

Limiting Democracy: Technocrats and the Liberal State

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As science and technology have increased in importance in all spheres of social life, so debates about their proper control have gradually moved closer to the center of the political stage. One recent topic in these debates has been the type of federal regulation that should be imposed on technological developments to minimize their harmful side effects, in particular, damage to the natural environment and to the health of workers and communities. Perhaps inevitably, the last few years have witnessed a growing backlash against what is characterized as excessive government regulation in such fields, especially where compliance has proved economically costly to the private sector. And "regulatory reform" has consequently been demanded as a necessary exercise in social efficiency, leading in particular to new ways of limiting environmental pollutants or occupational hazards that are compatible with the pursuit of profitability by the private sector.

Yet more than the question of efficiency is involved. The social regulation resulting from legislation passed by Congress in the late 1960s and early 1970s was an attempt to allow democratically sanctioned goals (and thus more democratic planning procedures) to be imposed on an economic system that would otherwise tend to dismiss many such goals as irrelevant to the purpose of making money. The potential for shifting control of technology away from the corporate sector soon became clear. From this perspective, the current regulatory reform movement is not merely an attempt to ease the economic burden of regulation; nor just a tactic to reestablish the hegemony of the economic over the social (e.g., "economic productivity" concerns over "quality of life" concerns). Rather, attempts to "rationalize" the regulatory apparatus must be seen as part of a broader political strategy aimed at limiting public participation in decisions about how the control of technology should be exercised.

And there is a growing divergence between the more authoritarian forms of political control considered necessary to reestablish a rapid rate of technological innovation and attempts to ensure that economic activities are tailored to socially determined goals.

The issues are therefore broader than regulatory reform, and the debates around them invoke basic political differences on questions about the public control of technology in general. If, for example, the traditional institutions of the liberal state are becoming outmoded, what are the implications for the limits of liberal reform—and can we design adequate institutions to put in their place? To focus on regulatory reform provides insights into the dynamics of the larger picture. Furthermore, while the principles involved may sound abstract, the concerns they raise are grounded in reality. Recently, for example, officials of the Department of Labor's Occupational Safety and Health Administration (OSHA) complained that pressures to analyze the economic impact of new health regulations—one of the demands placed on them by "regulatory reformers"—has resulted in extending from three to six years the time that it takes for a new regulation to be developed and put into effect. And the Union of Concerned Scientists has filed suit against the Nuclear Regulatory Commission (NRC), complaining about new licensing procedures proposed by the NRC that allow nuclear companies to protest if they consider new safety requirements to be too stringent—but prevent the intervention by critics who might consider them inadequate. In such ways, efforts to reduce the burden of regulation inevitably have political repercussions in affecting the balance of power between rival political institutions.

Early in 1980 Dr. John Kemeny, chairman of the presidential commission set up to investigate the Three Mile Island (TMI) nuclear accident, suggested after reviewing the failures of the NRC that "Jeffersonian democracy cannot work in the year 1980—the world has become too complex."¹ It is a challenging proposition. For the dilemma facing nuclear power—or more correctly, facing those responsible for the public acceptance of nuclear power—is symptomatic of a wider crisis being experienced by the traditional political institutions of liberal democracy. The main function of these institutions has been to balance different political interests in a way that provides a stable environment for the growth and dissemination of technology as a tool for generating wealth and, ultimately, power. So far, these institutions have been barely adequate to contain the potentially destabilizing side effects of technological growth, from the tensions caused by unequal distribution of the wealth, to complaints about technology's impact on the social and natural environment. In Europe, this has been achieved by various forms of welfare statism; in the United States, by

¹ Quoted in "Saving American Democracy: The Lessons of Three Mile Island," *Technology Review*, vol. 83, No. 7 (June/July 1980).

burgeoning government regulations. Yet two factors are now straining these institutions to their limits. The first is the increasing complexity, not merely of technology itself, but of the ways in which it interacts with society—what might be called its second-order effects. To this has been added the political tensions caused by a global slowing down of economic growth, and by endemic inflation in the economies of most Western countries, where policies aimed primarily at economic recovery and structural adaptation are shifting attention back to ways of stimulating technological change, rather than dealing with its side effects.

The result is a growing conflict between those who promote a rapid growth of technology, on the one hand, and those who seek its democratic control, on the other. It raises the uncomfortable question of whether, given political institutions in their present form, these two purposes may not prove incompatible. In other words, we may be discovering that the most significant limits that technological growth places on capitalist society are not, as the Club of Rome might have us believe, energy and resource constraints; nor are they limits to social expectations. Rather, they are the limits that technological change, geared in its present form, places on the effectiveness of the democratic process. For much of the twentieth century, technology and the liberal state have appeared the perfect couple; today they seem candidates for divorce.

There is little new in the observation that technology, Janus-like, offers both promises and threats. Or that, for most industrialized countries at least, the former have tended to outweigh the latter. But the lessons of the late 1970s are enough to give cause for concern. For each of the many threats that have been successfully dealt with (DDT, chlorofluorocarbons, recombinant DNA), there are as many that remain serious problems (toxic dumps, carbon dioxide, nuclear proliferation). Furthermore, the institutions formally responsible for dealing with these problems are finding it increasingly difficult to know how to respond. We find Congress pushed into decisions its members do not fully understand; courts asked to make decisions for which they are not technically—and sometimes not even constitutionally—equipped; and the regulatory agencies responding schizophrenically to a spectrum of legislative and political pressures.

