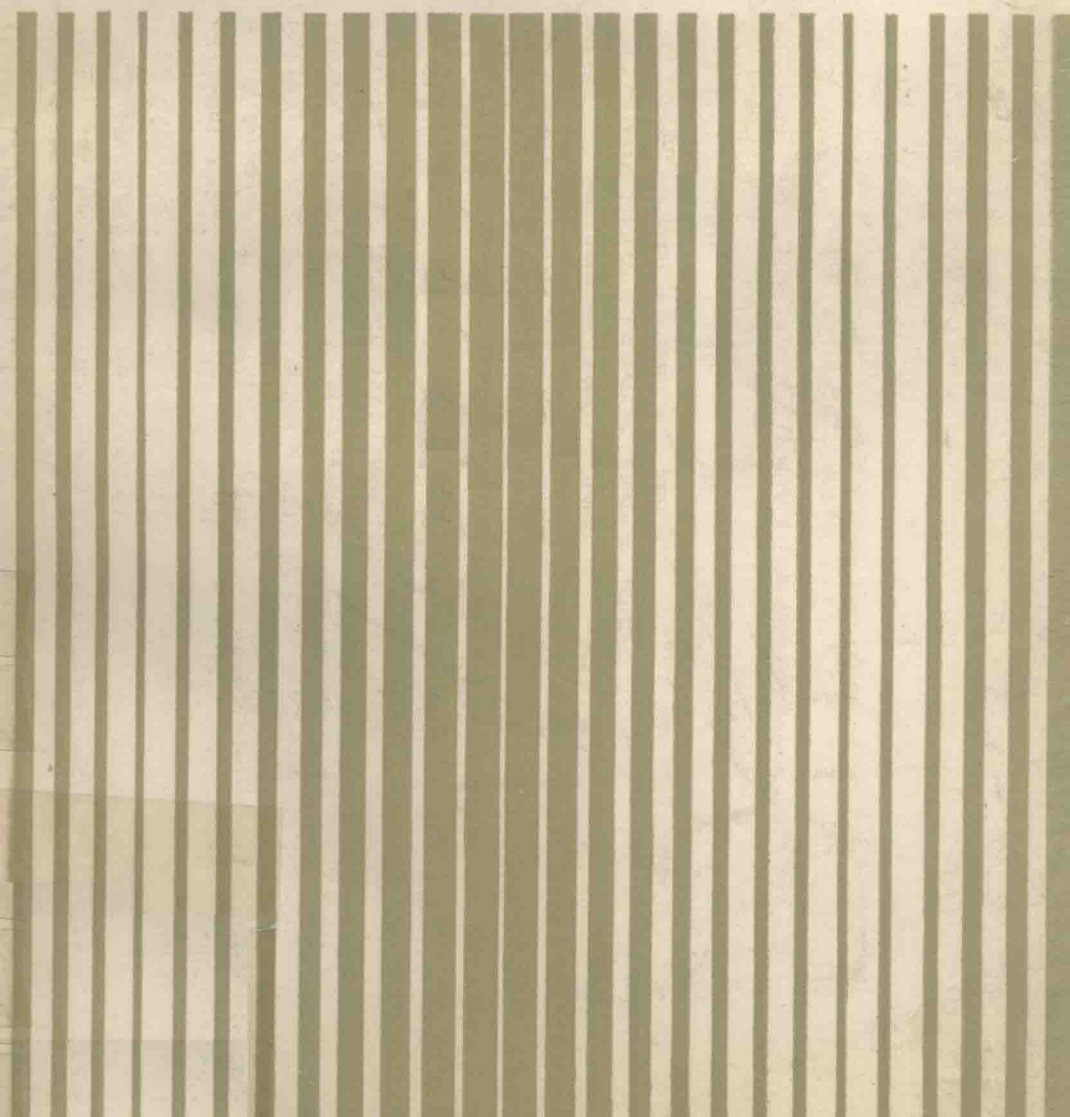
Large-Scale Policy Making

Paul R. Schulman



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A lake allows an average father, walking slowly,
To circumvent it in an afternoon,
And any healthy mother to halloo the children
Back to her . . . from their games across:
Anything bigger than that . . . is an 'estranging sea.'

W. H. Auden, "Lakes"

The question of scale is extremely crucial today, in political, social and economic affairs, just as in almost everything else.

