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Problems in U. S. Standard-Setting: The Implications of the Shift to Control Functions

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Standard-setting, one of the traditional and more mundane tasks of government in the United States, has recently become the focus of considerable attention among both policymakers and analysts.¹ This increased attention reflects a number of developments in contemporary public policy, but has specifically derived from the federal government's² increasing reliance on standards as a means for protecting both the general public and certain groups from critical health and safety hazards.³

As one of several tools useful in accomplishing these ends, standards have not been the "ideal" regulatory mechanism; yet they have the potential to greatly improve on alternate means currently in use or being considered. For example, complete reliance on the unencumbered marketplace — a strategy underlying current calls for "deregulation" — has not proven fruitful as a means for halting or minimizing the emission of photochemical

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¹See, for example, William Lilley III and James C. Miller III, "The New 'Social Regulation'," 46 *The Public Interest* (Spring, 1977), pp. 49-61.

²Standard-setting is perhaps most common on the local level, especially in the areas of building, health, fire, and related "codes." These have been a characteristic feature of American municipalities from early colonial times. For example, see Carl Bridenbaugh, *Cities In The Wilderness: The First Century of Urban Life in America, 1625-1747* (New York: Alfred A. Knopf, 1955).

³For present purposes we will not distinguish between "environmental" and "safety" regulations; however, the distinction can prove analytically important. See Nina W. Cornell, Roger C. Noll, and Barry Weingast, "Safety Regulation," in Henry Owen and Charles L. Schultze (eds.), *Setting National Priorities: The Next Ten Years* (Washington, D.C.: The Brookings Institution, 1976), p. 457.

oxidants, sulfur dioxide, or carbon monoxide into the atmosphere. Nor has an increased flow of consumer information in certain product areas prevented product-related accidents and health hazards or substantially reduced safety risks of producing or consuming a poorly designed item.⁴ In addition, alternative forms of formal government intervention have proven ineffective in many instances. As Roger Noll has noted, the administrative process of regulatory commissions and similar agencies (with their historical aversion to general rule-making and their penchant for adjudicatory techniques)⁵ has shown itself to be a rather "blunt instrument."⁶

A concisely drawn and justly enforced set of standards seems an inviting choice among the many and varied means for enhancing the public health and safety. Yet, the potential value of standards as regulatory tools is severely constrained in current practice. Today's controversies surrounding the application of standards reflect a concern for the manner of their development as well as their enforcement. Much has been written and spoken about the latter problem. One need look only at the debate surrounding the Occupational Safety and Health Administration's brief history to realize that the enforcement of standards has been the topic of much heated discussion. In this paper we will focus on the matter of standard-setting and some of the fundamental problems which have plagued and continue to effect the development of enforceable standards. Our purpose is not to posit solutions, but rather to clarify the issues involved and their implications for the current debate.

Our theme is based on the assumption that the contemporary problem of standard-setting in the United States is the result of three interrelated circumstances. First, there has been a subtle yet significant shift in the role of standards in society and standard-setting as a major governmental function. Second, given this shift, there has been a complementary change in the attributes expected of standards developed and enforced by government. Third and perhaps most important, current standard-setting procedures and possible alternative approaches do not seem likely to produce standards which optimize those attributes. In each of the following sections we will consider the problem of standard-setting as manifested in each of those circumstances.

⁴The impact of "warnings" printed on cigarette packages is an example. The records of the FDA, FTC, Consumer Product Safety Commission, and similar agencies seem to speak against the effectiveness of overreliance on increased consumer information as an efficient regulatory method.

⁵See James Q. Wilson, "The Dead Hand of Regulation," 25 *The Public Interest* (Fall, 1971), pp. 39-58.

⁶Roger G. Noll, "Breaking Out of the Regulatory Dilemma: Alternatives to the Sterile Choice," 51 *Indiana Law Journal* (Spring, 1976), pp. 687-691.

The Changing Functions of Standards

Our understanding of the problems government is encountering in standard-setting begins with the fact that standards themselves are functionally diverse. They are, of course, requisite to much of human social interaction, especially in large, complex, and highly differentiated societies. In such contexts standards perform several key tasks, among which are three of extreme importance: comparison, integration, and control.

First, standards function as criteria for and examples of "correctness, perfection or some definite degree of any quality."⁷ Used in this way, standards facilitate the measurement and comparison of actions and products. Thus, as the size of the marketplace increases there is a greater need for *comparative standards* useful for both buyers and sellers. The establishment of U. S. Department of Agriculture grading systems for meat, poultry, eggs, dairy products, etc., is a relatively recent example developed in response to demands from both producers and consumers who face the new "supermarket" place. The buyer familiar with the grading systems realizes, for instance, that there is a qualitative difference between the "U.S.D.A. Choice" meat and other qualities of beef or lamb; between "U.S.D.A. Grade A" poultry and birds of lesser grades; between "U.S.D.A. Grade No. 1" produce and lower quality fruits and vegetables; and so on. Whether referring to tenderness, flavor, size, color, shape, or any other product attribute, these standards permit those who utilize them some leverage and choice which might not have been theirs previously. This becomes increasingly important in the large, impersonal mass market where the direct confrontation between producer and consumer has become minimized.

Standards also function as a common foundation upon which we build or link related activities. Units of time, for instance, act as divisions of day and night and allow us to structure and coordinate work. In this way, temporal standards have facilitated and integrated human actions for centuries. The clock, notes Lewis Mumford, "is not merely a means of keeping track of the hours, but of synchronizing the actions of men." Similarly, standards have proven useful in the allocation and distribution of space for work, play, ownership, etc.⁸ And just as the increase in market

⁷A perusal of the *Oxford English Dictionary's* definitions for "standard" will provide substantial reason for the diversity of function involved. This definition explicates one among many uses for the term.

⁸Mumford's critique of the role standards have played in the mechanization and militarization of modern social life is reflected in all his work since the 1930s. His classic expression of this theme is valuable for its general insights as well as its ideological pretentiousness. See *Technics and Civilization* (New York: Harcourt, Brace, and World, 1934/1963).

size has brought about the greater use of comparative standards, so it has necessitated increased reliance on these *integrating* or *coordinating standards*. The factory and other institutionalizations of mass production techniques have created situations where hundreds and even thousands of workers are asked to perform operations in sequences on an assembly line and interchangeably between shifts. In accomplishing these ends the use of standards has grown considerably.