In the past, the system was simpler, and it was sufficiently flexible to permit a certain vagueness and even ambiguity. The Founding Fathers seemed consciously to prefer a little waste in government to an efficient tyranny. Such commitments to participatory democracy, however, are wavering. We find John Kemeny, in an address at MIT, uttering a growing orthodoxy when he tells his audience:

I've heard many times that although democracy is an imperfect system, we somehow always muddle through. The message I want to give you, after long and hard reflection, is that I'm very much afraid it

is no longer possible to muddle through. The issues we deal with do not lend themselves to that kind of treatment.²

Increasingly, the state is taking on the role of an efficient manager, responsive to the demands of its corporate backers, eager to maintain discipline and productivity among its work force. There are more than echoes here of the nineteenth-century engineer Frederick Taylor, father of "scientific management," which raised productivity (and profits) by removing control over the labor process from the worker, and from his or her immediate foreman, and concentrating it in the hands of a corporate class, yet disguised this change of control by integrating it into the way that the work was defined and performed. One hundred years later, we find federal agencies involved in a comparable attempt to promote economic efficiency by limiting political participation in decisions that will determine the shape and direction of technological change.

That the bureaucracy has been able to do this—even in the face of the fact that such participation is both possible and necessary—is partly the result of uncertainties over both the causes and effects of technological change. Society is not a machine, and does not react mechanically to stimuli; given this unpredictability, choices must inevitably be made. As Jerome Wiesner, the immediate past president of MIT, has put it: "In a new and very complicated technology like nuclear power, you have to make assumptions that are not testable, and you can have a wide range of conclusions."³ Joseph M. Hendrie, then chairman of the NRC, put it more graphically when, in the middle of trying to cope with the confusion of the TMI accident, he incautiously admitted, "We are operating . . . like a couple of blind men staggering around making decisions."⁴ With no obviously correct answer, regulatory decisions are made for political rather than technical reasons—a simple statement, but one with many complex ramifications.

What has since become known as "social regulation" first came into prominence in the mid-1960s. Until then, the main regulatory role of the federal government had been to establish the ground rules for competition in industries such as railroads or telecommunications. However, the public outcry that followed a series of widely publicized developments, such as the unanticipated effects of DDT and thalidomide, spurred Congress to pass several pieces of wide-ranging legislation within a few years. The Environmental Protection Agency (EPA), bringing governmental environmental responsibilities under a central roof, was created by the National Environmental Protection Act of 1970, a year after President Nixon had set up the Council on Environmental

² Ibid.

³ Quoted in "Credibility Gap," *Newsweek*, April 23, 1979, p. 86.

⁴ Quoted in "A New Distrust of the Experts," *Time*, May 14, 1979, p. 54.

Quality (CEQ). The same year saw sweeping amendments added to the Clean Air Act, and the establishment of OSHA. This was followed, in 1972, by the setting up of the Consumer Products Safety Commission (CPSC). Twenty of the nation's fifty-five major regulatory agencies were established during the 1970s; and the budgets of the eighteen major social regulatory agencies—largely concerned with mitigating the side effects of technological change—grew from \$1.4 billion at the beginning of the decade to \$7.6 billion in 1979, an average annual growth rate of 20 percent.

At first the private sector generally acquiesced in the new regulations. A few complained that they were unnecessary, that the environmental and health complaints had been blown out of proportion, or that technology's side effects were a small price to pay for economic affluence. To others, however, society's new concern for the safety and health of its members appeared to be a sign of maturity. "As private consumption grows, because of the interaction among parts of the economic system, it is probably necessary that the social infrastructure grow even more rapidly, in order to maintain the quality of life and to vent dislocations in the economy," said a 1971 report from the Organization for Economic Cooperation and Development (OECD). The report added that research and development in the public sector might therefore become more important than that of industry. Others realized that, unless brought under suitable control, undirected technological growth could also spawn politically threatening social movements (particularly after the student revolts of 1968). A report written by three members of the Trilateral Commission in 1975 emphasized that since social and political resistance to industrial change had become strong, it was necessary to devise policies to facilitate necessary structural changes in advanced economies "at a socially acceptable pace."⁵

It took a few years before the full potential significance of the new environmental and safety legislation was realized—and to some it came as a shock. In several instances, it was not until the courts started interpreting the statutes that the implications of congressional policy directions started to register. One such ruling resulted from a case brought by the conservationist Sierra Club against the EPA, in which the Supreme Court held that under the Clean Air Act, the agency had a responsibility not only to cut back on existing sources of pollution, but also to prevent a "significant deterioration of air quality" in areas that were relatively unpolluted. In another case, the EPA was forced by the Environmental Defense Fund to introduce strict standards on lead emissions, after the agen-

⁵ Michael J. Crozier, Samuel P. Huntington, Joji Watanuki, *The Crisis of Democracy*, (New York: New York University Press, 1975).

seen, is to erode individual rights and to reduce the citizenry to an inert mass. The contradiction between formally democratic institutions and the reality of class power, exercised through psychological manipulation and surveillance, has become increasingly difficult to conceal. Official pronouncements encounter mounting disbelief; voters sink into "apathy"; and the decision makers themselves fall victim to their own lies, their endless manipulation of images, and lose the capacity to distinguish truth from falsehood, national interests from a "winning image."