E. F. Schumacher, *Small Is Beautiful*

Preface

This book is written at a time of disillusionment. Great skepticism has come to surround government programs aimed at the attainment of major social goals. Recent Proposition 13 style tax revolts are but the latest manifestation of a broadly guaged disaffection. The heady optimism of the early 1960s has given way to major doubts concerning the role of government in coping with conspicuous human problems; indeed, among many citizens the conviction has arisen that "government itself *is* the problem."[1]

Perhaps nowhere is this disillusionment more deep-seated than over government projects involving large-scale commitments of public energy and resources. The "war on poverty," welfare, urban renewal, low-income housing and even space and weapons development policies have all come under increasingly critical attack as hopeless boondoggles and extravagant monuments to bureaucratic inefficiency. The belief abounds that largeness-of-scale is itself a major negative element associated with these

[1]Lowi, Theodore J., *The End of Liberalism* (New York: Norton, 1969) p. xiii.

 policies—robbing them of the imagination, flexibility and responsiveness they require for success.

Yet it appears that, for good or evil, largeness-of-scale has become one of the most distinctive features of modern governmental organization, just as it has come to characterize society itself. The number and variety of immense public organizations have grown dramatically in the modern era. In addition, the *policies* of these organizations have enlarged as well—involving more citizens, higher costs and more elaborate public objectives and societal aspirations.

At the same time, we do not truly understand what largeness-of-scale implies in relation to government and its policies. What defines a "large-scale" government undertaking, and in what ways is it distinguishable from smaller ones? While many decry the "bigness" of government, we hardly begin to comprehend the consequences of scale—the ways in which it actually affects organizational and interpersonal processes.

This book is directed to this gap in understanding. Specifically, it is designed to investigate the question: To what extent does largeness-of-scale make a qualitative difference in the conduct of public policy?

It is essential in undertaking this task to begin by devoting attention to the concept of scale itself: what it has been assumed to mean and what it should mean in the policy context. Understanding the concept of scale is, as we shall see, no easy assignment. The literature of organization theory, for instance, is littered with the charred remains of numerous attempts to define "size" and to relate size to other organizational properties. This literature is as confusing as it is inconclusive. If it teaches us anything, it is that we must avoid overly narrow definitions of scale that index essentially trivial properties. Moreover, there is a relativity implicit in the concept of scale upon which many analytical efforts can founder. How large does an organization, or policy, have to be before it can appropriately be classified as large in scale?

For our purposes scale will apply not to a single narrow variable but to the relationship between multiple properties. Scale implies a notion of *proportion*—the relationship between plural characteristics as those characteristics are subject to enlargement or contraction. This study will attempt to identify a distinctive class of large-scale policy enterprises—enterprises distinguishable on the basis of an unusual proportionate relationship that obtains among their constituent parts. This relationship among policy components or requisites is not reproducible at shifting values for these components, thus rendering large-scale policies "scale-specific" with respect to their behavior and essential character.

Once large-scale policies are identified, we shall see that a

number of secondary characteristics stem from their scale-specificity. Many of these traits raise dramatic challenges to both the analysis of public policy making and the practice of public administration. |xiii|

In explicating the phenomenon of large-scale policy, a comparative analysis will be undertaken of three major public pursuits—each of which has involved high aspirations and each of which has been subject to widespread public attention. These policies are manned space exploration, the "war on poverty" and the "war on cancer." Only one, manned space exploration, is archetypically large-scale in our terms. Its analysis, supplemented by additional examples, will explain the defining traits of scale and illustrate their political and administrative consequences.

The war on poverty and war on cancer illustrate variations on the central theme. They illustrate the ways in which critical scale mismatches can occur between the structural requirements of a policy enterprise and the political environment within which it is forced to operate. These mismatches can take the form of large-scale policy designs encased in restrictive surroundings or essentially small-scale pursuits greatly amplified by expansive and growth-inducing environments. In either case, the proportionate relationship necessary among policy requisites for politically acceptable performance is not obtained.

This study is designed neither to justify nor attack large-scale undertakings, but rather to identify for analysis important characteristics associated with their pursuit. Ultimately, an understandng of these characteristics may allow for more enlightened policy decisions regarding large-scale objectives—decisions that weigh their political costs with potential benefits. At the same time, it is hoped that the theory of scale presented here, beyond its own ultility or weaknesses, will focus attention on the potential explanatory importance of scale to the understanding of perhaps a wide variety of political processes.