Finally, standards function in society as a means for control. Through the establishment and application of minimal levels of quality certain social units are able to obtain given products or forms of behavior from subject or target populations. In this way, those at the top of a corporate hierarchy apply standards to regulate (as opposed to coordinate) the quality of production and products of those "on the line." Similarly, government agencies such as the Environmental Protection Agency issue standards concerning minimal emission levels for vehicles purchased in the U. S., and school faculties establish grade point averages below which a student cannot fall without facing academic probation or suspension. *Control standards* such as these are playing ever greater roles in today's mass market and mass production economy where the general public finds itself in constant need of protection from both the direct and indirect consequences (spillover effects) of technological innovation and economies of scale. Recent crises (e. g., environmental, energy) and related movements such as consumerism, have contributed to the proliferation of standards applied as a means for control.

It should be evident from this brief discussion that distinctions between standards based on these functional categories are rather vague. Standards do not necessarily fall into one functional category, and in fact may fulfill two or all three roles at various times. A given qualitative standard for meat or produce may inform the consumer of the comparative value of an item, but it may also simultaneously act as basis for coordinating the processing activities of food packaging and wholesaling operations. In addition it has the potential of being applied as a means of control if some party (e. g., a retailer or the government) wishes to do so. In short, a given standard can be used in a variety of ways. At first glance this flexibility of use seems a virtue. However, as we shall see later in this paper, it also has its drawbacks. To put the argument briefly, while a standard may prove useful in fulfilling functions other than those for which it was developed, it may not prove sufficient in meeting the demands of those who are seeking to apply the standard in a different way.

Underlying this position is the fact that standards, while capable of being applied in a variety of ways, are typically established with much

more specific intentions in mind. This is backed by evidence one finds in the history of governmental standard-setting in the United States. Until recently government standard-setting efforts have stressed comparative and integrative functions. This should not be surprising since a salient feature of American history has been the promotion of economic growth. Consider, for example, the history of federal involvement in this area.

The role of government in standard-setting is not new for the U. S. The authority for nation-wide standard-setting predates the Constitution. Article IX of the Articles of Confederation grants "the united states in congress assembled . . . the sole and exclusive right and power of . . . fixing the standards of weights and measures throughout the united states . . ." Transposed to Article I, Section 8 of the Constitution, this standard-setting authority was taken for granted as a necessary requisite for providing "for the harmony and proper intercourse among the states."⁹ Despite this obvious consensus at the time of the founding, little of substance was accomplished in standard-setting through the initial Administrations of government. In his agency-commissioned history of the National Bureau of Standards,¹⁰ Rexmond C. Cochrane takes note of some activities undertaken during Washingtons tenure in office, but these were little more than exercises in report writing. There was, for instance, a report by Secretary of State Thomas Jefferson discussing the need for standards to facilitate commerce.¹¹ Even more noteworthy was that portion of Alexander Hamilton's "Report on Manufactures" (1791) in which he expresses the need for the national government to involve itself in standardization activities. Thus, among his recommendations was the call for

Judicious regulations for the inspection of manufactured commodities. This is not among the least important of the *means by which the prosperity of manufactures may be promoted*. It is, indeed, in many cases one of the most essential. Contributing to prevent frauds upon consumers at home and exporters to foreign countries, to improve the quality and preserve the character of the national manufactures, it cannot fail to aid the expeditious and advantageous sale of them, and to serve as a guard against successful competition from other quarters . . .¹²

⁹Federalist No. 42.

¹⁰Rexmond C. Cochrane, *Measures for Progress: A History of the National Bureau of Standards* (Washington, D. C.: U. S. Department of Commerce, National Bureau of Standards, 1966).

¹¹*Ibid.*, p. 21.

¹²See Alexander Hamilton, "Report on Manufactures," in Theodore J. Lowi (ed.), *Private Life and Public Order: The Context of Modern Public Policy* (New York: W. W. Norton, 1968), p. 120; emphasis added.

Other reports followed in other administrations, but in the end there was much rhetoric and little federal level action.¹³

Actual national involvement in standard-setting began around 1830 when Ferdinand Rudolph Hassler, then Superintendent of the Treasury Department's Coast and Geodetic Survey, started a collection of standards used in government agencies, customhouses, and similar locations. According to Cochrane,

. . . Hassler found no two customhouses in the country where the pound or the bushel were the same, the great discrepancies producing "inequalities in the duties levied at different ports." In fact, "hardly any customhouses have actual standards. All equally refer, for weights and measures of any kind, to the city sealers of the place or those appointed by the respective states."¹⁴

In Hassler's efforts were the roots of the first Office of Weights and Measures which was originally found within the Coast Survey. The purpose behind these efforts: to aid the expanding commercial and industrial communities in the U. S.

As the economy expanded during the nineteenth century, more and more reliance was placed on government action in the area of standardization. However, this was occurring primarily at the state level. The developing (and soon to be prevailing) attitude of the times was expressed by a Pennsylvania Supreme Court Chief Justice who, in an 1853 case challenging the use of public funds for the promotion of industry and commerce, commented that,

It is a grave error to suppose that the duty of the State stops with the establishment of those institutions which are necessary to the existence of government: such as those for the administration of justice, preservation of the peace, and the protection of the country from foreign enemies . . . To aid, encourage, and stimulate commerce, domestic and foreign, is a duty of the sovereign as plain and universally recognized as any other.¹⁵

Such attitudes became manifest in many government actions during the technological and industrial revolutions of the post-Civil War period. During that time considerable pressure was brought to bear upon Congress

¹³Some of these reports are regarded as "classics"; for instance, frequent mention is made of John Quincy Adams' 1821 report recommending means for establishing and enforcing general weight and measure standards in a federal system. See Cochrane, pp. 21-23.

¹⁴*Ibid.*, p. 25.

