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THE POST-INDUSTRIAL ACCOUNTING ENVIRONMENT:
A CONCEPTUAL FRAMEWORK.

The Louisiana State University and Agricultural
and Mechanical College, Ph.D., 1973
Accounting

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THE POST-INDUSTRIAL ACCOUNTING ENVIRONMENT: 
A CONCEPTUAL FRAMEWORK

A Dissertation

Submitted to the Graduate Faculty of the 
Louisiana State University and 
Agricultural and Mechanical College 
in partial fulfillment of the 
requirements for the degree of 
Doctor of Philosophy 

in 
The Department of Accounting

by 
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ACKNOWLEDGMENT

This author wishes to gratefully acknowledge the assistance of his dissertation committee, composed of Dr. George W. Fair, Dr. Lloyd F. Morrison, Dr. O. Jeff Harris, Dr. S. Kerry Cooper, and especially Dr. James W. Pattillo, chairman.
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THE POST-INDUSTRIAL ACCOUNTING ENVIRONMENT:
A CONCEPTUAL FRAMEWORK

ABSTRACT

In the past decade and a half, accountants have witnessed many controversies concerning the nature of the accounting function and how it ought to be performed in contemporary society. These controversies reveal the growing pains of a profession which is struggling to meet the challenges of a world quite different from the one in which it was originated. The basic objective of this inquiry is to draw contour lines for the socio-economic scaffolding of the post-industrial world within which the accounting function will be performed. In particular, it is an attempt to provide a conceptual framework within the perspective in which the post-industrial accounting function should be performed.

A conceptual framework toward theory construction in the social sciences can be meaningfully provided only within the institutional context and societal setting. Consequently, this inquiry examines the institutional phenomenon of modern technology, and the consequent emergence of the post-industrial society and its organizations. Further, the information needs of such a society and its organizations and what imperatives they provide for a relevant accounting function are discussed.

The inquiry takes a holistic view of the societal processes. The society is viewed as continually seeking an equilibrium with its ever-changing self as well as with its environment. Accounting, as an anticipatory and a feedback information system, seeks to help
society achieve that equilibrium. Like a catalytic agent, it tries to dispel the divergence which exists between the reality of a societal phenomenon and its varied perceptions. This it can achieve only through communication which is neutral, i.e., communication which does not distort the authentic images of the reality.

In the growth-oriented economies of the industrial West, accounting has been effective. In such societies, in general, the market forces predominate, the issues are generally seen in terms of the exchange relationships, and, therefore, are functionally reducible to monetary calculations. In such an environment the conflicting claims are still essentially private, and the measurement and communication function of accounting, in spite of its unidimensionality, still serves the society's needs.

Nevertheless, with the emergence of post-industrial imperatives, such as planning and arbitration, the nonmarket welfare economy, the domineering public sector, and politicized and open decision-making, the effectiveness of traditional market forces has been severely eroded. Above all, the affluence of the post-industrial society brings noneconomic considerations and their resilient multidimensionality to the center stage. The conflicting interests are generally collective and communal, and thus difficult to reconcile primarily on the unidimensional monetary scale. Further, post-industrial multidimensionality is not only pronounced but it also is a factor which cannot be ignored in a pluralistic democratic society.
It is true that even in a post-industrial order the basic accounting function of measurement and communication has not changed. What has changed, and changed radically, however, is the content of that function. The new content—the information to be measured and communicated—is no longer amenable to the traditional unidimensionality of accounting technology. Thus, the inquiry concludes, it is in the resilient multidimensionality of the post-industrial environment that accounting faces its first historic crisis. If accounting continues to march along the primrose path of its traditionally revered dogma of unidimensionality, it will surely fall short of its catholic communication function. In such a failure it would lose its impact on human action, and, ultimately, its public purpose.
It is, of course, true that in the social sciences, as elsewhere, the ultimate criterion of truth or falsity is to be found in the investigation of the object, and the sociology of knowledge is no substitute for this. But the examination of the object is not an isolated act; it takes place in a context which is coloured by values and collective-unconscious, volitional impulses. In the social sciences it is this intellectual interest, oriented in a matrix of collective activity, which provides not only the general questions, but the concrete hypotheses for research and the thought-models for the ordering of experience.

--Karl Mannheim, in *Ideology and Utopia*.

Perhaps the most striking feature of the normal research problems . . . is how little they aim to produce major novelties, conceptual or phenomenal. . . . Even the project whose goal is paradigm articulation does not aim at the unexpected novelty.

--Thomas Kuhn, in *The Structure of Scientific Revolutions*.

To say that an object is real is to anticipate that it will manifest its existence indefinitely hereafter. This is what Copernicus meant by insisting that his system was real. Copernicus anticipated the coming of future manifestations of his system, and these were in fact discovered by later astronomers who had accepted his claim that his system was real. We can conclude then that, in nature, the coherence of an aggregate shows that it is real and that the knowledge of this reality foretells the coming of yet unknown future manifestations of such reality. This concept of reality extended to include all the phases of a scientific enquiry. It explains the way discovery is anticipated, from the sighting of a problem to finding its solution.

--Michael Polanyi, in "Genius in Science."
I. INTRODUCTION

A. Technology in Our Modern Life

The official name of the human species is Homo sapiens, but there are many anthropologists who prefer to think of man as Homo faber: the smith, the maker of tools. Man is the only animal capable of the powerful, nonorganic evolution of tool-making. Tools have been with us from man's earliest times and have always been an intimate and integral part of the human experience.

In fact, as testified by the first earthen pot, the spear, and the mortar, there has never been a time since man emerged from the higher primates when he was not in possession of at least a minimum degree of technology. The irrigation civilizations of some seven thousand years ago existed in what was not only one of the great ages of technology, but was also mankind's greatest and most productive period of social and political innovation. Behind

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all this technology lay the irresistible force of the human mind, extraordinarily restless and dissatisfied, always striving to bring the environment within control to facilitate the business of living.¹

In our own technologically explosive as well as overwhelming age, it is easy to underestimate the role of technology in other ages. It should be noted, however, that in no other age of history has technology held such a central and determining role as it does in our own. Never have so many persons been involved so directly in technological pursuits. At no time in the human past has the technologist-scientist held the crucial societal role that he holds today.²

During the twentieth century, technological activity has changed in its structure, methods, and scope. As British philosopher Alfred North Whitehead, contemplating the effects of technology on human destiny, said: "In the past, human life was lived in a bullock cart; in the future it will be lived in an airplane; and the change of speed amounts to a difference in quality."³


It is this qualitative change which explains, even more than the tremendous increase in the volume of work, the emergence of technology in the twentieth century as vital in war as in peace, and its ability within a few short decades to remake man's way of life all over the globe.¹ "It is in this pervasive influence of technology on our life that the contemporary situation seems so qualitatively different from that of the past societies. . . . One reason for this qualitative difference is that our technological tools are more powerful than any before. The rifle wiped out the buffalo, but nuclear weapons can wipe out man."² At the dawn of the nuclear age, Albert Einstein aptly summarized this change when he said that the unleashed power of the atom had changed everything except our ways of thinking, and that we were drifting toward a catastrophe beyond comparison.³

The domestication of animals and the invention of the wheel literally lifted the burden from man's back, but the computer—which can be seen as an extension of the human mind as a tool is an extension of the human body—could free us from mental drudgery. Whereas the automobile left practically no human institution unchanged, the impact of the computer is likely to be

¹Drucker, Technology, Management & Society, p. 55.


just as great. It seems probable that all existing political and economic institutions will undergo some modification as a result of our modern technology.\(^1\)

The fact that technology stands today at the very center of human experience is verified by our dependence upon it as men once depended upon nature. Our increasingly urbanized society is ever more dependent on technology, and our habitat is no longer a natural ecology.\(^2\) Our major threats are technological breakdowns; for example:

In the late afternoon of November 9, 1905, a small electrical relay in a power station in Ontario, Canada, failed. Within a few minutes the flow of electric


energy throughout much of the Northeastern section of the United States and part of Canada had ceased. Some thirty million people, including those in the great metropolitan areas of Boston and New York, were plunged into darkness. Coming as it did, during the evening rush hour when people were on their way home from work, the shutting off of electric power left hundreds of thousands of New Yorkers stranded in subway trains, confined in elevators stalled between floors of towering skyscrapers, or caught in monstrous traffic jams created by the absence of traffic lights. Even when they finally reached home, many of the now-disconcerted city-dwellers found it to be without warmth, without hot food, and without light. Here was a dramatic demonstration of modern man's dependence on the machine.¹

The quality of finality in modern technology and the degree to which our time is oriented toward and dependent upon science and knowledge have brought our age, more than any before it, to an explicit awareness of technology as an important determinant in our lives and institutions. As a result, our society is deliberately attempting to understand and control technology, and is therefore devoting significant effort to the search for ways to measure the full range of its effects.²

¹Melvin Kranzberg and Carroll W. Pursell, Jr., "The Importance of Technology," in The Emergence of Modern Industrial Society, Earliest Times to 1900, Vol. I of Technology in Western Civilization, ed. by Kranzberg and Pursell, p. 3. Recently, a succession of cable failures at a Consolidated Edison substation in New York cut off power to more than 400,000 people, and left them without air-conditioning or food refrigeration and, in some cases, without water. See Paul J. Montgomery, "More Blackouts in Two Boroughs; 400,000 Affected," New York Times, July 25, 1972, p. 1.

²Mesthene, Technological Change, pp. 25-26. Also, it should be noted that the Congress has appropriated $5,000,000 to set up the Office of Technology Assessment to start operating in mid-1973. This new agency is expected to be able to predict which new technologies are likely to become important and what long-range effects they are likely to have. It is then expected to advise the government which new technologies it should encourage and which ones it should discourage, if not forbid altogether. See Peter F. Drucker, "New Technology: Predicting Its Impact Is Perilous and Futile," New York Times, April 8, 1973, sec. 3, p. 1.
Every society in the world is being profoundly affected by the scientific and technological revolution that started in the Western societies approximately five hundred years ago. In a very real sense, the society of the entire world is being transformed by this revolution, and America is at the heart of this world transformation. Indeed, America is its primary source.

In America, more than anywhere else, science and technology, particularly as socially applied through communications and increasing computerization, are already significantly important in influencing social behavior. Increasingly being shaped by technology and electronics, today's America is in the midst of a transition that is both unique and baffling. It is ceasing to be an industrial society and is already beginning to be a new kind of society where the prominence of technology is overwhelming.\(^1\)

The crucial problem in this technological phenomenon is whether the development of electronics, automation, cybernation, and the whole complex of control systems does not introduce, as it were, a new gear into the evolutionary process, the implications of which are as yet only barely apparent.\(^2\) As in many other areas, however, American technology will serve as an example

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for the other nations to emulate. More than anywhere else, it is in America that the social consequences of the technological revolution are beginning to shape human behavior. It is in American society where the great questions of our time will be tested first in practice: Can the individual and science coexist, or will the dynamic momentum of the latter fundamentally alter the former? Can man, living in the scientific age, grow in intellectual depth and philosophical meaning, and thus in his personal liberty, too? Can the institutions of political democracy be adapted to new conditions quickly enough to meet the crises, yet without debasing their democratic character?¹

¹ Brzezinski, "The American Transition," p. 19. Faith in the American capacity to innovate and lead the world in most areas is fairly widespread. It has certainly been fulfilled in the field of accounting. A comparative study of the development of accounting principles in Mexico, Canada, the United Kingdom, and the U.S.A. shows that all others have borrowed much from the American experience, both in terms of the subjects covered and the conclusions reached. Zeff explains this unique American leadership in terms of its developed securities market, the aggressive financial press, and the accounting philosophy of the Securities and Exchange Commission. See Stephen A. Zeff, Forging Accounting Principles in Five Countries: A History and an Analysis of Trends (Champaign, Ill.: Stipes Publishing Company, 1972), pp. 311-313.
II. ORIENTATION

A. Technology as the Milieu of the Man, Mind, and Matter

Technology, in its simplest form, can be viewed as a rational ordering of means to achieve definite ends. Weber saw it merely as a special part of the rationalization that has been taking place in the Western world over the past several centuries. What is central to technology is the application of rational principles to the control or reordering of space, matter, and human beings.¹ Thus, considering the enormity of its present state, modern technology can also be viewed as man's profound intervention in his environment, both natural and man-made, and his attempts to subdue or control that environment by means of his imagination and ingenuity.