Acknowledgments

This study could not have been written without the cooperation and support of a variety of people at many institutions. At the National Aeronautics and Space Administration, Dr. Eugene Emme, NASA Historian, was particularly helpful in orienting the author to the agency and its extensive in-house literature. Thomas Anderson (also of the Historical Office), Jay Holmes and Thomas Ray (both of the Office of Manned Space Flight) gave their time generously and greatly aided the research. I would also like to thank the NASA library staff for the free rein they allowed me in the use of their resources.

At the then Office of Science and Technology, Dr. Harold Glazer displayed great knowledge of both space exploration and the problems of scale. Dr. Carl York was also very helpful. K. Guild Nichols, staff consultant to the House Committee on Science and Aeronautics, offered a number of insights into legislative impacts on the space program.

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|xvi| At the Johns Hopkins University, Matthew Crenson offered many important observations and much useful advice. Nicholas Leggett engaged the author in many lively space-related discussions.

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Contents

1

Introduction: Policy Paradigms and the Theory of Scale

There is an intriguing theme frequently found in works of science fiction, in horror movies, in children's books and occasionally in social satire. It is the idea of giantism: the notion that human beings or other organisms can somehow attain enormous size relative to their environments—well beyond the norm for their species. Such expansion in size is generally accompanied by death, destruction and widespread terror as the giant organism is unable to coexist with a social order of conventional proportions. There is much significance to this theme, for it suggests simultaneously both the importance and complexity of the concept of *scale.*

Perhaps no physical characteristics can as conclusively condition an organism's relationship to its environment as those pertaining to scale. The scale of an organism can directly affect its environmental demands and at the same time condition its response and defense capacities. The relative scale of environmental objects can, in turn, affect the behavior of the organism by triggering or eluding its attention, signaling danger or suggesting vulnerability.

Man, as an organism, can be behav-

iorally conditioned by factors of scale. The scale of man's geographical surroundings can influence the development of government and culture.[1] Scale in human architecture can convey widely differing impressions of importance, grandeur or intimacy. Human size variations can, in themselves, affect life opportunities or impart distinctive psychological outlooks to persons at species extremes.

Given this importance, it is not surprising that the concept of scale has been the subject of widespread (if sporadic) attention within a variety of research disciplines. In biology, for example, it has long been understood that scale affects the metabolic rates of organisms, and that the consequences of enlarging scale can limit their growth.[2]

In economics, the concept of scale has also had an impact. Economies and diseconomies of scale are considered important factors in the analysis of major industrial processes and their organization.[3] Also in historical analysis, scale has been the subject of attention. Historian Karl Wittfogel has argued that large-scale irrigation projects were closely associated with the development of oriental despotism. Wittfogel perceives an important distinction between "a farming economy that involves small-scale irrigation (hydroagriculture) and one that involves large-scale and government-managed works of irrigation and flood control (hydraulic agriculture)."[4]

In spite of these applications, however, scale remains a profoundly difficult and troubling concept. What exactly do we mean when we speak of largeness or smallness of scale? Frequently we allude simply to the external, physical dimensions of an object or organism. But scale implies much more than this. Let us consider the theme of giantism again, by way of illustration.

Many fiction connoisseurs are fascinated by this theme because it appears to possess an intriguing plausibility. On the surface it seems distinctly possible that a living system that exists at one scale could find expression at many others. But scale is a quality deep in causal

[1]For discussion of these scale influences, see such works as Barker, Ernest, *The Politics of Aristotle* (Oxford: Clarendon, 1968) Book VII; Gettys, Warner E., Human ecology and social theory, *Social Forces*, 18 (May, 1940): 469–476; and Thomas Franklin, *The Environmental Basis of Society* (New York: Appleton-Century-Croft, 1925). For a classic discussion of the role of geographical and population scale in the control of political faction, see Madison, James, "Federalist #10" in *The Federalist Papers*, edited by Roy P. Fairfield (Garden City, NY: Doubleday, 1961).

[2]See Telfer, William H. and Kennedy, Donald, *The Biology of Organisms* (New York: Wiley, 1965) p. 203.

[3]See, for example, Townsend, Harry, *Scale, Innovation, Merger and Monopoly* (London: Pergammon, 1968).

[4]Wittfogel, Karl A., *Oriental Despotism* (New Haven: Yale University Press, 1957) p. 3.

texture; it is multifaceted. Scale is, in essence, a concept of *propor-* |3|
tions, entailing the relationship between *multiple* attributes of objects, organisms or systems. This has enormous implications for a wide variety of disciplinary settings within which scale might be considered and, at the moment, for our theme of giantism.