¹⁵Quoted in Andrew Shonfield, *Modern Capitalism: The Changing Balance of Public and Private Power* (London: Oxford University Press, 1969), p. 304; emphasis added.

to expand the federal government's role in developing and enforcing standards and other mechanisms through which trade, commercial technology, and manufacturing could thrive. Commercial interests involved on the frontiers of technological innovation and scientists working for them were especially prominent in applying the ever increasing pressure. They knew the commercial and scientific advantages to be gained from a formalized, nation-wide set of weights and measures. In addition, they had the positive examples of the industrial powers of Europe to use as evidence in their fight. Congress responded slowly but consistently. In 1873 it greatly increased appropriations to the Office of Weights and Measures; in 1882 it separated that Office from the Coast Survey; and, finally, in 1901 Congress authorized and funded the National Bureau of Standards (NBS) to be the "source" and custodian of national standards used in science, engineering, manufacturing, commerce, and education.¹⁶

While some regarded NBS as a purely "scientific" agency, little doubt as to its principal functions could be found when, in 1902, it was moved from Treasury to the new Department of Commerce and Labor. Arguing for such a change, one member of the House noted that the Bureau "necessarily goes into a department primarily devoted to manufacturing and commercial interests and . . . is destined to exercise great influence upon the development of business and commerce of our country."¹⁷ Thus, the creation of the Bureau at the turn of the century was a manifestation of the needs of a growing marketplace for comparative and coordinating standards which were centrally determined and sanctioned.

Even during the Progressive Era when the value of business practices often came into question, the utilization of control standards as a means for regulation was not significant. The Progressive movement focused its criticism primarily upon the disturbing trend toward increasing monopolization in industry. Other reforms at the federal level took a back seat to anti-trust activities, including the protection of consumers and workers. The secondary status of these reforms and regulations was noted by Richard Hofstadter who attributes their passage to the climate of opinion created by the main "trust-busting" thrust of progressivism.¹⁸

When standards were used as a public policy tool during this period, they were typically not of the "control" type. For example, under the 1906

¹⁶Cochrane, pp. 33-47.

¹⁷*Ibid.*, pp. 68-69.

¹⁸Richard Hofstadter, *The Age of Reform: From Bryan to F.D.R.* (New York: Vintage Books, 1955), pp. 238-256. Also see Lewis L. Gould, *Reform and Regulation: American Politics, 1900-1916* (New York: John Wiley and Sons, 1978).

Pure Food and Drug Act all prescription drugs were to follow composition standards set forth in the *United States Pharmacopoeia* and the *National Formulary*. Those formulary documents, first published in 1820 and 1888 respectively, represented efforts by the medical and pharmacy professions to coordinate production capabilities and provide a uniform prescription and dissemination system for the remedial solutions.¹⁹ What government provided in the 1906 legislation was a sanctioned administrative mechanism through which those comparative and integrative standards would be advertised and enforced. If control for safety or health reasons was a consideration (and no doubt to some extent it was), it was a secondary matter. This is indicated in part by the fact that there were no grounds in the act for the Food and Drug Administration (and its predecessor, the Bureau of Chemistry) to develop or impose objective standards with the intent of accomplishing the ends of consumer or worker protection. As typical of other pieces of progressive legislation which contended with the problems of what American industry produced (as opposed to how they were organized), the Pure Food and Drug Act did not mandate qualitative product requirements nor safe or sanitary production methods. "It was designed to protect consumers by requiring that a medicine's ingredients be stated on a package label. There was no important restriction on the content or use of drugs."²⁰

It was the 1930s before the first major use of control standards was brought to bear on parts of the American industrial complex. The New Deal's promotion and use of comparative and integration standards was evident in the National Industrial Recovery Act and the "codes of 'fair competition'" developed under NRA prior to its being declared unconstitutional.²¹ Again, the stress of standard-setting was on promoting economic activity rather than restricting it for purposes of control and protection. The primary exception to this came as a response to the 1937 Elixir Sulfanilamide episode in which the commercial distribution of a lethal poison as a drug had caused many deaths and intense public outrage. What followed was the Food, Drug and Cosmetics Act of 1938 which made it necessary for manufacturers to submit a New Drug Application to the FDA which demonstrated that a newly formulated composition was "safe" for prescribed use. The safety standard was also applied to food products, and with the imposition of this criterion we find the first major effort to use standards as a means of control. With the passage of the 1962 Amendments to the Food,

¹⁹See William N. Wardell and Louis Lasagna, *Regulation and Drug Development* (Washington, D. C.: American Enterprise Institute for Public Policy Research, 1975), Chapter 1.

²⁰Sam Peltzman, *Regulation of Pharmaceutical Innovation: The 1962 Amendments* (Washington, D. C.: American Enterprise Institute for Public Policy Research, 1974), p. 6.

²¹See Robert A. Solo, *The Political Authority and the Market System* (Cincinnati: South-Western Publishing Co., 1974), pp. 81-82.

Drug and Cosmetics Act reliance on control standards came to dominate the work of the FDA.²²

Besides the increasing use of control standards in the food and drug area, there were other manifestations of the trend in legislative actions taken during the 1960s. Perhaps the major indication of this was in legislation that followed the publication of Ralph Nader's *Unsafe At Any Speed* in 1965 and the concern for environmental conditions which came to the fore at the end of the decade. By the early 1970s the utilization of control standards was evident in the work of several newly organized agencies (e. g., the Environmental Protection Agency, the Consumer Products Safety Commission, the Occupational Safety and Health Administration) and the basic statutory authority under which they worked (e. g., the 1970 Clean Air Amendments, the 1972 Water Pollution Control Act Amendments, the Consumer Product Safety Act of 1976, and the Job Safety and Health Act of 1970).²³

Thus, until recently federal standard-setting activities were essentially comparative and integrative, following the industry-serving purposes which dominated throughout most of our history. Through agencies such as the National Bureau of Standards, the federal government accomplished what Hamilton and others had suggested in the early years of the Republic. But as we moved into the second half of the twentieth century, the emphasis changed from industry-serving to industry-controlling. Demands upon government to act as a regulator as well as promoter of commerce and industry has had its impact. Not only are new agencies being created to reflect this functional shift, but old line entities such as the Bureau of Standards are reorienting themselves. In the areas of health, safety, consumer protection, and the environment, pressure for change has come from consumers, organized labor, ecologists, and others who feel in need of protection from an increasingly powerful and impersonal marketplace. It is under such pressures that standard-setting problems began to manifest themselves.

Control Standards as a Multiattribute Problem

The change in function for governmentally determined standards did not at first cause any significant problems. The flexibility of extant standards made it easy for government bureaus to adapt comparative and integrative

²²Peltzman, pp. 6-7; also Rita Ricardo Campbell, *Food Safety Regulation: A Study of the Use and Limitations of Cost-Benefit Analysis* (Washington, D. C.: American Enterprise Institute for Public Policy Research, 1974), p. 3.