In the popular mind, however, technology is understood in its physical manifestations—the skyscraper, automobile, computer—but technology represents social things as well, such as organizations and institutions concerned with human ends.² Although we


²Nisbet, "The Impact of Technology on Ethical Decision-Making," p. 41. Also, see Kranzberg and Purcell, "The Importance of Technology," pp. 4-5. There is some element of arbitrariness here in defining what technology is. As Drucker points out, however, all human disciplines rest, after all, on similarly arbitrary distinctions. Thus, technologists ought to be conscious of the artificiality of their definition and careful lest it become a barrier rather than a help to knowledge and understanding. See Drucker, Technology, Management & Society, p. 43.
are accustomed to thinking of technology in terms of tools, implements, machines, and gadgets, we should think of it also in terms of human skills, institutions, and organizations. We may interpret a technological system as that aspect of society which is concerned with human artifacts, both material and social, and with the way humans interact with them in the process of producing more such artifacts.¹

There is also a fairly widespread view that the subject matter of technology is how things are done or made, and that the meaning and end of technology are in man's mastery of his natural environment.² The human dimension of technology, however, can be achieved only when we think of it as part of the human endeavor with physical objects to serve human purposes. More than the mere organization of things such as tools, processes, and products, technology's major theme centers around human work—more specifically, the human activity by which man alters his biological capacity. It is through technology that man pushes back the limitations of the biological law which condemns all other animals to


devote their lifetime and energy to keeping themselves alive.\(^1\)

If we view technology as the organization of human work for the achievement of human purposes, that is, in its societal context, we can best see the extent and variety of its effects on our institutions and values. Its pervasive influence on our lives and culture would be unintelligible if technology were to be understood as no more than mere machines. A given technology imposes certain social and political characteristics upon the society in which it is found. Thus, there must be some kind of equilibrium between man and his artifacts—whether stone tools or computers—to preserve a wider ecological balance. Otherwise, man and his artifacts could expand indefinitely, much in the same manner that the human population has expanded so persistently over the course of history without showing any sign of reaching an equilibrium.\(^2\)

Figure 1 shows that man at some level of his population, such as OA, creates artifacts equal to AB, which then permits a

\(^{1}\)Drucker, *Technology, Management & Society*, pp. 45-46. Drucker further suggests that the purpose of technology would thus be to overcome man's own natural, i.e., animal, limitations. For instance, it enables man, a land-bound biped, without gills, fins, or wings, to be at home in the water or in the air. Above all, it enables him to push his life span from his "natural" twenty years or so to threescore years and ten. These and other technological developments of man have, of course, had an impact on his natural environment. But what really matters is that they alter man's biological capacity—and not through the random genetic mutation of biological evolution but through the purposeful nonorganic development we call technology. *Ibid.*

larger human population, OC, which, in turn, creates a still larger quantity of artifacts, CD, and so on. As long as the artifact curve lies above the man curve, the system leads to constantly increasing populations of both without any equilibrium. If there is to be an equilibrium, for instance at E, the curves must converge either through man's artifacts becoming less conducive to his increase, as in the case of the development of nuclear weapons and pollution, or through the earth reaching such an overcrowded condition that man becomes disorganized and loses his capacity for making further artifacts. Such are the dynamics of man, his artifacts, and the larger societal order.¹

Dwelling on these dynamics, Marx suggested that a certain mode of production, or industrial stage, is always combined with a certain mode of cooperation, or social stage. In acquiring new productive forces men change their mode of production, and in changing their mode of production they change their way of living, that is, they change all their social relations. Thus, "the hand-mill gives you society with the feudal lord; the steam-mill, society with the industrial capitalist."²

¹Ibid.
²Karl Marx, The German Ideology, ed. by C. J. Arthur (New York: International Publishers Company, 1970), p. 18. Marx’s basic theme was that the technological conditions of production inevitably determined the patterns of society, and that as these technological conditions of production changed, feudalism inevitably gave place to capitalism, and capitalism in its turn would inevitably give place to socialism. See Robert L. Heilbroner, "Do Machines Make History," Technology and Culture, 9 (July, 1967), 335-345; and James E. Meade, "Is the New Industrial State Inevitable?" Economic Journal, LXXVIII (June, 1968), 374-375.
FIGURE 1

MAN AND HIS ARTIFACTS: AN ECOLOGICAL VIEW

Source: Adapted from Boulding, Economics as a Science, p. 29.
B. A Brief Review of the Literature

Many social scientists have attempted to characterize the emergent American social order with explicit attention directed to its heavy technological orientation. They view the future America as a new civilization based on technology as a single integrating factor, much as some past civilizations were integrated around feudalism, or such ideas as capitalism or liberalism.

Bell speaks of a "post-industrial society," where the economy is largely based on service, the professional and technical classes dominate, theoretical knowledge is central, and intellectual technology is highly developed and capable of self-sustaining growth. Brzezinski describes essentially the same

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2There are some charms of simplicity as well as the shortcomings of simpleness in explaining the larger societal processes through a single phenomenon. Yet, as Kaplan points out, even these simplisms may make scientifically significant contributions, "As Marx did in giving economic factors so prominent a role; or as Spengler did in countering the parochialism of identifying history with the development of our own culture. . . ." See Abraham Kaplan, The Conduct of Inquiry: Methodology for Behavioral Science (San Francisco: Chandler Publishing Company, 1964), p. 369.

3Bell, "The Post-Industrial Society," pp. 102-108. Daniel Bell, more than anyone else, has done much of the pioneering work on the subject of the post-industrial society. In this inquiry,
phenomenon which he refers to as a "technetronic society," but he puts heavy emphasis on advanced communications and electronics when discussing technology. For Brzezinski, advanced communications and electronics are increasingly becoming the determinants of social change, altering the mores, social structure, values, and global outlook of the society. In the same vein, McLuhan refers to a "global village," a new civilization based on a single aspect of technology: the new electronic media which, he holds, constitutes not merely new methods of communication but a totally new environment that will radically alter everything from politics to sexual behavior.

According to Etzioni, we are in a "post-modern era." For him, the modern period ended with the radical transformation of the technologies of communication, knowledge, and energy following the Second World War. The post-modern period will witness either

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I have heavily relied on and extensively drawn from his work in developing the theme of post-industrialism. From the literature it seems that David Riesman was perhaps the first (1958) to coin the phrase "post-industrial society," which he used to connote leisure as opposed to work. However, he did not subsequently follow-up the theme or phrase. See David Riesman, "Leisure and Work in Post-Industrial Society," The Technological Threat, ed. by Douglas, pp. 77-91. Since the present inquiry essentially follows Bell's analysis in describing the emergent post-industrial social order, it also uses his term, "the post-industrial society." As can be seen in this section, however, there have been several other attempts to describe and name the emergent social order as viewed from different vantage points.

1Brzezinski, Between Two Ages, Pt. 1.

a greater threat to the status of values by surging technologies or a reassertion of their normative priority. Which alternative prevails will determine whether society is to be a servant or the master of the instrument it creates.¹

For Dahrendorf, however, we are living in a "post-capitalist society" where authority, not ownership, counts. With the diminution in the legal ownership of the means of production, there is, in consequence, a break between the economic and political orders. It is a post-capitalist society, because relation to the instruments of production no longer decides the dominance or privilege in society.² Similarly, to Lichtheim, contemporary society is increasingly "post-bourgeois," in which the nineteenth century class-structure is being dissolved along with the institution of private entrepreneurship on which it was pivoted.³

Boulding perceives the present age of human civilization as a "rather deplorable interlude in the state of man characterized by exploitation, war, poverty, large-scale misery, as well as by occasional peaks of artistic achievement."⁴ For him, we are at the start of a "post-civilized era" whose distinctive


⁴Boulding, Economics as a Science, p. 150.
characteristic is the consciousness of the sphere of knowledge as the promise for social direction, and the achievement of social, as against individual, self-consciousness.¹

Galbraith suggests that the economic and political consequences of the new order, which he calls "the new industrial state," are dependent upon the imperatives of technology. He asserts that the rise of technology and the "technostructure"--the scientific and technological class--are putting an end to the traditional private capitalism.²

Kenton finds the key to the alienation of many of today's brightest youth in their inability to meet the demands of the ego in the contemporary milieu which he calls "the technological society."³ In such a society, Ellul concludes, technology per se will determine the future, because technology is no longer an instrument for preexisting human purposes, but perhaps has become an end in itself, controlling both men and their society.⁴


⁴Jacques Ellul, The Technological Society (New York: Alfred A. Knopf, 1964). Besides those discussed here, many other authors have attempted to describe and name the interregnum in which, seemingly, we are now moving: Herman Kahn ("post-economic"), Roderick Seidenberg ("post-history"), Sir Geoffery Vickers ("post-liberal"), Tom Burns ("post-market"), A. N. Eisenstadt ("post-traditional"), Gideon Sjoberg ("post-welfare"), etc. See "Current Reading," The Public Interest, Summer 1971, pp. 108-109.
C. Nature of and Need for This Inquiry

For some, much of the accounting function—generally understood as a process of measurement and communication of economic information—is quite suspect. For example, Boulding thinks that the accounting function is essentially an impossible task because in its valuation procedure, which, according to Boulding, is the very heart of accounting, it is involved in the reduction of a multidimensional reality to a one-dimensional figure on the basis of knowledge about the future. Failing to achieve this, accounting slides into rituals which are always the proper response when a man has to give an answer to a question, the answer to which he cannot really know.1

1Kenneth E. Boulding, "Economics and Accounting: The Uncongenial Twins," in Contemporary Accounting and Its Environment, ed. by John W. Buckley (Belmont, Calif.: Dickinson Publishing Company, 1909), pp. 270-288. Also, see W. T. Baxter, "Accounting Values: Sale Price Versus Replacement Cost," Journal of Accounting Research, V (Autumn, 1967), 214. It should be noted, however, that for Boulding valuation is an essentially "present" process arising out of the opinions, beliefs, and sentiments of the owners of physical capital (including money) operating on the stocks of the various forms of physical capital actually in existence at the moment of valuation. See Kenneth E. Boulding, A Reconstruction of Economics (New York: John Wiley & Sons, Inc., 1950), p. 194. Likewise, Chambers also suggests that although entirely subjective and always temporal, valuation is nonetheless necessary, for it is the only alternative to choosing at random. It provides an understanding of the relationships between actions and their consequences in an environment of action. See Raymond J. Chambers, Accounting, Evaluation and Economic Behavior, Prentice-Hall International Series in Management (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1960), pp. 42-43. Boulding has reiterated the same point elsewhere, arguing that the impossibility of the accountant's function is derived from the fact that information about the future which he needs is inaccessible. Thus, what apparently looks like a rational activity (accounting) turns out upon examination to have large elements of rituals within it. See Kenneth B. Boulding, Conflict and Defense: A General Theory, Harper Torchbooks (New York: Harper & Row, Publishers, 1963), p. 95. However, Boulding also points out that nobody has yet developed an
The dilemma of accounting in relation to its basic function is obvious, as verified by the extensive controversies among accountants regarding the aims and principles of their art, particularly since these controversies are revived from time to time.¹ Many of these debates are in essence disagreements over what the subject matter of accounting ought to be, since this has not yet been decided. Thus Sterling asks:

Should the subject matter be costs or values or information? Should we focus on decision makers or on decision models? Should we study the reactions of individuals or their reactions aggregated by the market? Should we supply information relevant to decisions or confine ourselves to the stewardship function?²

Further, since we do not know how such questions will be resolved or which research method will contribute to their resolution, Sterling suggests that "we must tolerate, if not encourage, a variety of research questions from a variety of disciplines adequate theory of information collection and processing from the point of view of the decision-making process. When this is done, he suggests, both accounting and economics may lose their life in a larger science and a larger process. See Boulding, "Economics and Accounting," pp. 287-288. Dahl and Lindblom also similarly note that decision-relevant information concerning the future in most areas is not available now and may not be for decades or centuries, and that, even if it were available, it is unlikely that the obstacles in the way of articulating and coding such information can ever be fully overcome. See Dahl and Lindblom, Politics, Economics, and Welfare, p. 77.