Any living entity is "a *three-dimensional structure*, and as it increases its linear dimensions its surface area will increase as the square of the linear dimension and its volume as the cube of the dimension."[5] Scale increases, in other words, are defined by diverse *types* of growth within an organism—growth that occurs at *differential rates*. At specific scales, these rates may attain critical imbalances. Volume increases mean rapid gains in overall weight. This weight will be gained at a rate out of proportion to increases in the strength and supporting capacity of an organism's skeletal frame. Thus, unless able to alter qualitatively the physical characteristics of their skeletal material, organisms are sharply limited in the relative scale expansions which they can safely accommodate without being crushed under the burden of their own vastly multiplied weight. This is the prosaic reality behind the literary fantasy of living giants.[6]

At the same time, the theme of giantism illustrates the analytical complexity inherent in the concept of scale. Only when we consider multiple dimensions or attributes of a phenomenon in relation to each other is "scale" likely to be applied successfully to the analysis of that phenomenon. Failure to recognize this complexity of the scale concept has led to many research disappointments in numerous disciplinary areas.

Scale and Social Science Applications

The difficulty of scale applications is well revealed in even the earliest efforts to utilize the concept in social science research. Over two thousand years ago, Aristotle asserted that an ideal population density existed with regard to the city state. According to Aristotle:

> Clearly the best limit for the population of a state is the largest number which suffices for the purposes of life, and can be taken in at a single view.[7]

[5]Telfer and Kennedy, idem. (emphasis added)

[6]For an intriguing explanation of this point see Haldane, J.B.S., "On Being the Right Size," in *The World of Mathematics*, Vol. II, edited by James R. Newman (New York: Simon & Schuster, 1956) pp. 952–957.

[7]McKeon, Richard (ed.), *The Basic Works of Aristotle* (New York: Random House, 1941) p. 1284.

|4| Yet Aristotle was quick to admit that a great deal of confusion surrounded the understanding of "social scale."

> Most persons . . . have no idea what is a large and what is a small state. For they judge the size . . . by the number of its inhabitants; whereas they ought to regard, not their number, but their power.[8]

Two thousand years after Aristotle, scale remains a confused concept in the social sciences. Nowhere in this confusion more evident than in research conducted in the area of organization theory. In sociology, political science and social psychology, intensive energy has been expended in efforts to relate the "size" of an organization to other important organizational variables. This research employs a variety of conceptualizations or indices of size, ranging from number of employees or organization members to organizational output, to the value of resources over which organizational control can be exercised.[9] Studies have been conducted to determine the effects of size (however measured) on worker morale, labor turnover and job performance, and upon the structural features of organizations such as levels of hierarchy and bureaucratization.

Yet for all this research, the findings in regard to size are disappointingly inconclusive. Some studies appear to demonstrate that expansions in size lead to an increase in administrative overhead and to a growth of bureaucracy.[10] Other studies, meanwhile, reveal precisely the opposite.[11] Many analyses indicate that a decline in worker morale is closely associated with increases in organizational size. Yet still others assert that employees bring differing aspirations regarding job satisfaction into large and small organizations *to begin with.*[12]

[8]Ibid., p. 1283.

[9]For the personnel concept of organizational size, see Ingham, Geoffrey K., *Size of Industrial Organization and Worker Behavior* (Cambridge: Cambridge University Press, 1970) and Presthus, Robert, *The Organizational Society* (New York: Vintage Books, 1962). For an organizational output definition, see Revans, R.W., Industrial morale and size of unit, *Political Quarterly* 27 (3) (July/September, 1956): 303–311, and Anderson, Theodore R. and Warkov, Seymour, Organizational size and functional complexity: A study of administration in hospitals, *American Sociological Review* 26 (1) (February, 1961): 23–28. Finally, for a definition of size in terms of organizational resources, see Pugh, D.S., Hickson, D.J., Hinings, C.R., and Turner, C., The context of organization structures, *Administrative Science Quarterly* 14 (1) (March, 1969) pp. 91–114. Another example of indexing size by resources is the annual assessment of the "500 Largest Corporations," compiled by *Fortune* magazine.

[10]See Terrien, W.F., and Mills, D.L., The effects of size upon the internal structure of an organization, *American Sociological Review* 20 (1) (February, 1955): 11–14, and Woodward, Joan, *Industrial Organization* (London: Oxford University Press, 1965).