²³See the summary of environmental legislation and standards in Walter A. Rosenbaum, *The Politics of Environmental Concern*, 2nd edition (New York: Praeger Publishers, 1977).

standards to control purposes. This was, in fact, the typical strategy applied. OSHA's first standard-setting efforts are a prime example. In response to its mandate issued in the Williams-Steiger Job Safety and Health Act of 1970, OSHA promulgated an initial package of standards on May 29, 1971. These "consisted of a collection of requirements taken from the national standards of the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA), along with a few established standards which were those in effect under other federal acts. . . ."²⁴

Such an approach was not out of line with government's traditional reliance upon and adoption of private sector standards (e. g., consider the source of standards under the 1906 Pure Food and Drug Act mentioned in the previous section.) But this approach must be evaluated on grounds more substantial than tradition or ease of adoption. What we desire of standards used for purposes of control is much different from what we seek from those commonly utilized as comparative or integrative tools. While comparative and integrative standards may have some of the attributes necessary for an effective and enforceable control standard, there is no guarantee that this is in fact the case.

To a certain extent, it is evident that those charged with the task of setting standards were well aware of the dilemma they faced when they chose to adopt non-control standards. OSHA, for example, has been frequently criticized for the regulations it issued during its first months of existence and has since made efforts at developing its own standard-setting capacity, especially through HEW's National Institute of Occupational Safety and Health. But developing those capabilities is only half the solution to the problem of control standard-setting, for it is also obvious that those involved in standard-setting need some basis for their actions. The principle question becomes: What characteristics do we expect of a control standard? What qualities should it have which will enhance its utility as a means for protecting the health and safety of the American public?

These are not easy questions to answer. For one thing, by posing them we challenge decision-makers to avoid easier paths to standard-setting. Second, we are asking them to establish criteria which can be used by others to evaluate the very work they perform. But most importantly, we are giving them the task of defining what attributes should be optimized by the standard-setting process.

²⁴See the discussion of OSHA standard-setting by John A. Proctor who was head of that agency's Division of Safety Standards; in *Occupational Safety and Health: A Transcript of a MAPI Seminar* (Washington, D. C.: Machinery and Allied Products Institute and Council for Technological Advancement, 1973), pp. 79-89.

This is no easy challenge, for like many other public sector decisions, control standards are complex phenomena which cannot be simply summarized along one or two dimensions. Control standards are what policy analysts term "multiattribute problems." Put briefly, these are problems posed for policymakers where the objective is to select that policy choice (i. e., control standard) which optimizes specified attributes which have been deemed desirable.²⁵ The task of providing detailed definitions of such attributes must be left to further study. However, it is possible to consider several characteristics that are likely to be included on any such list and to discuss the extent to which they force us to differentiate between control, comparative, and integrative standards.

What should we expect of control standards? First, we ought to look for standards which are *feasible*; that is, that can be complied with given present or potential resources and technology. In short, any control standard being considered must be realistic and within the realm of possibility. Given present capabilities, it is unlikely, for instance, that a control standard mandating the complete elimination of pollution emission from internal combustion engines can be met. A standard-setting mechanism which fails to take into account the limitations of the "real world" has a high probability of producing infeasible control standards.

There is little in this first attribute which can be used to differentiate between control and comparative or integrative standards. In the case of comparative standards, it is perhaps logical to argue for qualitative standards which posit criteria which no current producer can achieve. Under such circumstances this ideal can be used as a basis for comparing all current production against a common measure. As for integrating standards, one can find case studies in the area of personnel administration and organizational behavior where profiles have been issued stating the ideal physiological or psychological attributes an individual should have to "fit" into a certain position or perform a specified task. Usually, however, comparative and integrative standards (like control standards) should be realistic and feasible in the sense described here.

Second, standards used for control ought to have a minimal level of *acceptability* for those concerned. Control standard-setting mechanisms can ignore acceptability only at the risk of "throwing out the baby with the bath." For instance, the government might mandate levels of emission controls which, while feasible, render the production or consumption of

²⁵On the concept of multiattribute problems, see Edith Stokey and Richard Zeckhauser, *A Primer for Policy Analysis* (New York: W. W. Norton and Co., Inc., 1978), Chapter 8.

internal combustion engine vehicles undesirable. In this sense, too, standards must be realistic. Standards which control are usually intended to regulate, not eliminate, production.

Here again one finds little basis for the distinction between control standards and their comparative and integrative counterparts. Unacceptable comparative categories can be ignored under some circumstances. If a producer is not required by law to specify how a particular item compares relative to some set of qualitative criteria, then it is probably going to be advantageous to ignore such categories or use only those which reflect favorably upon the item being marketed. Yet even where such comparative standards carry the sanction of law, unacceptability poses a major problem which must be overcome. As the infamous Volstead Act of the Prohibition Era demonstrated, legally sanctioned forms of behavior are not always legitimate in the eyes of those upon whom they are imposed. The end result may be less than desirable behavior and ultimately problems with enforcement. If, for instance, the standards applied by the Department of Agriculture to various meat and dairy products were not acceptable to the many farmers and food processors who use them, there would no doubt be an enforcement problem of considerable magnitude. Thus it is easy to see why acceptability is an attribute not limited to control standards per se. Of course, much the same argument can be made for integrative standards, for a lack of acceptability among the parties being coordinated through them can only lead to chaos.

Third, control standards, especially when related to issues of safety, environmental health, and so on, ought to be *reliable*. By this we mean that they should be technically valid. Such a criterion might not prove extremely important for standards of integration or comparison. Comparative and coordinating standards are tools and "yardsticks" which can be preset somewhat arbitrarily without adverse effects. Their validity then depends on the strictness with which they are applied once established; however, their establishment remains a matter of considerable subjective choice. Control standards, on the other hand, seek to achieve external goals such as the minimization of pollution or the attainment of a level of safety. In such cases it is not enough to pre-establish standards without concern for their relationship to the problem being "solved" through their application. One must know about levels of pollution: which are safe, which are dangerous for human health, which have an immediate effect, which have a cumulative impact, etc. Control standards ought to be set in accordance with that knowledge, and they should be valid and reliable responses to the

problem as determined by such knowledge. Thus, while one may seek to evaluate comparative and integrating standards according to the consistency of their application, control standards should be assessed according to their technical reliability.