The pretense that the sovereign consumer reigns supreme—that the public good represents the sum total of individual choices—makes it difficult to ask the citizen to make sacrifices on behalf of a larger cause, especially when most of the sacrifices usually end up falling on those who can least afford to bear them. Even appeals to patriotism, to manifest destiny, or to the mystical solidarity of the white race have become passé. Liberalism never developed an adequate idea of the common good in the first place, and this failure becomes critical in a period when mounting economic problems require decisive leadership and a sense of common goals. As Burnham points out, the "massive public controls" needed to deal with the energy crisis "cannot be maintained without consent in a democracy," and this consent will require in turn that "more than rhetorical effort to approximate equality of sacrifice will have to be made by policy elites."⁹ Unfortunately those policy elites, closely tied to the corporate hierarchy—often indistinguishable from it, in fact—can hardly be expected to equalize sacrifices of their own accord. Faced with a choice between democracy and open dictatorship, many of them will choose the latter. Already the rise of Ronald Reagan suggests the attraction of militarism disguised as a return to traditional values. Other signs of the times include the adoption of more or less openly elitist ideologies by the policy-making establishment, the fascination with Nazism in popular culture, the glorification of crime and crime prevention on television, and the current of sadomasochism that runs through so much contemporary pornography and has gained a certain respectability among free-swinging intellectuals.

Whether the West chooses democracy depends not on political and intellectual elites but on the people themselves. To be more precise, it depends on the revival and transformation of the Left. Why has the Left been so ineffective in opposing the rise of the corporate, therapeutic state? A full answer to this question lies beyond the scope of this essay. As a first step, however, it should be noted that one of the preconditions of the corporate state, as it began to solidify during the Progressive period, was the decisive defeat of Populism and the Knights of Labor, democratic movements of the late nineteenth century that advanced fundamental criticisms of industrial capitalism and radical proposals for

9 Ibid., p. 353.

cy had stalled under pressure from the oil industry. And the effects of this early legislation were reinforced when many of the public-interest lawyers, who had cut their professional teeth suing the government, were recruited by the Carter administration. In office they became known to industry as the "coercive utopians."

Much of the regulatory legislation is, indeed, broad-ranging, and potentially profound in its implications. The safety and health legislation, for example, required employers to provide a workplace "free from recognized hazards that are causing or are likely to cause death or serious physical harm to employees." Similarly, the Clean Air Act Amendments of 1970, which has been called an "unusually powerful and uncompromising piece of legislation," not only sets stringent air-pollution standards and a timetable for their implementation, but authorizes states to use broad planning instruments to insure that these goals are met. These include systematic land use and transportation controls, as well as the power to review the location of new sources of pollution, all of which are to be included in state plans for pollution control submitted for approval to the EPA. According to Richard Walker and Michael Storper, writing in the *Boston College Environmental Affairs Law Review*: "The Act is . . . a classic piece of single-purpose legislation, containing the (probably unanticipated) potential to generate far-reaching political and economic changes in American society."⁶

Such political changes may have been unanticipated by Congress when it passed the legislation. But they soon became obvious to private industry, which realized by the mid-1970s that the combined effect of many separate pieces of regulatory legislation had created a significant shift in the control of technological decision making from the private to the public sector. Their concern was expressed by raising the specter of creeping, or even galloping, socialism, as one public-relations expert has described it, with warnings that the private enterprise system was in danger of collapsing under the weight of government controls.⁷ Replying to a 1975 survey by the American Management Association, the president of one company said: "Corporations must resist actions and legislation that increase government controls on them. Frankly I don't see this happening and really believe that our country will become a socialized welfare state by the year 2000."⁸ Another voiced fears about allowing an excess of democracy: "Social responsibility can be integrated into the existing struc-

6 "Erosion of the Clean Air Act of 1970" *Boston College Environmental Affairs Law Review*, vol. 7, no. 2 (March 1979).

7 Quoted in John L. Paluszek, *Will the Corporation Survive?* (Reston, Va: Reston Publishing Co., 1977), p. 11.

8 *Ibid.*, p. 13.

ture, but if the 'tail wags the dog' it is unlikely that most businesses can survive."⁹

Economists took up the refrain. To them, the social regulation of technology's side effects through stringent legislation introduced an inefficient element into the proper functioning of the market economy. They stuck to the principle that, to the fullest extent possible, economic efficiency was best achieved by leaving choices to the "freedom" of the marketplace, rather than by delegating it to centralized political institutions. The government's role, it was argued, should be, wherever possible, to concentrate on creating a system of costs and prices sufficient to compensate for the impact of technology on "social goods" such as clean water and air, but to leave choices to private decision making. Charles L. Schultze, for example, then a senior fellow of the Brookings Institution, set this out explicitly in his 1976 Godkin lectures at Harvard University (later published as *The Public Use of Private Interest*). "Command-and-control" forms of legislation, he said, had little disruptive impact on centrally planned economies, in which the productive sector was already organized along these lines; but the problem of intervention was more difficult in a society that relied on private enterprise and market incentives, in which modifications to the flow of information or patterns of incentives might be more appropriate. "Our political system almost always chooses the command-and-control response and seldom tries the other alternatives, regardless of whether that mode of response fits the problem," he complained.