[11]See Melman, Seymour, The rise of administrative overhead in the manufacturing industries in the United States, 1899–1947, *Oxford Economic Papers* 3 (February, 1961): 62–112; and Blau, Peter M., A formal theory of differentiation in organizations, *American Sociological Review* 35 (2) (April, 1970): 201–218.

[12]Ingham, op. cit., p. 29.

The confusion in organization theory is a good illustration of the difficulties encountered in employing even a limited notion of scale in the social sciences. One organizational analysis even concluded that "size may be rather irrelevant as a factor in determining organizational structure."[13]

But conclusions of this type are seriously misleading. They ignore the potential of a more inclusive concept of scale and the fact that the way this concept is operationalized will determine the research results that follow. No correlation is more reliable than the variables upon which it is based. Simply because organizational "size" has been represented by narrow or conflicting indices leading to inconclusive empirical correlates, there is no reason to assume that a similar fate awaits the more expansive variable "scale."

Here we are back to the complexity of the scale concept. Distinctions have been sought between "large" and "small" organizations without the existence of persuasive ideas as to what we should *mean* by those terms. The narrowness of the variables employed in research on organizational size clearly illustrates a failure to recognize the inclusiveness of scale. Scale, again, entails specific dimensions of size, but it implies additionally a consideration of proportions—the relationship between multiple dimensions of an entity as its size increases. It thus seems reasonable to assume that a "large" organization is distinguishable on the basis of more than one structural feature. Restricting an understanding of scale to structural features alone needlessly reduces its utility. Perhaps such variables as the scope of an organization's goals and the nature of its objectives should also be included in an index of scale. The point is that only at a more inclusive level of analysis are distinctions of "large" and "small" likely to be meaningful and significant correlates revealed.

The successful application of the concept of scale to organization theory and throughout the social sciences awaits this type of theoretical refinement. It may not come easily, but the analytical returns from a well-developed notion of scale could be considerable. It is in this decidedly hopeful spirit that this study of large-scale policy enterprises is undertaken.

Toward a Theory of Policy Scale

The intention underlying this analysis is to offer a theory of largeness-of-scale in connection with the policy-making process. Among other things, the theory asserts that largeness-of-scale im-

[13]Hall, Richard B., Haas, J. Eugene, and Johnson, Norman J., Organizational size, complexity and formalization, *American Sociological Review* 32 (6) (December, 1967): 912.

 plies distinctive *qualitative* properties insofar as policy making is concerned. It is useful to recall for a moment the model of the giant organism. Should such an organism exist, it will be remembered, the "laws of scale" would require that it be composed of qualitatively different structural material than its more diminutive counterparts. In the same way, we will argue that a class of large-scale policy enterprises exists with very different characteristics from more conventional policy undertakings of smaller scale. The properties of policies in this class, in fact, diverge sharply from the patterns that the dominant theoretical outlooks of policy analysis and political science would lead us to expect.

Our most immediate task is to outline some definitional criteria by which the constituents of this class of large-scale policies may be identified. What, in effect, shall we mean by large-scale public policy? Given the implicit connection of scale and the notion of quantity, it is tempting to index the scale of a public policy undertaking by focusing on those features most readily observable and most easily measurable—such variables, for example, as the number of personnel associated with the undertaking (or affected by it), the total resources committed to the policy (expressible in dollar equivalents), and the number of organizations or institutions involved in the design or delivery of policy outputs all present themselves for consideration as defining features of large-scale policy undertakings. Indeed, intuitively we conjure up one or more of these traits when we think of the large-scale enterprise.

Consider manned space exploration policy by way of illustration. Space exploration programs at their peak involved over 409,000 persons employed in both the public and private sectors. Exploration has also utilized enormous quantities of diverse resources. Fiscal appropriations from 1961 to 1978 totaled over $60 billion. In addition, major amounts of land were utilized (over 114,000 acres in the Atlantic Missile Range area alone) and important research and testing facilities were constructed. Finally, space policy has engendered a staggering number of interorganizational contacts in its pursuit. These have taken the form of interagency programs, grants and contracts, research conferences, hearings, land purchase negotiations and even international treaties governing the installation and administration of tracking and data acquisition stations.

These are impressive characteristics and space exploration is surely a large-scale policy; yet for important reasons *we will not use these variables as defining factors of scale.* They will be treated, instead, as frequent *consequences* or correlates of largeness-of-scale, but with scale itself defined in a different and qualitatively distinctive way. It is important to explain why this will be the case.