Fourth, control standards ought to demonstrate a considerable degree of *flexibility* in their application. By this we mean that control standards must be developed in a way which facilitates their use under a variety of circumstances. What must be avoided is the kind of rigidity and narrow specificity which plagued OSHA for years. To demand that a fire extinguisher be located a given number of inches from the floor or that toilet facilities must be within a specified distance of field workers on a farm may be warranted on legal grounds, but to be so specific may in fact render the standard bothersome and useless. The most typical forms of such standards are found at the local level where municipal building codes often demand that only certain types of construction material be used or that the distance between nails be X inches, no more and no less.

To attain the proper level of flexibility, standards should be set on the basis of performance wherever possible. Thus a house built along the coast of the Gulf of Mexico or in the mountainous areas along the eastern slope of the Colorado Rockies should be capable of withstanding hurricane force winds. Similarly, standards for emissions control can be set to reflect the objectives (levels of pollutants emitted) being sought rather than the means for achieving those goals. The use of performance standards is one way of achieving increased flexibility in control standards, but it does have its limits. The point is that any control standard, no matter how specific it must be, should be flexible.

Is flexibility a desirable characteristic for comparative or integrative standards? Under certain conditions the answer is yes, for comparisons and attempts to coordinate human activity may have to vary from place to place. Nevertheless, the need for flexibility is far less important in these two functional areas than in regards to control. Comparative criteria applied to certain products by government inspectors should not vary from location to location. What is Grade A in Chicago should be Grade A in Phoenix unless there are extenuating circumstances which justify some flexibility. As for integrative standards, the forty hour week used in union contracts and state laws governing pay rates should be the same no matter the place or type of job involved. In short, while flexibility in application may be a desirable attribute for control standards, the opposite holds true for many comparative and integrative standards.

The fifth and final criterion for evaluating control standards we consider here deals with characteristics of the standard-setting process rather than of the standards themselves. Control standards, in the sense defined here, are public sector impositions upon specific portions of the private sector. They are intended as means for protecting or achieving a "public interest," i. e., the health, safety, or welfare of the public. Given this function, it is appropriate to evaluate control standards in terms of how they are formulated. For present purposes we will call this criterion *involvement*, and hold that the greater the involvement of actors "relevant" to the subject of standardization, the more open the standard-setting process and thus the more likely the legitimacy of the resulting standard.²⁶ (It should be noted that we are not assuming high levels of involvement and openness necessarily create "better" standards. What are created are standards more likely to be adhered to.)

The desirability of involvement for setting comparative or integrative standards is not very high. Although consumers and workers may get involved in the procedure by which product grades are determined or production techniques are coordinated, their role does not seem as crucial for the legitimacy of the resulting standards as it would for control standards. This does not mean that involvement is not a consideration for setting comparative or integrative standards, but rather that the involvement is of a much more limited nature in these areas. The determination to use a certain grading system will have to be a matter for producers to consider as a group and their involvement might be regarded as important. Similarly, when members of an industry decide to utilize certain weights and measures in their production or to establish and systematize the interchangeability of parts, the cooperation of a limited number of relevant parties is indeed called for. But it is only in the process of establishing control standards that involvement and the legitimacy it produces is an attribute valued unto itself rather than as a means for merely achieving some agreement.

As is the case with most of the multiattribute problems faced by policymakers, the setting of control standards in a way which would maximize each of these five attributes is an impossible task. It should be obvious that a major part of the difficulties involved is derived from the fact that several of these attributes are inherently contradictory to the attainment of other ends. Increasing involvement is likely to reduce the possibility that a reliable standard can be developed. It is also probable

²⁶Legitimacy as used here implies more than a concept with consummatory value, for the greater the legitimacy, the greater the likelihood for compliance the government might obtain with a minimal expenditure of resources.

that what may be reliable may not be flexible, or that an acceptable standard may not be feasible and vice versa. It is in this context that we usually ask the standard-setting policymaker to accomplish the difficult task of establishing a control standard which will optimize the achievement of these various attributes. To this end we must face up to the fact that perhaps we are asking too much of the policymakers who are charged with standard-setting responsibilities. With this in mind we now turn to an examination of the various methods used in setting standards to see what problems arise from attempts to decide on a given control standard from among those available.

Modes of Standard-Setting

With the shift in concern to control functions and the implications of that change on criteria applied to the development of standards, it is not surprising that we should now turn to a discussion of procedures used in determining specific standards. There are, of course, an infinite number of factors which determine and give shape to any public sector decision, and it would be presumptuous at best for us to assert that all the problems of contemporary standard-setting can be reduced to the procedures used in adopting them. Nevertheless, one can argue that the decision-making process applied in the task of setting control standards has a significant impact on the policy ultimately adopted. There are alternate means for deciding which standard shall be designated as appropriate to a given situation at a certain time, and what each method produces will not necessarily be of equal value. If our objective is to establish control standards which optimize the combination of attributes we set forth in the previous section, then there is much to be gained from a careful examination of the process by which standards are determined.

This examination begins with an overview of the possible modes of standard-setting from which policymakers may choose. There are various means available ranging from the subtle machinations of the uninhibited marketplace to the mandates of stringently applied governmental commands. In their classic *Politics, Economics, and Welfare*,²⁷ Robert A. Dahl and Charles E. Lindblom posit a general typology of social processes which can prove useful in summarizing the various modes of standard-setting under examination here. Each of the four types they set forth (spontaneous field control, manipulated field control, reciprocity, and command) has its own unique qualities and seems to reflect the major approaches now utilized.

²⁷Robert A. Dahl and Charles A. Lindblom, *Politics, Economics, and Welfare: Planning and Politico-Economic Systems Resolved Into Basic Social Processes* (New York: Harper and Row, 1953), esp. chapter 4.

Standards set using "spontaneous field control"²⁸ are ideally determined through the "invisible hand" of the marketplace. Buyers and sellers supposedly come to the market with demand and supply schedules which specify the quality as well as the quantity of goods and services exchanged. In this system, standards are determined over the long run as tastes and styles become institutionalized in response to behavioral consistencies developed in and through a great number of exchanges. Expectations evolve and both buyers and sellers come to the marketplace assuming certain qualities are present in the products made available and those demanded.

