive ready-made solutions. On the contrary, codes of professional behavior have been developed to deal with situations where the provider of a service must rely, to a greater or lesser extent, on idiosyncratic information and "tacit" knowledge. When knowledge becomes standardized (as in the case of much engineering and some medical knowledge), professional rules can be replaced by bureaucratic or managerial forms of control.

But what about the issue of administrative discretion and political legitimation? Would the professional model give excessive power to the regulators? The answer to these questions is implicit in the preceding discussion. The proposed model of regulation shifts the emphasis from legal enforcement to the provision

of information and high quality advice. In turn, this presupposes greater reliance on self-regulation and public participation in the regulatory process.

In the case of occupational health and safety, major responsibility for developing locally adequate rules would rest with management and employees (or their representatives). In other fields, such as the environment, various interest groups should be provided with relevant information, and given the possibility of challenging in the courts or at public inquiries proposals with adverse environmental effects, or to comment on draft laws and regulations to protect the environment (to some extent, this is already taking place in some countries, particularly in the case of applications for planning permissions).

Of course, the case for more professionalism and less bureaucracy has been barely outlined. Much detailed work remains to be done, but I am convinced that the institutional-choice approach will be as fruitful here as it has been in the study of markets and hierarchies.

NOTES

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18. Majone, G., "Standard Setting and the Theory of Institutional Choice", Policy and Politics, Vol. 4, No. 3, 1976, pp. 35-49; and "Choice Among Policy Instruments for Pollution Control", Policy Analysis, Vol. 2, No. 4, 1976, pp. 589-613.