¹Chambers, Accounting, Evaluation and Economic Behavior, p. 9.

utilizing a variety of methods by a variety of specialists."\(^1\)

This inquiry is an attempt to provide a conceptual framework, in the perspective of which some of these questions can be resolved as they relate to the future accounting function. In particular, it is an attempt to provide a profile of the socioeconomic scaffolding within which the accounting function will be performed in the emergent post-industrial order. It will endeavor to delineate how the accounting function integrates within the total post-industrial societal process. The inquiry will deal with the effect of technology in determining the nature of the socioeconomic order, in general, and the accounting function within that order, in particular. The basic issue here is whether and how contemporary technology constitutes the ineluctable cause of a new social order and a renewed accounting function within that order.\(^2\)

\(^1\)Sterling, "Introduction," p. 405. Chambers also begins his stimulating analysis of accounting with some apprehension. Noting that economics is concerned with the distribution of scarce goods among men, politics with the distribution of power among men, sociology with the behavior of men as members of groups, and so on, he wonders: "It seems as though almost every aspect of behavior is covered by some specialism, and that there is no aspect left with which accounting may be concerned." See Chambers, Accounting, Evaluation and Economic Behavior, p. 14.

\(^2\)Thus, Elliott fears that modern technology has rendered accounting obsolete. Recognition and acceptance of this fact are necessary, he says, if accountants are to make meaningful change, rather than fritter away their limited resources trying to repair "the creaking, sagging, old machine." He wants a broader definition of accounting in the context of overall social objectives. See Robert K. Elliott, "Accounting in the Technological Age," The Journal of Accountancy, 134 (July, 1973), 70. Similarly, Bedford suggests that if the accounting function is not reoriented in response to the changing times, a new profession
Accounting is viewed here as a societal function with certain normative patterns covering its internal structure and operation. Its functional legitimacy is derived from its performance in accordance with the social norms and cultural values which enable the society to establish goals, integrate elements, maintain its social structure, and adapt to change. The functional and dysfunctional contribution of accounting to the total societal system is viewed here in the context of whether it does or does not contribute to the means for meeting any of the social requirements and basic human needs of society. Thus, its sensitivity to a number of social norms and cultural values guiding the operation of the total society is vital.

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1 In general, these four are the basic requirements of a social system as originally expounded by Talcott Parsons and his associates. A brief statement of this view can be found in Talcott Parsons, The System of Modern Societies, Foundation of Modern Sociology Series (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1971), ch. 2.

In its scope, the inquiry views the field of accounting as not merely limited to the ostensible products of its practice, but as a field which coextends with all human action in its economic aspects.\(^1\) Accounting as a social discipline has a relevance only in the context of existing socioeconomic institutions. This context has its antecedents and causal conditions, and in those conditions the art and practice of accounting, as we know it, has developed. The institutional context of accounting also makes it imperative to consider that what may have been a valid practice in the past is no longer necessarily valid now because of changes in the institutional structure.\(^2\)

The accounting function of an accounts receivable system, for example, has a broad enough general objective to cut through a variety of social orders and prevail in all of them. Such a system in its detailed specifications as it existed in a pre-industrial world, however, where the institution of credit was insignificant, is entirely out of place in a post-industrial world where nearly every exchange transaction bears the imprint

\(^1\)Chambers has taken this view. See R. J. Chambers, "The Conditions of Research in Accounting," The Journal of Accountancy, 110 (December, 1960), 30. He has also noted elsewhere that in the pursuit of knowledge, there are no limited fields. There is simply the totality of things observed and experienced. "There can be no understanding of any aspect of human behavior, or of human behavior in any specific context, if we are forbidden to consider other aspects or contexts of human behavior." See Chambers, Accounting, Evaluation and Economic Behavior, p. 11.

\(^2\)Chambers, Accounting, Evaluation and Economic Behavior, p. 15.
of credit, and where the societies are moving fast toward cashless as well as checkless exchange relationships. Thus, there is no sense in which a theory may be developed which will be applicable to all environmental contexts through time. Every social order has its own distinctive context as well as style, both of which need authentic expression and which require instruments of expression uniquely faithful to that context and style.

This inquiry envisions an accounting purpose which should enable us to comprehend more fully the socioeconomic structure and tendencies of the organizations within the larger societal process and institutional context. To the extent that accounting provides us this comprehension, in whatever form or complexity, it has an undeniable social relevance. In fact, it becomes a survival imperative. This presupposes that this inquiry should examine the features of the institutional setting of the post-industrial society insofar as they provide the conditions for an accounting function appropriate to that setting.

\[1\] Ibid.

\[2\] Development of a theoretical structure only within the present institutional context has also been Chambers' major preoccupation in his ground-breaking work, where the "purpose is not to seek principles of universal validity in all institutional settings. . . . There may emerge some principles which we may deem to be valid in a much wider setting and over a range of different historical contexts. But this is incidental." Ibid. Moore also suggests that this institutional context is quite crucial in that it functions to integrate the isolated economic act or the particular economic organization into the fabric of the normative order of society. See Wilbert E. Moore, Economy and Society, Doubleday Studies in Sociology (Garden City, N. Y.):
Accounting as a profession represents a major business information system of the society. It is implicit in this representation that a set of relationships exist among the accounting profession, business world, and society which should be delineated and defined as clearly as possible. Otherwise, no acceptable criteria exist for reorienting the scope of accounting technology and expanding the area to which that technology should be applied if accounting is to adapt to the changing world or play any shaping role there.\(^1\) The Committee of the American Accounting Association to Prepare a Statement of Basic Accounting Theory thus seeks to encourage academic research directed toward the development of the future of accounting theory, as there is a need for a much broader conception of it than has been espoused in any authoritative accounting document.\(^2\) Bedford pleads the case for a systematic study toward these directions, like the present one, for two reasons:

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Doubleday & Company, Inc., 1955), p. 18. The institutional variables must be considered adequately in accounting theory construction and model building if a representative picture of the economic life is to be given. However, a common method--and an easy way out of the empirical complexity taken particularly by economists--is to assume that these variables do not change, that is, they are "given." See, for example, Paul A. Samuelson, Economics: An Introductory Analysis (2nd ed., New York: McGraw-Hill Book Company, 1951), p. 15.


First, without a systematic approach it is difficult to evaluate progress. Even if the "best" solution to the problem of the proper scope of the accounting function is proposed, it may not be recognized and accepted unless it is supported by a systematic study and analysis. Second, a systematic study will probably prove more productive, because of its comprehensiveness and the tendency to use scientific methods.¹

Almost fifty years ago Littleton suggested that accounting literature, if it was to grow properly, must in part result from research and inquiries in kindred fields of correlative material.² The heavy sociological orientation of this inquiry is an attempt to meet Littleton's challenge. To some extent it is also what Whitehead calls the adventure of ideas to break through the intellectual walls that have been built around us.³ Risks are always inherent in a venture such as this, but they are worth taking for the sake of the new possibilities that such a venture implies. For, as Chambers writes:


²A. C. Littleton, "The Development of Accounting Literature," in Publications of the American Association of the University Instructors in Accounting (n.p., American Association of the University Instructors in Accounting, 1925), p. 16. Chambers also advocates such a spacious vision and, in his inquiry, finds it necessary to use statements which may seem to belong to the fields of law, political science, psychology, economics, etc. He suggests that this necessity arises from the concern of accounting with some aspects of the behavior of men, individually or as members of groups; of men as active, or passive, or unwitting collaborators with others. "We will not therefore want to be constrained by such observations as, 'that is not accounting, it is economics' or by such assertions as, 'accountants are not concerned with psychology.'" See Chambers, Accounting, Evaluation and Economic Behavior, p. 11.

History forgets the unadventurous; it remembers the adventurous, and the history is changed by them. The questions confronting us today are whether we are going to isolate ourselves to the point where we become flabby, to use Hatfield's epithet, and open to destruction or whether from within we are to encourage and undertake adventure.¹

D. An Overview of Strategy

The inquiry has in its premise a basic proposition that a conceptual framework toward theory construction can be meaningfully provided only within the institutional context and setting. To provide such an institutional setting, this inquiry will first endeavor to examine the institutional phenomenon of modern technology and the consequent emergence of the post-industrial society and its organizations. Then, an attempt will be made to delineate and evaluate the information needs of such a society and its organizations, and what imperatives they provide for a relevant accounting function.

From the above, hopefully, a broad socioeconomic conceptual framework will emerge which will aid future scholars in their efforts to define the accounting function in a post-industrial society.² Attempts will be made here to deliberately seek new


²A conceptual framework as viewed here is neither a model nor a theory, but rather a conceptual scheme or a standpoint from which models can be generated or theories developed. It helps a theorist to select particular attributes from a complex reality and to group them under a common rubric in order to discern similarities and differences. As Bell puts it, it is neither true nor false but only useful or not. See Bell, "Post-Industrial
constructs that may open up a previously overlooked functional relationship between accounting and the larger societal processes.

The approach and evaluation of the phenomenon of technology will be delineated in two ways. First, technology is viewed as standing today at the very center of human perception. Its volatility, quality of finality, and the degree to which our modern life is oriented toward and dependent upon it—all this implies that we must make conscious and vigorous efforts to keep our conceptual framework up to the needs of our times. Secondly, technology is analyzed here in its institutional context. Viewed as an organization of knowledge for the achievement of human purposes, technology is defined in this inquiry as "human action on physical objects or as a set of physical objects characterized by serving human purposes." ¹

The inquiry will concern itself with the effects of technology in determining the nature of the socioeconomic order. In particular, it will attempt to examine and evaluate technological impact on the following significant aspects of the social structure:

1. Economic Sector: The shift from a goods-producing to a service economy
2. Occupational Slope: The predominance of the professional and technical class
3. Technology: The rise of a new intellectual technology

¹Drucker, Technology, Management & Society, p. 40.
(4) Pattern of Change: The self-sustaining technical growth

(5) Axial Principle: The centrality of theoretical knowledge

Analysis of the above aspects of the social structure coupled with ample empirical evidence suggesting definitive structural changes will provide the basic outline of the emergent post-industrial social design. A comparative analysis will be provided to delineate and distinguish post-industrial societies from pre-industrial and industrial societies.