We see a form of this standard-setting mechanism at work constantly in what we term "style." When entering a clothing shop we expect to find items for sale which reflect current trends in fashion; before the day of state and federal intervention, when we went to purchase an automobile we would expect certain vehicle performance levels and design characteristics; and so on. Some of these standards endure for long periods of time, while others change as the whims of consumers or producers shift. In either case, the presence of such standards are as natural to the marketplace as the mechanisms involved in their establishment.

Manipulated field control facilitates standard-setting through several processes, most important for present purposes being "demand aggregation."

A manipulated field control . . . is deliberate action on another person's field . . . in order to secure a definite response, by manipulating signals about rewards and deprivations, or both.²⁹

The demand aggregation process works through manipulated field control mechanisms by having the buyer of great quantities of specific goods demand that those goods be of a certain quality, i. e., meet a specific set standard.

A private sector example of demand aggregation is found in the relationship between appliance and automobile manufacturers and steel producers. Auto and appliance makers, using the magnitude of quantity demanded, are capable of establishing the quality of sheet steel required for their use. Steel producers, on the other hand, supposedly must meet the quality standards established by the auto makers or forego the sale. This type of standard-setting capability is distinct from the spontaneous field control mechanism because of the near monopoly power of various manu-

²⁸*Ibid.*, pp. 99-104.

²⁹*Ibid.*, pp. 104-106.

facturers (a prerequisite for such a standard-setting process) and the inability of steel makers to counter such an aggregation of purchasing power.

Increasingly frequent use is made of the demand aggregation mechanism by agencies of the federal government such as the General Services Administration (GSA) and the Department of Defense (DoD). Through their massive procurement activities, GSA and DoD are able to mandate product standards which must be satisfied by suppliers. The NBS Experimental Technology Incentives Program (ETIP) has attempted to make conscious use of the government's demand aggregation power to establish market-wide performance criteria for the lawn mower industry. Standards for the noise level and energy consumption of lawn mowers were established through data analysis and research at NBS. Through market studies ETIP determined that government purchases had a substantial impact upon lawn mower sales. Faced with a government demand for mowers which met established performance criteria, the lawn mower industry would have three alternatives to choose from: 1) forego the opportunity to supply the government's needs; 2) produce two lines, one for the private sector and one for government; or 3) convert their entire production line to comply with the standards. In their current effort, ETIP hopes the third alternative would be adopted.

The third form of standard-setting uses a form of social process termed "reciprocity." Dahl and Lindblom define reciprocity as a bilateral or multilateral relationship "in which two or more people are controlling one another through command or manipulation of fields or both . . ." ³⁰ In standard-setting there are two common mechanisms which can be classified as reciprocal: proprietary and consensus.

At its simplest, the proprietary system sets standards through an agreement among producers. These standards are normally established under the auspices of a trade association, and are primarily designed to benefit (or at least not adversely affect) the association members. The development of proprietary standards is often occasioned by internal pressures, i. e., the need for interchangeable facilities such as railroad cars, life boats, plumbing supplies, and sundry other items. Other times these standards are used as a means of defending against threatened external intervention, as is evidenced in the following comment by the Technical Director of the Association of Home Appliance Manufacturers:

In today's society, any industry as conspicuous as the major home appliance industry is continually faced with the threat of government

³⁰*ibid.*, p. 109.

regulation. The only way to avoid governmental regulation is to move faster than the government. The alternative to governmental regulation . . . is judicious self-regulation.³¹

David Hemminway describes proprietary standards as follows:

. . . industry wide measurement standards are primarily definitions. They represent agreement on how best to measure certain aspects of the product in question. They are economically useful in that they decrease negotiation costs, facilitate product comparison, and lessen the possibility of misunderstanding. Common examples of such standards include methods for measuring various characteristics of tuners and amplifiers, for determining refrigeration capacities and even for measuring office floor space.³²

The use of this reciprocity approach is not a recent development. There was something similar inherent in the guild system of medieval times and the various eighteenth and nineteenth century efforts to establish various comparative and integrative standards in the U. S. (e. g., the example of the *United States Pharmacopoeia* and *National Formulary* cited earlier).

In the consensus system, producers seek both legitimacy and verification of their standards from a wider audience. That audience can include, among others, professional engineers, academicians, lawyers, consumer representatives, labor representatives, other trade associations, and so on. The consensus process for many industries has found formalization in the American Society for Testing and Materials (ASTM). ASTM is organized into technical committees which, upon the request of a corporate ASTM member, undertake the development of specific standards. These standards are then distributed for review to parties ASTM believes would be interested in the standards. Any serious reservations must be considered and resolved before ASTM will officially adopt and publish a standard as its own. If an objection is raised, the path to solving it is usually compromise, bargaining, and perhaps even logrolling among the contending parties.

The consensus method is the one most frequently utilized by regulatory organizations such as OSHA. That agency's adoption of ANSI and NFPA standards (noted earlier) represented a conscious decision to rely on standards developed under a consensus system. In addition, the chief of OSHA's Division of Safety Standards had expressed his intention to continue that agency's reliance on standards developed through consensus mechanisms.

³¹Quoted in David Hemminway, *Industrywide Voluntary Product Standards* (Cambridge, Massachusetts: Ballinger Publishing Company, 1975), p. 69.

³²*Ibid.*

The voluntary standards sector as represented by ANSI and NFPA continues to produce standards which are considered national consensus standards, and which OSHA will consider for promulgation as federal standards in the future. . . .

The American Society for Testing and Materials has recently gained recognition of their standards by OSHA as national consensus standards, and we expect to draw on them for our future needs. . . .³³

In addition, standard-setting mechanisms structured within OSHA's own shop reflect a commitment to consensus methods. Under this approach, HEW's National Institute of Occupational Safety and Health (NIOSH) is given the task of setting forth "criteria for selecting priorities in the future." These, in turn, are given over to various ad hoc and standing "advisory committees" within the Department of Labor which examine NIOSH's suggestions and prepare recommended standards which the Secretary of Labor may or may not adopt as officially sanctioned policies to be implemented by OSHA. The membership of those committees are mandated to be "balanced" by including representatives from employers, labor, technical experts, federal and state officials, and other relevant actors.³⁴ The similarity in approach between this method and those used by ANSI, NFPA, and ASTM are more than coincidental. They are explicit attempts to adapt privately established standard-setting methods to public sector tasks.