Not surprisingly, the recasting of environmental and safety regulations into a form compatible with the private decision making of the market became a central demand of the corporate sector on the government—and an early goal of the Carter administration when it came to power in 1977. Schultze was appointed chairman of the White House Council of Economic Advisers (CEA), which soon took a lead in promoting regulatory reform along these lines. In May 1977, for example, Schultze, along with Stuart Eizenstadt, head of the domestic policy staff, and Bert Lance, then director of the Office of Management and Budget (OMB), signed a memorandum to the President suggesting that "serious consideration should be given to totally eliminating most safety regulations and replacing them with some form of economic incentives (for example, an improved workmen's compensation program, or economic penalties tied to the injury rate)."¹⁰

Some agency heads have strongly resisted such pressure. Eula Bingham, for example, Assistant Secretary of Labor and head of OSHA, while successfully shifting the focus of her agency from safety to health issues, has consistently

⁹ Ibid., p. 16.

¹⁰ Quoted in Daniel Berman, *Death on the Job* (New York: Monthly Review Press, 1978), p. 27.

argued that her prime mandate is to protect the health of workers; and that the complexities of the decisions involved in improving the safety of the workplace, as well as the imbalance of negotiating power between employer and employee, make it unrealistic to expect the marketplace to produce rational choices on health and safety issues. Other agency heads have been more accommodating. The EPA, for example, under the guidance of its administrator Doug Costle, and with the full support of CEA, has recently introduced what is called a "bubble" system of air-pollution control. Under this system, firms can select their own strategies for meeting aggregate emission levels, perhaps decreasing pollution from one source in order to increase it from another, rather than having each source required to meet specified emission standards. In another experiment, states are allowing companies to buy and sell the "right" to pollute the air, on the ground that those who choose to continue polluting will be those prepared to shoulder the additional cost.

The net effect of these policies is an attempt to shift control of the consequences of technological change from the public back to the private sector. In advocating this shift, the CEA has had the active support and collaboration of two other agencies in the executive office of the President, namely the OMB and the Office of Science and Technology Policy (OSTP). The influence of both in shaping the federal government's role in regulation has been far greater than their names suggest. OMB is increasingly taking on the role of a strategic social-planning organ; on the one hand, responsible for the organizational efficiency of the government apparatus, on the other, emphasizing the government's role, in the words of OMB executive director Bowman Cutter, in creating an environment in which "investment decisions . . . can be made rationally."¹¹ Part of these efforts has been the attempt to mold environmental and health and safety regulations into the appropriately "rational" form, and OMB has put considerable time and effort into reorganizing regulatory responsibilities along these lines.

OSTP and its director, Dr. Frank Press, have been at OMB's elbow in its attempts to rationalize social policy. Under Dr. Press, the science adviser's office has formed close links with the budget agency. On the one hand, the latter has agreed to support more funds for basic research; on the other, OSTP has played loyal ally to the administration's social and economic policies. When the Office of Science Policy was first established in the 1950s, the major policy issues requiring a scientific input related to questions of technological strategy—for example, judging the effectiveness of particular lines of defense or space research—where the choices could relatively easily be reduced to a matter of tech-

¹¹ Don I. Phillips, Gail J. Breslow, Patricia S. Curlin, eds. *Federal R & D*, Colloquium Proceedings, A.A.A.S., June 19-20, 1979, p. 32.

nical judgment. In the 1970s, however, reflecting growing political concern about the second-order impacts of science and technology, the role of the science adviser was expanded to assist the White House in making decisions about how these impacts should be handled. Science has become politically important, not merely as a source of technological power, but as a tool to gather information about and to make judgments on the social impact of that technology—a tool whose use has become an integral part of the framing of social regulation.

OSTP has been influential in many of the recent controversies about the regulation of technology, from orchestrating the administration's response to the Kemeny Commission's report on the Three Mile Island accident (including playing an active role in selecting a new chairman of the Nuclear Regulatory Commission), to promoting strategies for dealing with occupational and environmental carcinogens. Distancing itself from those who admit to playing an "advocacy" role within the White House—such as the staff members of the Council on Environmental Quality—OSTP invokes the apparent neutrality of its scientific expertise to legitimate the policies that it proposes. But in philosophy and outlook it has remained committed to those in the White House who consider "excessive" regulation to be holding back industrial innovation, and hence economic growth. As Frank Press put it before the House Committee on Science and Technology: "Our approach is consistent with that of industrial leaders who ask the federal government for a climate that fosters innovation."¹²

CEA, OMB, and OSTP have been at the heart of the Carter Administration's efforts at regulatory reform (together with the Council on Wage and Price Stability)—and it is therefore important to understand how these three agencies, while explicitly seeking to improve the efficiency of government regulation, have in the process implicitly been involved in shifting the social control of technology back from the public to the private sector. The dominant ideology supported by these agencies is that, since regulation inevitably involves weighing the costs and the benefits of a particular line of action, the most efficient way of doing this is by using the marketplace as the manifestation of social choices. Indeed, in both its form and its content, regulatory reform is the reverse side of the innovation coin. And to the extent that federal policy under President Carter sought to stimulate innovation, not by direct means such as research and development investment, but by improving the operating climate for private decision makers, it is not surprising that the marketplace calculus increasingly became the matrix within which regulatory decisions have been evaluated.

¹² Quoted in David F. Noble, Nancy Pfund, "The Plastic Tower: Industry Goes Back to College," *The Nation*, September 20, 1980.