To provide an institutional setting for post-industrial accounting, the inquiry will relate to the changes which modern technology has brought to the behavior of giant corporate organizations as socioeconomic entities of the post-industrial society. The basic issue here is: What happens when the new rationality, the proliferation of expertise, and the growing social importance of knowledge run head-on into socioeconomic structures, processes, attitudes, values, and practices that were developed in the hundred years between Andrew Jackson and World War II, that is, during a time when science and technology were not so big and powerful as they have become since, and when the socioeconomic role of knowledge and its institution were secondary at best or virtually nonexistent at worst?¹

¹Mesthene, Technological Change, p. 64. For example, when the United States entered World War I, and an offer of services from the American Chemical Society was made, it was turned down because the War Department already had a chemist. Further, there was no classification of "physicist" in the government. When the armed forces felt the need of one, which happened occasionally,
Technological impact on corporate organizations and other post-industrial institutions will be examined in the following two ways. First, has the increasing reliance on knowledge and information in organizational decision-making led to any basic changes in the distribution of power within an organization such as a corporation? What is the legitimacy of such a distribution of power? Secondly, the development and application of technology seem increasingly to require large-scale and complex social concentrations, whether these be cities, corporations, universities, or government. Inherent in the dynamics of technology is a constant impact toward centralization. The large organizations, particularly corporations, have emerged as an overwhelming social force. What are the implications of this development for the accounting function in a post-industrial society?

The inquiry will attempt to define a triangular relationship among the accounting function, the institutional aspect of our economic existence, and the post-industrial life in its totality. The inquiry's approach to the accounting function is total-systemic. It seeks to establish a closely-knit relationship between the accounting function and larger societal processes.

The purpose of the inquiry is to provide a conceptual framework which will help us select particular attributes from he was hired as a chemist. See James B. Conant, Modern Science and Modern Man, Doubleday Anchor Books (Garden City, N. Y.: Doubleday & Company, 1953), pp. 17-18.
the complex post-industrial reality. These attributes can be grouped under a common rubric in order to discern the post-industrial accounting function. As for the method of exposition, an attempt will be made to see that the inquiry does not create a world of its own choosing and exclusive understanding.\footnote{In fact, this has become a professional hazard in scholarly writing, where stuffed with obscure symbols attempts are usually made to look for something small in bulk. This results in what Wilson calls Talmudic Pilpul, the method of rabbinical exegesis by which the criterion of excellence comes to consist in the degree of farfetchedness that could be compassed by subtle argument. See Edmund Wilson, The Bit Between My Teeth: A Literary Chronicle of 1950-1965 (New York: Farrar, Straus and Giroux, 1965), pp. 364-402. Galbraith also has similarly criticized much of the professional writing in economics. See John Kenneth Galbraith, "The Language of Economics," Fortune, LXVI (December, 1962), 128; and Galbraith, The New Industrial State, pp. 407-418. From the radical side, too, there are similarly critical remarks. See Paul M. Sweezy, "Toward a Critique of Economics," Review of Radical Political Economics, III (July, 1971), 59-60. With particular reference to accounting, Robert K. Mautz severely condemned much of its current professional writing as hallucinatory in his unpublished Opening Remarks at the American Accounting Association Sponsored Doctoral Consortium held at Lexington, Kentucky, August 18, 1971.}

\section*{B. A Retreat from Theory\footnote{The following sources have been particularly useful in the development of this section: Sterling, "Introduction," pp. 401-406; Kuhn, The Structure of Scientific Revolutions, pp. 23-51; and Kaplan, The Conduct of Inquiry, pp. 330-340. Many of the references cited here were first found in these writings and later traced to their original sources for further research.}}

One cannot judge the appropriateness of a research method without placing it in the context of the research question that is being explored.\footnote{Sterling, "Introduction," p. 402.} In the post-industrial society, we are facing
a new and puzzling kind of social change that forces a phenomenon upon us which Bell calls "the retreat from theory," if by theory one means a model of "social structure which specifies the determinate interaction of the crucial variables of a system, establishes empirical regularities which predict future states of relation and provides an explanatory principle of its history and operation."¹

We are forced back to creating new paradigms, in the sense that Kuhn has used the term: conceptual schemes, which themselves are neither models nor theories but standpoints from which models can be generated and theories developed.² This is particularly

¹Bell, "Post-Industrial Society," p. 158.
²Ibid. Kuhn most emphatically suggests that the priority of such a paradigm provides the scientists with a criterion for choosing problems that can be assumed to have solutions. They can agree in their identification of a paradigm without agreeing on, or even attempting to produce, a full interpretation or rationalization of it. Lack of a standard interpretation or of an agreed reduction to rules will not prevent a paradigm from guiding research. Normal science can be determined in part by the direct inspection of the paradigms, a process that is often aided by but does not depend upon the formulation of rules and assumptions. Indeed, as Kuhn says, the existence of a paradigm need not even imply that any full set of rules exists. Thus, paradigms may be prior to, more binding, and more complete than any set of rules for research that could be unequivocally abstracted from them. Consequently, paradigms could determine normal science without the intervention of discoverable rules. See Kuhn, The Structure of Scientific Revolutions, pp. 35-51, 175-182. Also, see Michael Polanyi, Personal Knowledge: Toward a Post-Critical Philosophy (New York: Harper & Row, Publishers, 1964), chs. v and vi; and The Tacit Dimension (Garden City, N. J.: Doubleday & Co., Inc., 1966). For a short but brilliant statement on the same subject, articulating Polanyi's lifelong work, see his "Genius in Science," Encounter, January, 1972, pp. 43-50. It should be noted here that Kuhn's notion of "paradigm," though most celebrated, is also a much maligned and abused term. By one count it has twenty-three different meanings. For our purpose, however, the notion of "paradigm" is taken in the sense of an exemplar—the specific,
important in accounting, which is currently in a state of flux and does not have the paradigm necessary for it to be classified as a normal science in which only puzzle-solving is needed.\(^1\)

Thus, today perhaps more than at any other time in the history of accounting, we are in need of theoretical concepts which can provide the basis for a logical, consistent, and articulated set of accounting practices.\(^2\) The present inquiry will attempt to incorporate such concepts in a framework which will, hopefully, provide a basis for the post-industrial accounting function.

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\(^1\)Sterling, "Introduction," p. 405. As Kuhn writes, the puzzles are that special category of problem that can serve to test ingenuity or skill in solution. In a normal science, as we already have paradigms, not the intrinsic value but the assured existence of the solution is the criterion. See Kuhn, The Structure of Scientific Revolutions, pp. 30-37. Also, see Polanyi, "Genius in Science," pp. 40-47.

\(^2\)Edwin H. Caplan, "Accounting Research as an Information Source for Theory Construction," Report of the Committee on Research Methodology in Accounting, Sterling, chairman, p. 438. For developing a relevant analytical framework, Leon and Heilbroner also talk about the need for new constructs, particularly those having to do with the development of technology. See Pablo Leon, Structural Change and Growth of Capitalism; A Set of Hypotheses, trans. and rev. by the author (Baltimore: Johns Hopkins Press, 1967); and Robert L. Heilbroner, "On the Limits of Economic Prediction," Diogenes, Summer, 1970, p. 39. In economics, as Samuelson suggests, it makes a tremendous difference whether or not a new paradigm has been found that gives the economists a coherent way of thinking about previously known facts. He thinks that such a new paradigm was provided in the thirties by the monopolistic-competition revolution in economic theory. See Paul A. Samuelson, "Liberalism at Bay," Social
F. Utility of Concepts

In a conceptual scheme one groups together diverse attributes or properties of an object or experience, in a higher order of abstraction, to relate with or distinguish them from other objects or experiences. It is common if not normal for a theory to be formulated in terms of types of ideal concepts which for the most part are not descriptive of anything experimentally observable. There is, nevertheless, a rationale for using them in theory construction, because they help to place theory in a relatively simple and clearer formulation.

The simplicity and clarity of these concepts undoubtedly enter into the formulation of theories. Weber argued that the major goal of social science was to achieve clarity concerning

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Research, XXXIX (Spring, 1972), 19. However, with a reminder that the function of a scientific paradigm is to provide a framework for normal science, Solow fears that there is often a danger that some might corrupt Kuhn's notion and take it as mere license for a lot of loose thinking. He charges that the radical economists have done just that in economics. See Robert M. Solow, "The State of Economics," The American Economic Review, Papers and Proceedings, LXI (May, 1971), 63-64. For an interesting discussion on how a paradigm makes all the difference in interpreting the socioeconomic realities as viewed through the conventional vs. radical economics, see John G. Gurley, "The State of Political Economics," ibid., pp. 53-62.


the situations in which men select and act on their values—
clarity that helps the individual "to give himself an account
of the ultimate meaning of his own conduct."¹

G. Models of Explanation

To formulate a conceptual scheme that attempts to achieve
the objectives of simplicity and clarity, this inquiry will use
two accounts of reasons which provide understanding and thereby
explanation. Kaplan calls them the "pattern model of explanation"
and the "deductive model." In these models, roughly, we know the
reason for something either when we can fit it into a known
pattern, or when we can deduce it from other known truths. Both
models are overlapping. From the nature of the whole pattern and
some of its parts we can deduce the others. Conversely, a deduc-
tive relationship might itself be viewed as constituting a cogni-
tive pattern. Thus, these two models may serve a useful purpose
in methodology because they provide two different reconstructions
of explanation.²

In a pattern model something is explained when it is so
related to a set of other elements that together they constitute
a unified system. Understanding of the pattern model is total-

¹Max Weber, From Max Weber: Essays in Sociology, trans.,
ed., and with an Introduction by H. H. Gerth and C. Wright Mills

²Kaplan, The Conduct of Inquiry, p. 332.
a specific part in an organized whole. It is a matter of perception of relationships. The unknown is identified with something known, though not by way of its local properties but in terms of its place in a network of relations.

In a deductive model of explanation, an event is explained by subsuming it under general laws, i.e., by showing that it occurred in accordance with those laws by virtue of the realization of certain specified antecedent conditions. The explanation of a general regularity consists in subsuming it under another, more comprehensive, regularity under a more general law. That is, the deductive explanation shows that on the basis of what we already know, something could not be otherwise. Whatever provides this element of necessity serves as an explanation. The great power of the deductive model consists in the clear and simple way in which the necessity is accounted for.

It is hoped that what will emerge here is what Leontief calls the pragmatic teleological rather than the deterministic explanation of social phenomena. Only with this kind of explanation can any advance in our understanding of socioeconomic reality.