To "command" is to establish a standard from "above" through the use of direct threats. This is standard-setting utilizing little or no officially sanctioned input from parties outside the group of decision-makers who are located in a superordinate position relative to those upon whom the standard is imposed. According to Dahl and Lindblom,

To command is to control the response of a subordinate *exclusively* by virtue of a penalty prescribed by the controller for non-performance of an implied or stipulated directive, so that the subordinate expects that his failure to respond as directed will result in the initiation of penalties by his superior.³⁵

Command methods of standard-setting are often perceived as inherently arbitrary although this is not necessarily true. Behind many standards set through command mechanisms there is much evidence gathered meticulously through expert research. In 1972, for instance, the Secretary of Commerce established minimum standards for the flammability of children's sleepwear. (The authority for establishing minimum flammability

³³See Proctor's comments in *Occupational Safety and Health*, p. 82.

³⁴*ibid.*

³⁵Dahl and Lindblom, pp. 106-109.

standards, as set forth in the Flammable Fabrics Act of 1967, has since been transferred from the Secretary of Commerce to the Consumer Product Safety Commission.) The establishment of that standard meant that any manufacturer of children's sleepwear was thereafter required to produce products complying with set minimum levels of flammability in order to remain active in the market. The basis for this decision was not in a consensus developed among relevant parties, but rather the result of many months of carefully designed research by scientists in the National Bureau of Standards.

Still another form of standards developed through command was found in the tendency of Congress between 1970 and 1972 to mandate future emission standards for major sources of pollution. Prior to the 1970 Clean Air Act Amendments and the 1972 Water Pollution Control Act Amendments, standard-setting in this area was left to the states and (where they failed to act in a way deemed satisfactory by certain federal officials) certain designated agencies in Washington. In both pieces of legislation national standards for both allowable emissions and the quality of the environment to be achieved were set forth quite explicitly. The Clean Air Act Amendments, for example, mandated a 90 per cent reduction in auto emissions by 1975, while the 1972 legislation stipulated a zero-discharge level for water pollution sources by 1985. Such determinations seemed to be the result of the "heat" created by political battles of the time, and to that extent this standard-setting method is susceptible to a charge of arbitrariness. Adjustments made in these standards since their passage seem to substantiate this view.

Given these four types of standard-setting processes, the question we must next explore is to what extent can the attributes we seek for control standards be optimized through each method? To some degree, each of the four processes is relevant to the five attributes we seek to find in control standards. Calculating to what extent a given mode of standard-setting is likely to optimize those attributes is a task beyond the scope of this paper. However, it is possible to speculate about the estimated potential of the four modes to achieve that objective given the basic information we have regarding each approach.

For example, spontaneous field control is likely to provide acceptable standards, for it is a method that relies upon agreement between the parties involved in market exchanges. It also facilitates the development of standards which are flexible — perhaps to a fault since much depends on style, taste, and the momentary whims of buyers and sellers. In addition, standards produced through these methods are bound to be feasible in the long run since buyers will only demand what is possible for sellers to offer.

Problems arise, however, in the areas of reliability and involvement. There is nothing in the process of standard-setting through spontaneous field control which guarantees a high potential for technically valid standards. This is a major drawback, for while reliability may not be a significant concern for the length of skirts or the comparative grading system used for meat (only consistency of measurement matters for grading and other forms of comparison), it is crucial for standards used to protect public health and safety. The control standard has a purpose which goes beyond coordination or comparison. A technically unreliable standard can cause a child's death were its pajamas found to be not sufficiently inflammable; it can impair hearing or take off a hand if incorrectly set for the construction of a lawn mower; and so on.

The involvement of relevant actors is also a significant problem since participation in spontaneous field control systems is by definition limited to specific buyers and sellers. The health and safety needs of these individuals may be met through this standard-setting system, but then we face the inevitable problem of spillover effects. There are few products which have the exclusion property necessary to avoid spillovers; and in fact, there are more and more spillover effects being brought under the jurisdiction of government regulations each year. The failure of the unregulated marketplace to produce automobiles with low pollution emissions is just one example of the lack of involvement of relevant parties in a spontaneous field control standard-setting process. Thus, in this sense as well the marketplace is insufficient as a method for setting control standards.

Demand aggregation and other forms of standard-setting through manipulated field control can potentially guarantee some acceptability and even flexibility. In this process the standard desired by one party to an exchange is assumed to dominate the process. However, the manipulator is often a gambler when it comes to feasibility and reliability. There are no mechanisms built into this method which necessarily indicate ability or willingness of the controlled party to respond. Unlike the situation in the open and spontaneous marketplace, the relationship here is dominated by one party which does not necessarily seek information of the other party before taking action, i. e., setting standards. Nor is the standard setter obliged to formulate standards that fit the potential resources and technology available to the party for whom the standard is intended.

In addition, there is no built-in obligation to determine whether a standard will be valid, although the manipulator may take action in that direction. What is built into this method, however, is the incentive to take a chance, as is exemplified in ETIP's gamble that lawn mower manufacturers

will fall into line. In regards to involvement, this method is again very limited. It rarely, if ever, takes into account or otherwise involves parties who are indirectly relevant to the standards being set.

Standard-setting through reciprocity has a high potential for producing acceptable standards, at least among producers. Similarly, it seems to facilitate feasible and flexible standards by promoting standards which are "realistic." Proprietary and consensus standards, with their roots in agreements among those upon whom the burden of meeting standards falls, are bound to be standards which the proprietors are capable of adhering and adapting to, and although technical expertise may enter the process, there is no guarantee that technical reliability will be a major concern. In fact, reliability often becomes a key obstacle to overcome when those involved seek a standard which will act as a compromise. The cost of agreement, therefore, oftentimes jeopardizes the technical validity of the standard. In addition, the level of involvement is often restricted and is at times consciously minimized. This is especially true for proprietary standard-setting which is limited by nature. Consensus methods broaden the participatory base, but "who gets involved" and "how much the involvement counts" is determined by a restrictive and highly selective process.

Command methods pose an interesting dilemma, for there is nothing inherent in the approach to preclude the optimization of at least four of the five basic attributes. Hypothetically one can expect standards developed through command processes to be feasible, acceptable, flexible and reliable. Whether this is the case or not depends on two fundamental factors in the command process: the arbitrariness of the decision-makers and the nature of the safety or health problem under consideration.