Three closely related trends have emerged from the regulatory reform movement. The first is a general pressure to quantify the risks and the benefits of a particular technology—from expensive medical equipment to car safety innovations—enabling a balance to be drawn between the two in an apparently nonpolitical way. Both Congress and the White House have, at the coaxing of industry, turned toward cost-benefit analysis as a decision-making tool, in order to challenge particularly restrictive regulations. An executive order from President Carter in 1978, for example, prompted by the CEA, required all agencies to carry out an economic analysis of the expected costs and benefits of any proposed regulation. The agencies were not required to demonstrate that the benefits outweighed the costs before introducing the regulation, since this would in some cases have required changes in their legislative mandate. But in several instances—for example, EPA's smog and lead air-quality standards, OSHA's cotton-dust regulations, or the Department of Interior's strip-mining standards—the figures produced by the agency provided a handle that government economists were able to use to persuade the agency to reduce the stringency of the regulations. Such moves led then Senator Edmund Muskie, a keen promoter of environmental legislation, to complain that “our standards of what is healthy are being compromised by economics.”¹³

The second important dimension of the regulatory reform movement has been the variety of attempts made to centralize regulatory decision making within the administration, in order to make it both more efficient and more accessible to political control. Dr. Press told a meeting of the American Association for the Advancement of Science in the summer of 1979 that “we have a regulatory structure which is highly segmented, wide-ranging and almost totally uncoordinated,” and that the almost total delegation of authority to an individual agency left “some control to the President, but little to the Congress, on individual regulations.”¹⁴ Numerous moves to centralize regulatory decision making have been made. Administratively, a Regulatory Council was established, responsible for increasing coordination and consistency between the regulatory agencies. OSTP actively promoted the National Toxicology Program, initiated by the Department of Health, Education and Welfare, but subsequently broadened into an interagency program to centralize decision information about toxic substances. Within the White House, responsibility for assessing the economic impacts of regulation was given to the Regulatory Analysis Review Group (RARG). More recently, OMB has been establishing a central coordinating mechanism for environmental health research. This followed, in particular, the politically embarrassing public differences between different agencies over the

¹³ Environmental Study Conference, *Factsheet*, April 26, 1979, p. 2.

¹⁴ Phillips et al., eds. *Federal R & D*, p. 18.

potential health hazards of the toxic waste dumps at Love Canal and elsewhere.

Finally, there have been various attempts to separate what are claimed to be the scientific from the political aspects of regulation. Each regulatory agency has traditionally been given a broad mandate to decide which problems it should tackle, based on certain criteria of what should or should not be considered a hazard. But there have been disagreements over how these criteria should be interpreted. Several agencies have chosen to regulate substances for which there is a suspicion of toxic or carcinogenic properties, but not enough data to claim scientific proof. Those agencies have claimed that often it would be irresponsible to wait for such proof, and that they have a responsibility to protect individuals against potential, as well as proven, threats. Industry, however, has challenged this approach, arguing that controls should be based on established scientific evidence, not merely on speculation (evidence that is, of course, much more difficult to provide). The American Industrial Health Council, for example, a lobby group set up by chemical companies and trade associations, has countered carcinogen standards introduced by OSHA—which requires controls following minimal evidence of carcinogenicity—by proposing a two-stage process. In the first stage, a scientific panel of experts—perhaps convened by the National Academy of Sciences—would adjudicate whether a substance is or is not a carcinogen; only then would a regulatory agency be responsible for devising appropriate controls. This strategy has been supported by a number of pro-industry groups, from the National Association of Manufacturers and the Chamber of Commerce to the Heritage Foundation. It has also been included in a number of pieces of proposed regulatory reform legislation. And, in less explicit form, it has been included in several recommendations by OSTP on how the role of science could be enhanced in the design of regulations.

Each of these managerial devices—an emphasis on cost-benefit analysis, the centralization of regulatory policies, and the dividing of the scientific from the political aspects of regulation—can be criticized on pragmatic grounds. Cost-benefit analysis, for example, inevitably requires an oversimplification of complex social phenomena, and the incorporation of highly subjective assessments (such as the value of a life, or of an unspoilt panoramic view) into a neatly quantified statistic. The centralization of regulation ignores the widely different legislative histories of the various regulatory agencies, as well as their responsibilities to different sectors of the community. And, in practice, separating the science from the administration of regulation has often—as with the Delaney clause¹⁵—proved artificial and unworkable. (A recent report from the Toxic Substances Control Program, largely written by environmentalist advocates within the

¹⁵ The Delaney Clause prevents the use in food of any chemical additive known to be capable of causing cancer in laboratory animals, regardless of dosage.

White House, said that it did not consider attempts to separate facts from values as realistic, "because of the inseparability of science and policy at every stage of decision making".¹⁶⁾

Each of these management devices, however, can be, and frequently is, defended as a necessary element for managing a complex technological society, regardless of the extent to which it cuts across other political considerations. What is therefore open to criticism is not the *fact* that some type of management is necessary, but the way that it is being exercised: the *form* of these decisions has as much significance as their *content*. The three devices listed above share in common a tendency to force the complex, and often contradictory, second-order effects of technology into a form that can be directly controlled from the center. As in Taylor's scientific management, individual regulatory tasks are designed according to a division of labor suited to hierarchical management control. The result is that aspects of regulation that do not fit neatly into this managerial mold—for example, greater shop-floor involvement in capital investment decisions or product design—are given less weight than those factors that contribute directly to the production and reproduction of capital.