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1Ibid. This process of explanation borders upon interpretation, which Walsh calls "colligation." Here a succession of events are seen not as a bare sequence, but as a configuration made meaningful by connections. An event is explained by tracing its intrinsic relations to other events and locating it in its systemic context. See W. H. Walsh, Introduction to Philosophy of History (London: Hutchinson's University Library, 1951), p. 59.


be visualized as a gradual tightening of the explanatory scheme. The introduction of new, previously unknown relationships among the variables reduces, step-by-step, the range of indeterminacy that characterizes all knowledge. Each additional bit of information about the societal structures and processes might add to our knowledge of what can and cannot be accomplished.\(^1\)

H. A Leap of Faith

These are merely points of departure, and, of course, are not to be taken as definitive methods of this inquiry. To do so would be to violate the basic tenet of science. The canons of inquiry are themselves discovered in the process of reflection, and may themselves become modified in the course of a study.\(^2\)

To the extent that this inquiry and its methods may seem a bit alien, we refer to the following observation by Sterling, which

\(^1\)Wassily Leontief, "The Limits of Economics," review of Between Capitalism and Socialism: Essays in Political Economics, by Robert L., Heilbroner, in The New York Review of Books, July 29, 1972, pp. 30-33. Leontief further suggests that classical economics and, to some extent, neoclassical economics have been guided by the deterministic explanation where the functioning of the economic system as a whole is explained by analyzing a blind mechanical interaction of households, business, trade unions, and governmental organizations, all trying to maximize their interests. Ibid. One example of such a deterministic explanation is what Samuelson said in his Nobel Prize address. He suggested that not only the actions of consumers and producers but even the behavior of Newton's falling apple could be interpreted as if they were solutions to the appropriately formulated maximizing or minimizing problem. See Paul A. Samuelson, "Maximum Principles in Analytical Economics," The American Economic Review, LXII (June, 1972), 249-255.

is noteworthy for its spacious vision:

Since the research methods depend upon the questions and since I am unwilling to place restrictions on questions, it follows that I am unwilling to place restrictions on methods. I conclude therefore, that all of the research methods from all of these other disciplines are appropriate for accounting. To put it another way, the goal of research is to obtain results which will contribute to our knowledge. The danger of excluding a research method is that, in so doing, we will be excluding some research results which may contribute to our knowledge. To avoid this danger, I am unwilling to exclude any research methods, and therefore, I must include all research methods.¹

Earlier it was stated that to some extent this inquiry is an adventure of ideas. Such adventures do not always provide satisfactory answers; they may not even provide any answers. Consequently, as Polanyi puts it so well, a scientific discovery requires the jumping of a "logical gap" and one can never be sure of his ability to make the jump until he has tried.² Thus, the


²Polanyi, Personal Knowledge, p. 123. Polanyi consistently deals with the same theme in many of his writings. For instance, elsewhere he writes:

In accepting the task of pursuing a problem, the scientist assumes it to be a good problem: a problem that he can solve by his own gifts and equipment and that is worth undertaking in comparison with other available possibilities. He must estimate this; and such estimates are guesses. But such guesses have proved sufficiently good to secure the progress of scientific enquiry with a reasonable degree of efficiency. It is rare to come across years of futile efforts wasted, or else to find that major opportunities were patently missed. Indeed, the opportunities for discovery are so effectively exploited that the same discovery is often made simultaneously by two or three different scientists. There is no doubt, therefore, of the scientist's capacity to assess in outline the course of an enquiry that will lead to a
selection of a research question requires a leap of faith. Indeed, we cannot know that we will be able to obtain an answer until after the research has been performed. Thus, "one must address a research question because he believes that he can obtain an answer and that the answer is likely to be important."  

result which, at the time he makes his assessment, is essentially indeterminate.

See Polanyi, "Genius in Science," p. 44.

Sterling, "Introduction," p. 402. There is always a possibility of serendipity. Merton has emphasized this idea particularly in relation to social sciences. Serendipity refers to the happy circumstance in research of finding valuable or agreeable things that were not sought for in the course one originally laid out. See Robert K. Merton, "Singletons and Multiples in Scientific Discovery: A Chapter in Sociology of Science," Proceedings of the American Philosophical Society, CV (October, 1961), 470-486. See also Daniel Bell, "The Year 2000--The Trajectory of an Idea," in Toward the Year 2000: Work in Progress, ed. by Daniel Bell (Boston: Beacon Press, 1969), p. 4. Also, Kuhn warns against expecting much novelty in research results. He notes that the most striking feature of normal research problems is how little they aim to produce major novelties, conceptual or phenomenal. Even the project whose goal is paradigm articulation does not aim at the unexpected novelty. See Kuhn, The Structure of Scientific Revolutions, p. 35.
III. THE POST-INDUSTRIAL SOCIETY: AN OVERVIEW

A. Concept

The concept of the post-industrial society deals primarily with the long-run structural changes in the society. As a conceptual scheme, it is the selection of particular attributes from a complex reality and their grouping under a common rubric in order to discern similarities and differences. The terms feudalism or capitalism are a sequence of conceptual schemes in the Marxist framework along the axis of property relations. Likewise, the terms pre-industrial, industrial, and post-industrial are in a conceptual sequence along the axis of production and the kinds of knowledge utilized. Dwelling on an axis, we can highlight the similarities or differences among these stages.²

¹The following sources have been particularly useful in developing this and the next chapter: "Post-Industrial Society--A Symposium," participated in by Daniel Bell, Jean Floud, Peter Wiles, Francois Bourricaud, Giovanni Sartori, and Ken'chi Tominaga, and available in Survey, XVI (Winter, 1971), 1-77; Daniel Bell, "The Post-Industrial Society," pp. 102-108; Daniel Bell, "Notes on the Post-Industrial Society (I)," The Public Interest, Winter, 1967, pp. 24-35; Daniel Bell, "Notes on the Post-Industrial Society (II)," The Public Interest, Spring, 1967, pp. 102-118; and Daniel Bell, "The Measurement of Knowledge and Technology," in Indicators of Social Change: Concepts and Measurements, ed. by Eleanor Bernert Shelden and Wilbert E. Moore (New York: Russell Sage Foundation, 1968), pp. 145-240. Many of the references throughout this inquiry were first found in Bell's above works and then later traced to their original sources for further research.

²Bell, "The Post-Industrial Society," pp. 158-165. Further, the concept of the post-industrial society as it is used here is more of an explanatory key which can be applied both in retrospection and forecasting. In this perspective, Communism can be seen not as a "next" stage in history as Communists usually argue, but simply as one of a number of alternative modes
B. Theoretical Knowledge: The Chief Ganglion

In the post-industrial society, the economy has moved from being predominantly engaged in the production of goods to a preoccupation with services, research, education, and amenities. The professional-technical class has become the major occupational group. Most significantly, innovation in society---as reflected in the changing relationship of science to technology, and economics to polity---is a survival imperative. In such a society, knowledge, particularly theoretical knowledge, is central, for modern innovations are always dependent upon advances in this kind of knowledge--systematic, purposeful, and organized.¹

In the post-industrial society most individuals are generally freed from industrial production. Instead of working on assembly lines and at other kinds of pre-industrial and industrial tasks, they do work which relies heavily on special knowledge and skill, either in creating or manning production facilities or in working with human beings. Thus, if the hand-mill was central to

of industrialization. In the Communist nations, industrial societies are created by specifically political, rather than market, models. In societal explanations, differences do arise because a variety of scholars use a variety of deciphering keys and explanatory searchlights. However, all of them do need an explanatory key before anything else. That is what has been attempted in the concept of the post-industrial society. See Giovanni Sartori, "Technological Forecasting and Politics," Survey, XVI (Winter, 1971), 60; and Bell, "The Post-Industrial Society," p. 123.

¹This theme about the centrality of knowledge has been reiterated by many. For example, see Erzegiński, Between Two Ages, Pt. I; Bell, "The Post-Industrial Society," pp. 158-165; Boulding, Beyond Economics, pp. 158-175; and Peter F. Drucker, The Age of Discontinuity: Guidelines to Our Changing Society (New York: Harper & Row, Publishers, 1969), pp. 38-41.
the feudal society, and the steam-mill to the industrial society, to use the Marxian paradigm, theoretical knowledge is central to the post-industrial society.

Table 1 is an effort to compute the proportion of the gross national product devoted to the production and distribution of knowledge. It is estimated that in 1958 about 29 per cent of the existing gross national product, or $136,430 million, was spent for knowledge.\(^1\) Of course, knowledge is at the basis of every society, but in the post-industrial society, what is crucial is not just a shift from property or politics to knowledge as a new base of power, but rather a change in the character of knowledge itself.\(^2\)

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\(^2\)Bell, "Notes on the Post-Industrial Society (II)," p. 28. Bell further asserts that this is indeed the novelty of the future society. No society hitherto has had this functional imperative of knowledge. The point emerges most obviously from a comparison of the style of scientific invention of the nineteenth and early twentieth centuries which was led by men who were, as Bell says, inspired and talented thinkers. Their technological activity, in spite of its tremendous success, was still in its structure what it had been through the ages: a craft. It was practiced by individuals usually working alone and without much formal education. By the middle of the twentieth century the technological activity has become thoroughly professional, based on specific university training, as a rule. Its thorough specialization requires that it be carried out in special institutions, such as research laboratories, which are governed by programs of research systematically exploring a range of probable consequences of some particular advance in the understanding of the laws governing the behavior of the physical world. When one thinks of the problems of managing a research and development program with an annual expenditure of several million dollars in modern corporations, one begins to have some sense of the "primacy" of theory. See Andrew Shonfield, "Thinking About the Future,"
<table>
<thead>
<tr>
<th>Type of knowledge and source of expenditures</th>
<th>Amount in millions of dollars</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>60,194</td>
<td>44.1</td>
</tr>
<tr>
<td>Research and development</td>
<td>10,990</td>
<td>8.1</td>
</tr>
<tr>
<td>Communication media</td>
<td>38,369</td>
<td>28.1</td>
</tr>
<tr>
<td>Information machines</td>
<td>8,922</td>
<td>6.5</td>
</tr>
<tr>
<td>Information services (incomplete)</td>
<td>17,961</td>
<td>13.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>136,436</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Expenditures made by:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>37,968</td>
<td>27.8</td>
</tr>
<tr>
<td>Business</td>
<td>42,198</td>
<td>30.9</td>
</tr>
<tr>
<td>Consumers</td>
<td>56,270</td>
<td>41.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>136,436</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

C. The University: The Primary Institution

The pivotal nature of theoretical knowledge in the post-industrial society makes it inevitable that among all the intellectual institutions of society, the university should become its primary institution. It is in the university, more than anywhere else, where theoretical knowledge is sought, tested, and codified in a disinterested fashion. Just as the business firm was the key institution of the past one hundred years because of its role in the organization of mass-production, the university will have to become the central institution of the next one hundred years because of its role as the new source of innovation and knowledge.

Planned by the components of the system of higher education, at least in American society, the university has already become the focal center of the research function. Moreover, as the university professional schools are now the primary locus for the training of members of the applied professions, the university has also become the center of a professional complex where the relations between pure intellectual disciplines intersect with the fields of their application in practice.¹

By providing the most expert scientific and academic advice, the university has become the creative eye of the massive communication complex, and the source of much domestic and

¹Talcott Parsons, "Research with Human Subjects and the Professional Complex," Daedalus, XCVIII (Spring, 1969), 330-335.
international planning.\footnote{1} Tables 2 to 5 portray the emergence of university-based higher education in America as an emergent post-industrial force, and also provide a comparative look at other countries of the world.

D. Technocrats: The Dominant Class

To say that the major institutions of the new society will be intellectual is to assume that the production and business decisions will be subordinated to, or will derive from, other forces in society. The crucial decisions regarding the growth of the economy and its balance will come from the government. They will be based on the government's sponsorship of research and development, as seen in Table 6.\footnote{2}

\footnote{1}Brzezinski, "The American Transition," p. 20.