As we have already noted, the command mode is not necessarily arbitrary, but it does have that potential. Decision-makers in a strong superordinate position constantly face the temptation to act in ways which may prevent them from considering whether a particular policy is feasible or acceptable. At times this may be the result of dictatorial tendencies, but it is more likely to be the product of a combination of political pressures and certain unsubstantiated assumptions regarding the capacity of various sectors to adapt to arbitrary demands. The mandate that auto emissions be reduced by 90 per cent by 1975 made such assumptions regarding the auto industry's ability to develop the necessary technology within that short time period and their willingness to maintain high production levels under such restrictions.

Flexibility and reliability also depend to a great extent on the willingness of the decision-makers. Both of these attributes are facilitated by reliance on available technical expertise which can inform the standard-setting process. The ability to seek out and apply such expertise is not a given to be presumed. If the policymaker is so disposed, much of the potential arbitrariness of the command system can be avoided in regard to these qualities.

Yet even the most open-minded decision-maker cannot optimize these four attributes using the command process when the nature of the problem works against them. There are, after all, certain problems which cannot be attacked feasibly or with standards which are going to prove acceptable. We cannot completely rid our air and water of all pollution given current resources and technological capabilities. And even if such a standard were within our reach, it is unlikely to prove acceptable if the costs will be as high as they are likely to be. Similarly, there are some safety and health hazards for which expertise does not exist or a consensus among experts is unlikely given present controversies within specific fields. Under the 1962 amendments of the Food, Drug, and Cosmetics Act, for instance, the FDA is required to make certain that a new drug to be sold in the United States is both safe and effective. Over the years the definition of both those qualities — "safe" and "effective" — has been the source of heated debate among numerous experts. If they cannot agree on such a standard, then how can even the least arbitrary of standard-setting policy-makers be expected to reach a sound and justifiable conclusion? The same point comes up in the matter of developing flexible performance standards. What performance ought we expect of a given product? Just how safe should a toy be? These are matters which demand some degree of arbitrariness under a command process, and under such circumstances this mode is of questionable value.

This situation is further complicated by the constitutional fragmentation which has created, among other things, a bureaucratic pluralism which does not facilitate the command mode of standard-setting. It is not uncommon to find two or more agencies charged with the same task on the federal level, particularly in the realm of regulation. Standard-setting is no exception. For example, while noise abatement has become an increasingly salient issue in recent years, standard-setting for this problem has not been provided through a single agency or coordinated effort among those with jurisdiction. Thus one finds noise abatement standards being issued by the Federal Aviation Administration, the EPA's Office of Noise Abatement and Control, and OSHA. At times these standard-setting activities have taken

place in an antagonistic atmosphere where contentions among the agencies involved proved more significant than issues raised by parties who would be impacted by the specific regulations being promulgated. In 1975, for instance, OSHA held several weeks of hearings on its proposed standards for workplace noise levels. Under those proposals, OSHA would allow for a ninety-decibel noise level over a period of eight hours in any given workplace. The basis for that standard and the implications of sanctioning that noise level were openly challenged at those hearings by EPA's Noise Abatement unit, which felt that the ninety-decibel level was inadequate to protect workers. In the long run, OSHA adhered to its initial proposal. Nevertheless, the incident does reflect one of the major drawbacks to utilizing the command approach to control standard-setting where there might be some basis for disagreement among the technical experts involved.³⁶

In addition, there is the matter of the fifth attribute which to this point has gone unmentioned in our discussion of the command mode of standard-setting: involvement. There is an inherent bias in the command process against involvement on a broad scale. Simply put, the greater the involvement by relevant parties in the standard-setting process, the less reliance there is on command methods of policy determination. A decision-maker in a superordinate position can facilitate involvement by seeking input from parties relevant to the problem for which the standard is being developed. However, to the extent that the decision-maker allows involvement in the actual act of standard-setting, the process is no longer one of command. To the extent that the Secretary of Labor allows some advisory committee or external organization to determine standards for OSHA to enforce, that official is involved in a reciprocal rather than command relationship. In this sense, therefore, the command mode of standard setting precludes the possibility of optimizing the involvement attribute.

Table One represents a comparative summary of the preceding evaluation of the four modes of standard-setting. It should be stressed that the designation of the high or low potential a given process has for the attainment of a certain attribute is speculative at best. What this summation demonstrates is that there is no obvious solution to the problem of standard-setting as it now exists. Each choice in the selection of a decision-

³⁶See Peter Woll, *American Bureaucracy*, 2nd edition (New York: W. W. Norton and Co., Inc., 1977), pp. 102-111. For an interesting look at the dilemmas created for standard-setting by American institutions see Lynton K. Caldwell, "Responsiveness and Responsibility: The Anomalous Problem of Environment," in Leroy N. Rieselbach (ed.), *People vs. Government: The Responsiveness of American Institutions* (Bloomington, Indiana: Indiana University Press, 1975), pp. 300-327.

making process necessitates some trade off among the various attributes which we are assuming to be desirable for the establishment of effective and enforceable control standards. It is a dilemma that is likely to become increasingly annoying as the need for such standards becomes greater over the next decade.

TABLE ONE
POTENTIAL FOR ACHIEVING CONTROL STANDARD ATTRIBUTES

	Spontaneous Field	Manipulated Field	Reciprocity	Command
Feasibility	high	high	high	. . .
Acceptability	high	. . .	high	. . .
Reliability	low
Flexibility	high
Involvement	low	low	low	low

(Three dots in space indicate that the potential is highly dependent upon the specific circumstances under which the standard-setting is taking place.)

Conclusion

In this paper we have offered a general and admittedly superficial picture of the problems which currently plague the standard-setting functions of the federal government. These problems are rooted in three inter-related conditions: the increasing emphasis on control standards; the implications for standard-setting of the shift from comparative and integrative standards to those used for control purposes; and the seeming absence of a mode of standard-setting which can simultaneously optimize the qualities demanded of control standards. The situation is not, of course, hopeless. There is much room for innovation and the application of creative solutions. Combining various approaches to standard-setting under specific situations seems a likely possibility, and it is evident that more attention should be paid to standard-setting procedures and the types of policies they produce. More immediate, however, is the need for those who study and criticize the increasing use of standards as a means of regulation to pay greater attention to the process of determining standards as well as the problems of their implementation and enforcement.