One consequence of such a design is that we find, in many regulatory disputes, that much more is involved than merely a difference of scientific opinion or of technical strategy. Frequently, the clash is between conflicting approaches to the way that social regulation should be both conceived and executed, based on different political conceptions of how social control of technology should be exercised. We might label these, in their purest forms, the "democratic" and "technocratic" paradigms for regulatory action, in the sense that they represent mutually exclusive fields of discourse, and invest scientific and technical data with different types of significance.

The democratic paradigm sees the problem of the real and potential hazards created by technology from the point of view of the individual or social group exposed to the hazards. Given the choice, it errs on the side of caution rather than recklessness, of safety rather than profits. It does not require definitive or conclusive evidence of a hazard before taking preventive action. Perhaps most importantly, this approach gives political responsibility for choosing how to cope with the problem of risk to those most likely to have to bear the direct consequences.

The technocratic paradigm, in contrast, tries to make a "best estimate" of risk, and uses this to fine-tune the regulatory apparatus so that it presents the minimal economic burden to the corporate sector. It will argue that those who

16 "Final Report on Toxic Substances," CEQ, 1980, p. 34.

promote technology do bear a responsibility to protect individuals and groups from risk, but places such concerns within the broader calculus of the economic viability of the private sector—with warnings of the dire consequences if this viability is not maintained. It, too, will err, if possible, on the side of caution; but will be equally cautious of overestimating risks and thus creating what it considers unnecessary obstacles to profitability. It will listen to complaints from those who claim to have suffered from the consequences of corporate actions, but then use scientific experts to certify these claims before accepting that they have any significance. In the face of public surveys that continue to show widespread support for stringent environmental and health legislation, this approach will emphasize other surveys that, not surprisingly, show public opposition to “unnecessary” regulation. Finally, the technocratic paradigm seeks to return responsibility for controlling risks back to private-sector decision makers, in the belief that (ignoring the unbalanced distribution of economic power) marketplace decision making will ultimately prove to be the most efficient.

Conflict between the two paradigms is inevitable. Technocrats claim that the democratic paradigm is both unworkable and unnecessarily expensive. In public debate, they will argue that democratic policy decisions are based on emotion rather than objectivity. And by characterizing the democratic paradigm as a “command-and-control” approach, they imply that it is inherently undemocratic. Conversely, the technocratic paradigm is accused by democrats of skewing regulatory decision making away from the best interests of the community, to serve instead the interests of private capital. It is claimed that the attempt to limit the direct influence of political considerations on regulatory decisions, however much it may appear to improve management efficiency, has dangerously one-sided implications. Dorothy Nelkin of Cornell University warns that political conflict and ambiguity are “basic realities of technological decisions.”¹⁷ The technocratic paradigm tries to deny this basic reality, removing debates about risk as far as possible from the sphere of public decision making and at the same time circumscribing those limited aspects of the debate in which political involvement is considered legitimate. As Frank Press puts it: “Where the stakes are high, there is ample incentive for the parties involved to interpret the data in ways which suit their own purposes. We need to develop ways of fencing in these areas so that the debates on regulation can be confined to legitimate differences in value.”¹⁸

The so-called regulatory reform movement can be looked on as an attempt to shift the basis of regulation from the democratic paradigm, in which regulatory decisions are open to full public participation, to the technocratic para-

¹⁷ Dorothy Nelkin, *Technological Decisions and Democracy* (Beverly Hills: Sage Publications, 1978).

¹⁸ Phillips et al., eds., *Federal R & D*, pp. 21-22.

digm, which is more compatible with the political strategies of private corporations. The common theme running through supporters of "reform" is that regulation has become too democratic, allowing public opinion too much leverage over the private sector, and thus sapping its vitality. In the case of nuclear power, for example, one author compares the United States, where environmentalist challenges have successfully delayed a number of major nuclear projects, to Europe, where critics have less legal leverage on the licensing process, and greater control is retained by the state and the private sector. In contrast to Europe, the U.S. regulatory system is "inimical to nuclear power," writes Michael M. Golay of MIT. He quotes the views of U.S. utility managers that the current nuclear regulatory system is perceived as "capricious, irrational and unpredictable"; their conclusion, he says, is that this perceived unpredictability is substantially inhibiting the growth of nuclear power. Thus, according to Golay, from the point of view of the nuclear industry, the most fundamental problems of nuclear power regulation come from the design of the regulatory system, rather than the efficiency with which it is managed. And he suggests that the essential reform needed for the U.S. nuclear regulatory system, in line with the strategies described above, is the separation of political and technical issues.¹⁹

Part of the problem, however, is that the conflict between these two paradigms reaches down to the heart of the scientific process itself, to its attempts to establish a legitimate basis of "fact," upon which socially acceptable levels of environmental and health effects can be agreed. A typical conflict is that between epidemiologists, used to starting from health problems as they occur in real-world situations, and health physicists, whose methodology is more firmly rooted in laboratory-bench practices and criteria. One example of this conflict has been the recent disputes over the health effects of low levels of ionizing radiation. Many epidemiologists argue that, although a precise scientific explanation may not have been developed, there is sufficient empirical evidence and statistical ambiguity in human cancer data to support a highly conservative approach to such dangers. Health physicists, in contrast, lean more heavily on the results of laboratory animal tests, and existing knowledge of, for example, biological repair mechanisms, to argue that excessive caution may be unnecessary, and may indeed be damaging to the cause of nuclear power. It was such a difference in perspective, rather than disagreements between rival scientists from the same discipline, that was at the heart of the conflict in the recent report from the National Academy of Science on "The Biological Effects of Ionizing Radiation." In this instance, epidemiologists, prepared to argue the case in favor of stricter regulation, were outflanked by health physicists, who argued that current radia-

¹⁹ "How Prometheus Came to be Bound," *Technology Review*, vol. 83, no. 7 (June/July 1980).

tion standards are perfectly adequate—and may already be more stringent than necessary.