\footnote{2}Regarding governmental sponsorship of research and development, it should be noted that such an undertaking is a matter of deliberate policy. For example, while explaining the fiscal year 1972 research and development budget, the President's Science Adviser emphasized that research and development was a high priority item, and that the government was determined to maintain and widen American preeminence in basic research. Further, he suggested that the government must sustain colleges and universities so that they can continue to provide excellent manpower. See Carl Kaysen, "Government and Scientific Research--Some Unanswered Questions," The Public Interest, Summer, 1971, p. 80. In the state-underwriting of the enormous costs of research and development, Galbraith sees the socialization of private corporate costs. This fits well into his vision of "the new industrial state" where education--especially education that is intended to increase the supply of specialists needed by the modern corporation--becomes a state responsibility. The major technological breakthroughs, especially those that have to do with space exploration and ament, may also be assigned to the state, their cost being assumed by the citizens. See Galbraith, The New Industrial State, p. 309. Also, see Andreas G. Papandreou, Man's Freedom (New York: Columbia University Press, 1970), pp. 43-44.
### TABLE 2

**Earned Degrees Confected by the Institutions of Higher Education, 1869-1870 to 1963-1964**

<table>
<thead>
<tr>
<th>Year</th>
<th>All degrees</th>
<th>Baccalaureates and first professional</th>
<th>Master's except first professional</th>
<th>Doctorates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1869-70</td>
<td>9,372</td>
<td>9,371</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1879-80</td>
<td>13,829</td>
<td>12,890</td>
<td>879</td>
<td>54</td>
</tr>
<tr>
<td>1889-90</td>
<td>10,703</td>
<td>15,539</td>
<td>1,015</td>
<td>149</td>
</tr>
<tr>
<td>1899-1900</td>
<td>29,375</td>
<td>27,410</td>
<td>1,583</td>
<td>382</td>
</tr>
<tr>
<td>1909-10</td>
<td>39,755</td>
<td>37,113</td>
<td>2,113</td>
<td>443</td>
</tr>
<tr>
<td>1919-20</td>
<td>53,516</td>
<td>48,622</td>
<td>4,279</td>
<td>615</td>
</tr>
<tr>
<td>1929-30</td>
<td>139,752</td>
<td>122,484</td>
<td>14,969</td>
<td>2,299</td>
</tr>
<tr>
<td>1939-40</td>
<td>216,521</td>
<td>186,500</td>
<td>26,731</td>
<td>3,290</td>
</tr>
<tr>
<td>1941-42</td>
<td>213,491</td>
<td>185,346</td>
<td>24,048</td>
<td>3,497</td>
</tr>
<tr>
<td>1943-44</td>
<td>141,582</td>
<td>125,863</td>
<td>13,414</td>
<td>2,305</td>
</tr>
<tr>
<td>1945-46</td>
<td>157,349</td>
<td>130,174</td>
<td>19,209</td>
<td>1,966</td>
</tr>
<tr>
<td>1947-48</td>
<td>317,607</td>
<td>271,019</td>
<td>42,400</td>
<td>4,188</td>
</tr>
<tr>
<td>1949-50</td>
<td>490,661</td>
<td>432,058</td>
<td>58,183</td>
<td>6,420</td>
</tr>
<tr>
<td>1951-52</td>
<td>401,203</td>
<td>329,986</td>
<td>63,534</td>
<td>7,683</td>
</tr>
<tr>
<td>1953-54</td>
<td>356,608</td>
<td>290,825</td>
<td>56,788</td>
<td>8,995</td>
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<tr>
<td>1955-56</td>
<td>370,973</td>
<td>308,812</td>
<td>59,258</td>
<td>8,903</td>
</tr>
<tr>
<td>1957-58</td>
<td>436,979</td>
<td>362,354</td>
<td>65,487</td>
<td>8,938</td>
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<tr>
<td>1959-60</td>
<td>470,704</td>
<td>392,440</td>
<td>74,435</td>
<td>9,829</td>
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<tr>
<td>1961-62</td>
<td>514,323</td>
<td>417,846</td>
<td>84,855</td>
<td>11,622</td>
</tr>
<tr>
<td>1963-64</td>
<td>614,194</td>
<td>498,654</td>
<td>101,050</td>
<td>14,490</td>
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</table>

**Note:** Beginning in 1959-60, includes Alaska and Hawaii.

### TABLE 3

**LEVEL OF EDUCATION**

(by percentage)

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<thead>
<tr>
<th></th>
<th>1901</th>
<th>1961</th>
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<tr>
<td><strong>Prop. of persons</strong></td>
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<td></td>
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<tr>
<td>with university</td>
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<td></td>
</tr>
<tr>
<td>or college education</td>
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<tr>
<td>in the economically</td>
<td></td>
<td></td>
</tr>
<tr>
<td>active population</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prop. of persons</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with secondary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>education in the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>economically</td>
<td></td>
<td></td>
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<tr>
<td>active population</td>
<td></td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>1901</th>
<th>1961</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czecho-Slovakia</td>
<td>2.00</td>
<td>13.50</td>
</tr>
<tr>
<td>USSR</td>
<td>4.05</td>
<td>18.32</td>
</tr>
<tr>
<td>USA</td>
<td>8.89</td>
<td>30.39</td>
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<tr>
<td>Great Britain</td>
<td>4.43</td>
<td>16.44</td>
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<tr>
<td>Canada</td>
<td>4.27</td>
<td>22.04</td>
</tr>
<tr>
<td>Federal Republic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of Germany</td>
<td>3.82</td>
<td>---</td>
</tr>
<tr>
<td>Japan</td>
<td>3.48</td>
<td>25.95</td>
</tr>
<tr>
<td>France</td>
<td>2.58</td>
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</tr>
<tr>
<td>Norway</td>
<td>2.58</td>
<td>10.84</td>
</tr>
<tr>
<td>Sweden</td>
<td>2.06</td>
<td>20.02</td>
</tr>
</tbody>
</table>

*a* With incomplete secondary education 23.82

*b* Excluding general education

*c* Year 1960

*d* Microcensus of the FRG

---

<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>1934</td>
<td>1939</td>
<td>1944</td>
<td>1949</td>
<td>1955</td>
<td>1959</td>
<td>1964</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>----</td>
<td>174a</td>
<td>408b</td>
<td>580c</td>
<td>509</td>
<td>590</td>
<td>886d</td>
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<tr>
<td>Czechoslovakia</td>
<td>201</td>
<td>182d</td>
<td>----</td>
<td>450</td>
<td>450</td>
<td>593</td>
<td>877</td>
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<tr>
<td>France</td>
<td>201</td>
<td>172</td>
<td>237</td>
<td>319</td>
<td>348</td>
<td>409</td>
<td>785d</td>
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<tr>
<td>Japan</td>
<td>260</td>
<td>263</td>
<td>410</td>
<td>539</td>
<td>549</td>
<td>687</td>
<td>863d</td>
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<tr>
<td>Yugoslavia</td>
<td>109</td>
<td>106g</td>
<td>----</td>
<td>349</td>
<td>355</td>
<td>472</td>
<td>832d</td>
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<td>Canada</td>
<td>318</td>
<td>319</td>
<td>311</td>
<td>594</td>
<td>493</td>
<td>537</td>
<td>934h</td>
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<tr>
<td>Hungary</td>
<td>104</td>
<td>138</td>
<td>----</td>
<td>249</td>
<td>350</td>
<td>269</td>
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<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
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</tr>
<tr>
<td>FRG</td>
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<td>----</td>
<td>----</td>
<td>----</td>
<td>4180f</td>
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<tr>
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<td>177</td>
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<td>154</td>
<td>256</td>
<td>184</td>
<td>192</td>
<td>327d</td>
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<tr>
<td>Poland</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>380</td>
<td>538</td>
<td>571</td>
<td>688d</td>
</tr>
<tr>
<td>Austria</td>
<td>331</td>
<td>214</td>
<td>158</td>
<td>416</td>
<td>281</td>
<td>366</td>
<td>627d</td>
</tr>
<tr>
<td>Rumania</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>304c</td>
<td>414</td>
<td>417</td>
<td>548d</td>
</tr>
<tr>
<td>USSR</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Sweden</td>
<td>166</td>
<td>183</td>
<td>188</td>
<td>215</td>
<td>205</td>
<td>384</td>
<td>654d</td>
</tr>
<tr>
<td>Switzerland</td>
<td>238</td>
<td>261</td>
<td>320</td>
<td>377</td>
<td>329</td>
<td>345</td>
<td>467d</td>
</tr>
<tr>
<td>USA</td>
<td>884k</td>
<td>1046</td>
<td>947l</td>
<td>1608n</td>
<td>1617o</td>
<td>1738p</td>
<td>2264q</td>
</tr>
</tbody>
</table>

*Source: Richts, Civilization at the Crossroads, p. 333.*
### TABLE 5

**SHARE OF STUDENTS ENROLLED IN THE FIRST YEAR OF STUDY AT UNIVERSITIES AND COLLEGES IN THEIR GIVEN AGE GROUP**

(by percentage)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>24.0</td>
<td>34.0</td>
<td>38.2</td>
<td>35</td>
<td>46</td>
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<tr>
<td>Canada</td>
<td>9.0</td>
<td>16.9</td>
<td>23.1</td>
<td>24</td>
<td>---</td>
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<tr>
<td>New Zealand</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>15</td>
<td>24</td>
</tr>
<tr>
<td>Great Britain</td>
<td>3.4</td>
<td>---</td>
<td>---</td>
<td>12.4</td>
<td>17</td>
</tr>
<tr>
<td>France</td>
<td>4.6</td>
<td>12.2</td>
<td>13.9</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Sweden</td>
<td>4.0</td>
<td>9.1</td>
<td>11.7</td>
<td>11</td>
<td>18</td>
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<tr>
<td>Italy</td>
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<td>10.0</td>
<td>12.5</td>
<td>---</td>
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<td>Belgium</td>
<td>3.3</td>
<td>7.4</td>
<td>8.9</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Denmark</td>
<td>3.3</td>
<td>5.1</td>
<td>8.9</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>FRG</td>
<td>---</td>
<td>7.3</td>
<td>7.8</td>
<td>6</td>
<td>---</td>
</tr>
<tr>
<td>Czechoslovakia</td>
<td>---</td>
<td>9.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9.9</td>
<td>---</td>
<td>14</td>
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</tbody>
</table>

<sup>a</sup>Average for the years 1963-1965

<table>
<thead>
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<th>Field of science</th>
<th>Actual 1966</th>
<th>Estimates 1967</th>
<th>Estimates 1968</th>
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<tbody>
<tr>
<td></td>
<td>(millions of dollars)</td>
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<tr>
<td>Total</td>
<td>$5,271</td>
<td>$5,023</td>
<td>$6,390</td>
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<td>Life sciences</td>
<td>1,290</td>
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<td>1,584</td>
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<tr>
<td>Medical sciences</td>
<td>811</td>
<td>909</td>
<td>1,020</td>
</tr>
<tr>
<td>Biological sciences</td>
<td>370</td>
<td>406</td>
<td>441</td>
</tr>
<tr>
<td>Agricultural sciences</td>
<td>109</td>
<td>116</td>
<td>124</td>
</tr>
<tr>
<td>Psychological sciences</td>
<td>100</td>
<td>107</td>
<td>124</td>
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<tr>
<td>Physical sciences</td>
<td>3,641</td>
<td>3,817</td>
<td>4,382</td>
</tr>
<tr>
<td>Physical sciences proper</td>
<td>1,842</td>
<td>1,852</td>
<td>2,040</td>
</tr>
<tr>
<td>Engineering sciences</td>
<td>1,877</td>
<td>1,840</td>
<td>2,205</td>
</tr>
<tr>
<td>Mathematical sciences</td>
<td>123</td>
<td>124</td>
<td>137</td>
</tr>
<tr>
<td>Social sciences</td>
<td>166</td>
<td>178</td>
<td>209</td>
</tr>
<tr>
<td>Other sciences</td>
<td>74</td>
<td>90</td>
<td>91</td>
</tr>
</tbody>
</table>

Note: Detail may not add to totals because of rounding of figures.