Another similar example has been the controversy over the potential hazards arising from research using recombinant DNA techniques to alter the genetic material of living organisms. The activities of the Recombinant DNA Advisory Committee, set up by the National Institutes of Health to oversee regulation of DNA research, have consistently polarized into scientists (and industrial promoters of the research), who want to see the research continue as fast as possible—and therefore to minimize the possible dangers—and the minority “public interest” representatives, seeking a more cautious approach and greater outside participation in the decision-making process. The difference came out most sharply in reports on risk-assessment experiments carried out in top-security laboratories in Fort Detrick, Maryland. Scientists used the outcome of the experiments to claim that recombinant DNA research had virtually been given a clean bill of health; public-interest critics, who pointed out that many aspects of the tests were either ambiguous or indicative of further unexplored hazards, were virtually ignored.

As the technocratic paradigm comes to dominate regulatory decision making in the name of management efficiency, it is important to understand some of the dangers that it entails. The first is that its use of cost-benefit analysis (or in its expanded form, risk-benefit analysis), while it can be defended on the logical ground that any social or individual action should be based on weighing the arguments for and against, inevitably locks social values into a mold whose features are determined by whether or not they are of interest to the corporate sector. Health damage is assessed in terms of lost earnings, environmental damage in terms of lost “amenity.” Furthermore, however much scientists may qualify their judgments about the dangers of a particular chemical substance, or of nuclear power, by emphasizing the uncertainties involved, their qualifications tend to get lost when an administrator plucks out the figures to support a particular decision. Often this is blamed on the public’s difficulties in coming to terms with complex phenomena: “The public’s desire for simple answers gets scientists into trouble,” says Dr. Russell Peterson, until recently director of the Office of Technology Assessment.²⁰ But the fault as often lies with administrators, who find a security in precise numbers that is lacking in more subjective assessments. A recent report on decision making in the Environmental Protection Agency, produced by a committee of the National Academy of Sciences, reported that the agency’s use of quantification was carried to “unwarranted extremes” in the

²⁰ Quoted in “Credibility Gap,” *Newsweek*, April 23, 1979, p. 86.

regulation of pesticides, and it recommended that the EPA abandon its attempts to produce numerical estimates of the impact of human health data because of the many uncertainties on which these were based, and to develop instead a system of relative carcinogenicity indicators. The overuse of cost-benefit analysis results in a language that, according to Christopher Lasch, "surrounds the claims of administrators and advertisers alike with an aura of scientific detachment."²¹

Even beyond its inherent limitation, the technocratic paradigm for regulation also has several broader political implications. One is that it restricts the potential effectiveness of the regulatory agencies by giving them broad mandates—and then defining narrowly the way these mandates are expected to be met. Thus, instead of being allowed to devise the most effective strategy for meeting its particular mandate, a regulatory agency will frequently find that its strategy has been predetermined; and even if this has not been explicitly done, its methodology remains vulnerable to outside pressure. In practice, those agencies prepared to mold their strategies—as the EPA, for example, has done in the case of the bubble concept—into a form compatible with corporate sector decision making found political support within the Carter administration. Those who pursued a different strategy, challenging industry's attempts to shape the structure of regulatory decisions, faced an uphill battle in getting their regulations accepted. As one biweekly newsletter commented, on efforts by OMB to reorganize health-effects research within the EPA: "It now faces the prospect of redirecting its resources . . . in ways that will be compatible with—let's face it—the political decision-makers."²²

Congress does not make the process any simpler by trying to retain control of regulatory strategy by specifying detailed goals and rigid means. In theory, this is supposed to protect against too much power being concentrated in the bureaucracy; in practice, the congressional mandates are often impractical or badly thought out, leading to inevitable confusion as problems become more complex. The effect of adding the Delaney clause, which forbids the use of food additives known to cause cancer in laboratory animals, to the Food and Drug Administration's charter, creates difficult policy choices when the level of carcinogenicity is low—as with saccharin—and there is no other evidence of harm. Within agencies, detailed mandates can stifle initiative and imagination; it becomes safer to play by the rules, for which one can seldom be faulted, than to rely on potentially vulnerable personal judgment. The result is a reading of the letter rather than the spirit of the law—and frequent myopia. John Kemeny expressed his astonishment that the NRC seemed to have missed "the really signifi-

²¹ Christopher Lasch, *The Culture of Narcissism* (New York: W.W. Norton, 1979), p. 77.

²² *Environmental Health Letter*, vol. 19, no. 14 (July 15, 1980), p. 2.

cant and fundamental issues of nuclear power," such as operator training.

The growing hegemony of the technocratic paradigm also reduces the potential impact of public participation in decision making over the control of technology. As early as 1971, the OECD report *Science, Growth and Society* had warned that the more groups participating in decisions, the more likely that their goals and values would come in conflict. "At the same time, the growing complexity of society demands greater harmonization among the many separate decisions that are made," the report said. "Thus participation and coherence often collide head-on, leading to paralysis of the decision-making process."²³ Five years later, a report to the Trilateral Commission on *The Crisis of Democracy* took up the same theme. One of the authors, Samuel Huntington, wrote that "The vitality of democracy in the 1960s (as manifested in increased political participation) produced problems for the governability of democracy in the 1970s (as manifested in the decreased public confidence in government)"!²⁴ And more recently, Dr. Jerome Wiesner of MIT (which has been actively engaged in helping private companies devise a response to the new demands for risk accountability that are being placed on them) claimed, in an interview with *U.S. News and World Report*, that the increase in public participation had lead to a paralysis of decision making; "What is needed is reestablishment of a governmental mechanism to end the paralysis."²⁵

Wiesner's analysis is that "we have created a society that is unmanageable because we no longer have established ground rules for decision making." In other words, those ground rules that we do have—those on which the traditional institutions of liberal democracy are based—are no longer adequate. In the battle for new ground rules, the dominant voice that is being heard is not that of democratic liberalism, but that of corporate planning. Cost-benefit analysis, the reinstatement of the rule of experts—even at the top levels of science policy—the separating out of public participation in technical decision making, these are all part of the new ground rules. Industry is busy writing them, arguing that they are necessary to reestablish profitability; universities are being recruited to provide legitimacy to "rationalizing" regulation. (Edward Kane of Dupont told a university meeting: "None of us is well served by inefficient and uneconomic regulations. . . . you in universities are in a good position to present that argument and point the policy-makers towards sensible decisions.")²⁶ The federal government is busy trying to put these new ground rules into practice.

23 OECD, *Science, Growth and Society* (Paris, 1971), p. 17.

24 Crozier et al., *The Crisis of Democracy*, p. 76.

25 *U.S. News and World Report*, August 11, 1980, p. 66.

26 "The Environment for R & D," *Chemical and Engineering News*, December 4, 1978, p. 3.

Ideologically, the whole package has been given a boost by the concept of "reindustrialization." Popular with both political parties during the 1980 presidential election campaign, "reindustrialization" has become an umbrella term used to describe the uniting of two sets of policies. The first set includes tax incentives, patent-law reforms, and similar means to stimulate technological innovation in the private sector through a reconcentration of wealth. The second involves a growing realization that, even in capital's own terms, the market place may be inadequate for the type of strategic planning required by advanced economies. As early as 1975, Henry Ford II spoke of the need for a federal planning body, "not because some wild radical demands it, but because businessmen will demand it to keep the system from sputtering to a halt."²⁷ Since then a growing number of business leaders have come to accept the necessary role of the state in helping to shape industrial policy.

Plans for "reindustrialization" envisage three-way cooperation between business, labor, and the federal government. However, it remains clear that business will be the major partner, and that both labor and the government are expected to cooperate with its demands. From labor's point of view, this means restraining wage demands, dropping any opposition to technological innovation, and responding more "flexibly" to the demands of capital; it also means accepting less rigid health and safety standards in cases where more stringent regulation might adversely affect corporate profitability. As the dean of one business school has warned: "If government is reluctant . . . to review unreasonable regulations, and if labor is unwilling to relax onerous work rules, then what has happened in steel will eventually occur in every basic industry."²⁸ *Business Week* warned, in a special issue on reindustrialization, that "Government must face up to the fact that the explosion of federal regulations placed on business to achieve goals—a cleaner environment, equal employment, and a safer workplace, for example—has diverted vast amounts of capital from production and research and development."²⁹

What message does this hold for the future? The shift from the democratic to the technocratic paradigm for controlling side-effects of technological change is likely to continue into the 1980s. The effect of the change will be to make it increasingly difficult for environmentalist and labor groups to achieve their social objectives by the same legislative means that they did in the 1970s. Single-issue politics may have reached its limitations as a political strat-

²⁷ Quoted in Thomas H. Naylor, "The U.S. Needs Social Planning," *Business Week*, December 17, 1979, p. 18.

²⁸ Quoted in *Business Week*, June 30, 1980, p. 75.

²⁹ *Ibid.*, p. 88.

egy; the new type of politics requires a new type of response. If the corporate sector seeks to pull control of technology's social impact back to its own turf, by persuading the state to regulate through market mechanisms and tax incentives rather than direct interference, then its critics need a similarly coherent response, merging the interests of environmentalists, labor, and minority groups into a broad-based political coalition and a new strategy to address the same issues.

Thomas Jefferson once wrote that "whenever the people are well informed they can be trusted with their own government." The dilemma faced by the modern state is that, although this axiom may remain a premise of democracy, in the field of technology and technical change it has become virtually impossible to achieve. Some delegation of authority is therefore necessary; but the complexities and uncertainties of our technological environment have made traditional political solutions even less appropriate than they may have been in the past. We have a choice of what to put in their place. We are being offered, in the spirit of what the president of a large drug company has called "the new age of reason," a system that allows profit motive and financial gain to control not only the future direction of technological development, but also the way that society deals with its side effects. What we need to work for, in contrast, is a way for control of technology and its side effects to be molded in the direct interests of those most affected. There is still hope, but time is running out.