The husbanding of talent and the spread of educational and intellectual institutions will become a prime concern for the society. Not only the best talent, but also the entire complex of social prestige and status eventually will be rooted in the intellectual and scientific communities. The key to successful adaptation to the new conditions of the post-industrial societies lies in the effective selection, distribution, and utilization of social talent. If the industrial society can be said to have developed through a struggle for the survival of the fittest, the post-industrial society—in order to prosper—requires the effective mobilization of the ablest.\(^1\)

The post-industrial society presupposes the rise of a new class which, on the political level, serves as advisers, experts, and technocrats. The technologist occupies a hero's niche in this society, in the same manner that the businessman and soldier were heroes in other times.\(^2\) This is evidenced in Table 7. Today, 


\(^2\)Regarding the centrality of the businessman in America, Chandler writes that seemingly from the beginning they, more than any other group in the economy, have managed production, transportation, and the distribution of goods and services. Further, no other group has ever had much to do with the overall coordination of the economic system or its adaptation to basic changes in population and technology. In fact, they have run the economy exclusively. Consequently, they rose to the top of American society—not only in the sense that wealth gave them confidence that they were on top, but also in the sense that the citizenry accorded them the highest honor available in a democracy, election to principal public offices. Thus, this phase of the American society which is gradually drawing to a close now may be called a "business civilization," even though the majority of individuals in such a society are not businessmen. See Alfred D. Chandler, Jr., "The Role of Business in the United States: A Historical
TABLE 7

STATUS OF SCIENCE AND EDUCATION
IN OCCUPATIONAL STRUCTURE

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of investigated occupations</th>
<th>Rank in order of prestige</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czechoslovakia</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>FRG</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Czechoslovakia</th>
<th>Poland</th>
<th>United Kingdom</th>
<th>USA</th>
<th>FRG</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>University professor</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>7</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Scientist</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Engineer-technician</td>
<td>4</td>
<td>4</td>
<td>-</td>
<td>23</td>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td>Teacher</td>
<td>6</td>
<td>3</td>
<td>10</td>
<td>36</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Judge, lawyer</td>
<td>14</td>
<td>6</td>
<td>3</td>
<td>12</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Architect</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>15</td>
<td>-</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: Richta, Civilization at the Crossroads, p. 314.
the Nobel laureates, National Academy members, and scientist-
administrators, all possess prestige that makes front-page news
and carries them to the highest councils of the government and
society.\(^1\) This seems like the return of technocracy--the politi-
cal system in which the determining influence belongs to the
technician of administration and economy, the man who exercises
authority by virtue of his technical competence.\(^2\)

The technocrat, who as a specialized expert becomes in-
volved in special government undertakings, or who as a generalist-
integrator provides an ideological integration for disparate
actions, is a far cry from the largely humanist-oriented, occa-
sionally ideological-minded intellectual dissenter who saw his
role largely in terms of proffering social critiques. The modern

Survey," Daedalus, XCVIII (Winter, 1969), 23-40; William Letwin,
"The Past and Future of American Businessmen," Daedalus, XCVIII
(Winter, 1969), 1-22; and Daniel Bell, "Technocracy and Politics,"

\(^1\)Nisbet, "The Impact of Technology on Ethical Decision-
Making," p. 40. In this regard, it should be noted that in the
long run it is not the growth of personal power and prestige that
is important, but the institutionalization of social control and
functions, such as those carried out by the intellectuals in the
Bureau of Budget, Council of Economic Advisers, and Office of the
Science Adviser. This reinforces the structural shifts of power.

\(^2\)The word "technocracy," interpreted as above, was origi-
nally coined in 1919 by William Henry Smith. It went through
several interpretations in the writings of Howard Scott, Thorstein
Veblen, and others. For an interesting history of the term, see
J. George Frederick, ed., For and Against Technocracy: A Sympo-
sium (New York: Business Bourse, 1933); Bell, "Technocracy and
Politics," pp. 6-12; and Thorstein Veblen, The Engineers and the
Price System, A Harbinger Book (New York: Harcourt, Brace and
technocrats are more like a community of organization-oriented, application-minded intellectuals who relate themselves more effectively to the political system, thereby introducing into the political system concerns broader than those likely to be generated by the system itself, and perhaps more relevant than those articulated by outside critics. ¹

IV. POST-INDUSTRIALISM: AN ANALYSIS OF THE CONCEPT

A. The Axial Principle and Social Design

The concept of post-industrialism identifies a new axial principle of the organization of knowledge, and defines a common core of problems which the post-industrial societies confront. It is an effort to identify a change in social structure. In an historical sense, however, the post-industrial society is a continuation of trends unfolding out of the industrial society. Many of the developments were indeed foreseen long ago.

Yet, for analytical purposes, one can divide societies into pre-industrial, industrial, and post-industrial in order to see them in contrast along many different dimensions. 1 Tables

---

1It is true that the term post-industrial presupposes the trichotomy of "pre-industrial," "industrial," and "post-industrial," and that, as Tominaga has pointed out, the boundary between industrial and post-industrial does not constitute a real break, as it does between pre-industrial and industrial. The post-industrial may seem to lie within the continuous process of industrialization. Thus, to some it is not a stage resembling the distinction between pre-industrial and industrial, but a phase within the industrial stage of society. Throughout the entire process of industrialization, including the post-industrial stage, the development of science and technology has consistently played the part of the prime mover. The increasing preponderance of the knowledge industry in the post-industrial society is merely the end result of this process. For an extension of this argument, see Ken'ichi Tominaga, "Post-Industrial Society and Cultural Diversity," Survey, XVI (Winter, 1971), 69-77. Also, having gone through the concept of the post-industrial society, it is frustrating to discover that the concept is simply an amalgamation of what St. Simon, Tocqueville, Weber, and Marx have already furnished to us, and that we cannot imagine anything beyond the variations on the themes set by these great figures of nineteenth century sociology. See Edward Shils, "Tradition, Ecology, and Institution in the History of Sociology," Daedalus, XCIX (Fall, 1970), 825.
8 and 9 are the ideal type and schematic constructions designed to illuminate the essential differences among the social structures located on a continuing production and knowledge axis. Similarly, Tables 10 and 11 provide another such differentiation organized around the development of agricultural and industrial technology.

We may analyze these structures with their principal social design and suggest that such a design of the pre-industrial society is a "game against nature": its resources are drawn from the extractive industries and it is subject to the laws of diminishing returns and low productivity. The design for the industrial society is a "game against fabricated nature," which is centered on man-machine relationships and uses energy to transform the natural environment into a technical environment. The design of the post-industrial society can be called a "game between persons," in which an intellectual technology based on information rises alongside a machine technology. As can be seen in Tables 8 and 9, there are crucial differences in the kinds of structural problems that each type of society is engaged in because of the varied nature of its social design.

---

1Bell, "The Post-Industrial Society," pp. 161-165. Whenever the distinction among these designs is not recognized, it becomes difficult to deal with social problems. For example, Bell notes elsewhere that lately two simplistic notions have shaped most of the government policies through the sixties: first, that all problems are soluble, and second, that the way to solve a problem is to pour money into it. Problems as diverse as going to the moon and clearing the slums were dealt with under these simplistic notions, that is, by building NASA and creating a huge housing program. Bell remarks that there is no recognition of the fact that these problems are not wholly congruent, and that in one case the problem is a "game against nature," and in the other, a "game..."
<table>
<thead>
<tr>
<th>Regions:</th>
<th>Pre-Industrial</th>
<th>Industrial</th>
<th>Post-Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Asia, Africa,</td>
<td>Western Europe,</td>
<td>United States</td>
</tr>
<tr>
<td></td>
<td>Latin America</td>
<td>Soviet Union,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Japan</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Economic Sector:</th>
<th>Pre-Industrial</th>
<th>Industrial</th>
<th>Post-Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Extractive:</td>
<td>Agriculture</td>
<td>Manufacturing</td>
<td>Tertiary Services:</td>
</tr>
<tr>
<td></td>
<td>Mining</td>
<td>Processing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fishing</td>
<td></td>
<td>Quaternary Trade:</td>
</tr>
<tr>
<td></td>
<td>Timber</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupational Slope:</th>
<th>Pre-Industrial</th>
<th>Industrial</th>
<th>Post-Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unskilled Worker</td>
<td>Semi-skilled Worker</td>
<td>Professional and Technical</td>
<td></td>
</tr>
<tr>
<td>Farmer, Miner, Fisherman</td>
<td>Engineer</td>
<td>Scientist</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technology:</th>
<th>Pre-Industrial</th>
<th>Industrial</th>
<th>Post-Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Materials</td>
<td>Energy</td>
<td>Information</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Design:</th>
<th>Pre-Industrial</th>
<th>Industrial</th>
<th>Post-Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Game Against Nature</td>
<td>Game Against Fabricated Nature</td>
<td>Game Between Persons</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methodology:</th>
<th>Pre-Industrial</th>
<th>Industrial</th>
<th>Post-Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Sense Experience</td>
<td>Empiricism Experimentation</td>
<td>Abstract Theory: Models, Simulation, Decision Theory, Systems Analysis</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 8—Continued

<table>
<thead>
<tr>
<th></th>
<th>Pre-Industrial</th>
<th>Industrial</th>
<th>Post-Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time Perspective:</strong></td>
<td>Orientation to the Past</td>
<td>Ad Hoc Adaptiveness-Adecateness</td>
<td>Future Orientation Forecasting</td>
</tr>
<tr>
<td></td>
<td>Ad Hoc Responses</td>
<td>Projections</td>
<td></td>
</tr>
<tr>
<td><strong>Axial Principle:</strong></td>
<td>Traditionalism</td>
<td>Economic Growth</td>
<td>Centrality of and</td>
</tr>
<tr>
<td></td>
<td>Land/Resource</td>
<td>State or Private Control of</td>
<td>Codification of</td>
</tr>
<tr>
<td></td>
<td>Limitation</td>
<td>Investment</td>
<td>Theoretical Knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decisions</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axial Principle:</th>
<th>The Centrality of and Codification of Theoretical Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Derivative Considerations</td>
</tr>
<tr>
<td>Primary Institution:</td>
<td>University</td>
</tr>
<tr>
<td></td>
<td>Academy Institutes</td>
</tr>
<tr>
<td></td>
<td>Research Corporations</td>
</tr>
<tr>
<td>Economic Ground:</td>
<td>Science-based Industries</td>
</tr>
<tr>
<td>Primary Resource:</td>
<td>Human Capital</td>
</tr>
<tr>
<td>Political Problem:</td>
<td>Science Policy</td>
</tr>
<tr>
<td></td>
<td>Education Policy</td>
</tr>
<tr>
<td>Structural Problem:</td>
<td>Balance of Private and Public Center</td>
</tr>
<tr>
<td>Stratification Base:</td>
<td>Skill</td>
</tr>
<tr>
<td>Access:</td>
<td>Education</td>
</tr>
<tr>
<td>Theoretical Issue:</td>
<td>Cohesiveness of &quot;New Class&quot;</td>
</tr>
<tr>
<td>Sociological Reactions:</td>
<td>The Resistance to Bureaucratization</td>
</tr>
<tr>
<td></td>
<td>The Adversary Culture</td>
</tr>
</tbody>
</table>

Source: Bell, "The Post-Industrial Society," p. 163.
<table>
<thead>
<tr>
<th>Important Determiners of Technology in Dominant Ages</th>
<th>Modern Craft Age 1000-</th>
<th>Machine Age 1830-</th>
<th>Power Age 1920-</th>
<th>Atomic Age 1960-</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power</strong></td>
<td>Human and animal muscle</td>
<td>Multiple horse teams and steam</td>
<td>Gasoline and electricity</td>
<td>Atomic energy used to produce electric power and heat</td>
</tr>
<tr>
<td></td>
<td>Man, horse, and mule; use of wind</td>
<td>Man, horse, and steam tractor</td>
<td>Motorized tractor, truck, electric motors</td>
<td>Alcohol-burning tractors</td>
</tr>
<tr>
<td><strong>Tools</strong></td>
<td>Hand wrought</td>
<td>Machine wrought</td>
<td>Multiple machine tools</td>
<td>Automatic radar-directed machines on fields</td>
</tr>
<tr>
<td></td>
<td>Wooden plow, cradle, scythe, horse collar</td>
<td>Iron and steel plow, mower, reaper, grain drill, self-binder, thresher, cream separator</td>
<td>Increasingly self-propelled, such as combine, corn harvester, cotton picker; and electrified machines, such as milking machine</td>
<td>Automated farm and biochemical production of food in factories</td>
</tr>
<tr>
<td><strong>Work Skills</strong></td>
<td>All-around subsistence farm skills</td>
<td>Specialized in diversified farming</td>
<td>Skills of mechanic and machine operator, and electrician</td>
<td>Highly trained engineers as designers are required</td>
</tr>
<tr>
<td>Important Determiners of Technology in Dominant Ages</td>
<td>Modern Craft Age 1000-</td>
<td>Machine Age 1830-</td>
<td>Power Age 1920-</td>
<td>Atomic Age 1960-</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>------------------------</td>
<td>-------------------</td>
<td>----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Material</td>
<td>Wood, iron, bronze</td>
<td>Steel, copper</td>
<td>Alloyed steels, light alloys, aluminum</td>
<td>Super alloys, use of new metals, plastics</td>
</tr>
<tr>
<td>Transportation</td>
<td>Walking, use of animals via dirt road</td>
<td>Steam train, horse and buggy</td>
<td>Auto, diesel train, airplane</td>
<td>Rocket and helicopter via stratosphere</td>
</tr>
<tr>
<td>Communication</td>
<td>Word of mouth, newspaper, messenger</td>
<td>Mail moved faster by rail and water; newspaper printed on steam press; telephone, telegraph</td>
<td>AM and FM radio, movie, television, microfilm, and magnetic tape</td>
<td>Televised telephone, talking book or newspaper, universal two-way radio communication, electronic machine, magnetic tape photography, voca-typewriter</td>
</tr>
</tbody>
</table>

TABLE 11
FOUR AGES OF INDUSTRIAL TECHNOLOGY

<table>
<thead>
<tr>
<th>Important Determiners of Technology in Dominant Ages</th>
<th>Modern Craft Age 1400</th>
<th>Machine Age 1785</th>
<th>Power Age 1870</th>
<th>Atomic Age 1953</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power</strong></td>
<td>Muscle, wind, and water</td>
<td>Steam</td>
<td>Electricity</td>
<td>Atomic energy</td>
</tr>
<tr>
<td><strong>Tools</strong></td>
<td>Hand</td>
<td>Machine</td>
<td>Automatic machine</td>
<td>Automatic factory</td>
</tr>
<tr>
<td><strong>Work Skills</strong></td>
<td>All-around skilled craftsman--unskilled manual worker</td>
<td>Skilled craftsman replaced by machine (semi-skilled) operators as a result of subdividing manufacturing processes</td>
<td>Skilled inspector, mechanic required as operations replace need for machine feeding or tending</td>
<td>Highly trained engineers as designers are required; skilled technicians required for maintenance</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Wood, iron, bronze</td>
<td>Steel, copper</td>
<td>Alloved steels, light alloys, aluminum</td>
<td>Plastic, super alloys; use of 32 new metals, notably magnesium and titanium</td>
</tr>
<tr>
<td><strong>Transportation</strong></td>
<td>Walking, use of animals or sailboat via dirt road and waterway</td>
<td>Steam train or steamship via steel rails and ocean way</td>
<td>Automobile, diesel train or airplane via paved highway, railway, and airway</td>
<td>Jet airplane, rocket, and helicopter via stratosphere; atomic train via railway</td>
</tr>
</tbody>
</table>
TABLE 11—Continued

<table>
<thead>
<tr>
<th>Important Determiners of Technology in</th>
<th>Modern Craft Age</th>
<th>Machine Age</th>
<th>Power Age</th>
<th>Atomic Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant Ages</td>
<td>1400</td>
<td>1785</td>
<td>1870</td>
<td>1953</td>
</tr>
</tbody>
</table>

| Communication                          | Word of mouth, newspaper, messenger | Mail moved faster by rail and water; newspaper printed on steam press; telephone, telegraph | AM and FM radio, movie, television, microfilm, magnetic tape | Televised telephone, talking book or newspaper, universal two-way radio communication, electronic machines, magnetic-tape photography, vocatypewriter |

In the industrial society, the chief economic problem is one of capital formation: how to institutionalize the process of creating sufficient savings and convert them into investment areas.¹ This has been accomplished through the equity market, investment banks, self-financing, and state taxation.² The locus between people." The latter distinction is rarely a part of policy deliberation. See Bell, "The Adequacy of Our Concepts," pp. 155-156.

¹Some have construed this problem of capital accumulation as the central phenomenon in the Marxian scheme. Marx believed that the essence of capitalism was to be found in the accumulation of capital. Aron extends the Marxian theme to the industrial society, and analyzes its mode of growth through the concept of capital accumulation. See Raymond Aron, 18 Lectures on Industrial Society (London: Weidenfeld & Nicholson, Inc., 1961), p. 235; and Raymond Aron, The Industrial Society: Three Essays on Ideology and Development, A Clarion Book (New York: Simon and Schuster, 1967), ch. 1; and Raymond Aron, "The Impact of Marxism in the Twentieth Century," in Marxism in the Modern World, ed. by Milorad M. Drachkovitch (London: Oxford University Press, 1965), pp. 2-40. Also, for those underdeveloped countries whose major objective was industrialization, Nurkse emphasized the importance of capital formation and suggested that its lack is the major impediment to their economic growth. See Ragner Nurkse, Problems of Capital Formation in Underdeveloped Countries (New York: Columbia University Press, 1961).

of social relations has been the enterprise or firm. The major social problem is that of industrial conflict between the employer and worker. To the extent that the investment process has been routinized and class conflict encapsulated, the issue of class strife no longer acts to polarize the country. These older problems of an industrial society have been muted, if not solved. 1

In the post-industrial society, the principal problem is that of the organization of science and the research institution where such work is carried out. In the nineteenth and early twentieth centuries, the strength of a nation was its industrial

---

1 Bell recently writes that the industrial society in the West was marked by three distinctive features: the growth of the corporation, the imprint of the machine and its rhythms on the character of the work, and labor conflict, which threatened to tear society apart. All three of these elements are markedly changed in the post-industrial society. Particularly in the case of labor conflicts the stakes were private, definite, and material, such as wage rates, working conditions, and work hours. The struggle was intense but limited. Once organized labor had been recognized and its capacity to contract for all its members was admitted, industrial conflict became institutionalized with a given set of rules and strategy. See Daniel Bell, as reported in Tom Bottomore, "Three Authors in Search of a Proletariat," The New York Review of Books, April 6, 1972, pp. 31-34; and François Bourricaud, "Post-Industrial Society and the Paradoxes of Welfare," Survey, XVI (Winter, 1971), 57-60. Louis Harris, one of the most reliable of the pollsters, remarks that in American society the economic issues are no longer as dominant as they used to be. Also, it was reported in a survey that the nation's young managers rate monetary remuneration as sixteenth on a list of complaints about their job situations. Louis Harris's remarks were heard on "The Perils of Polling: Campaign '72," CBS Telecast, August 13, 1972, narrator, Roger Mudd. For the survey of the young managers, see Roger Ricklefs, "The Nonconformists: Young Managers Today Less Eager to Adapt, So Firms Alter Policies," Wall Street Journal, May 10, 1973, pp. 1, 23. It should also be noted that we are approaching the beginning of an end to the phenomenon of the strike, as evidenced in a no-strike agreement hammered out recently by the United Steelworkers' Union and the steel industry. See A. H. Raskin, "Strike Suorcease," New York Times, June 5, 1973, p. 39 m.
capacity, the chief index of which was steel production.\(^1\) After the Second World War, however, the scientific capacity of a country became a determinant of its potential and power, and research and development replaced steel as a comparative measure of the strength of nations.

The nature and kinds of state support for science, the politicization of science, the sociological problems of the organization of work by science and its terms—all these become the central policy issues in the post-industrial society. However, the major economic as well as political problem is the growth of a non-market welfare economy and the lack of adequate mechanisms to decide the allocation of public goods.\(^2\)

---

\(^1\)For example, the late Prime Minister Nehru of India, the architect of the Indian policy of industrialization, once remarked that a number of textile mills is not industrialization. It is merely playing with it. Industrialization is a thing that produces steel. The worship of steel, which began in the Soviet Union, had become an overwhelming force in the underdeveloped countries that in Washington's party circles it was a joke to the effect that any newly developing country had four really urgent needs: a steel mill, a national airline, a six-lane highway, and an invitation for the president of the country to address the Washington Press Club. See Colin Clark, "Growthmanship": Fact and Fallacy, An Educational Monograph (New York: National Association of Manufacturers, 1965), p. 12. See also Drucker, The Age of Discontinuity, p. 205.

\(^2\)Bourricaud, "Post-Industrial Society and the Paradoxes of Welfare," pp. 43-59. The problem of the organization of work by science is the most crucial of all in the long run. In an age of automation, as Marcuse envisions, the machine renders possible the reversal of the relation between free time and working time on which the established civilization rests. The working time becomes marginal and free time becomes full time. The result of this would be a radical transformation of values, for, as Freud said, work was the chief means of binding an individual to reality. What will happen, then, when not only the worker but the work itself is displaced by the machine? See Herbert Marcuse, Bros and Civilization, A Philosophical Inquiry into Freud, Vintage Books.
B. Creation of the Service Economy

Clark divides the various kinds of economy into different sectors: the primary being predominantly agricultural; the secondary, manufacturing or industrial; and the tertiary, services. He argues that there is a path along which every economy would eventually pass. As soon as it becomes industrialized, at which time the demand for health, recreation, and the like increases as the national income increases, the greater proportion of its labor force would inevitably move toward the service sector.¹

¹Colin Clark, The Conditions of Economic Progress, (3rd ed.; London: Macmillan & Co., 1957). Kuznets also has described similar patterns of economic growth. For him, these stages of growth take the following sequence:

1. Food production and agriculture generally

2. Physical manufacture
   a. physical capital (transportation, power, plant, machines)
   b. consumer nondurables
   c. consumer durables

3. Industrialization of agriculture

4. Technical skills and services
   a. experts on the nonhuman environment
   b. experts on human motivation and organization

See Simon Kuznets, Toward a Theory of Economic Growth, with "Reflections on the Economic Growth of Modern Nations," The Norton Library (New York: W. W. Norton & Co., Inc., 1968), pp. 1-82. It should be noted here, however, that in a highly industrialized system all of these aspects of production are to some extent concurrent. As Moore points out, the hypothesis advanced here relates simply to priorities in the allocation of resources and
The first and simplest dimension of a post-industrial society is that the majority of the labor force is no longer engaged in agriculture or manufacturing, but in services, which are defined, residually, as trade, finance, transport, health, recreation, education, and government. As can be seen from Tables 12 to 15, the United States is the only nation in the world in which the service sector accounts for more than half of the total employment and more than half of the gross national product. It is the first service economy, the first nation in which the major portion of the population is engaged neither in agrarian nor in industrial sectors.¹

Their changes through time. Also, it has already been evidenced in the underdeveloped countries that they import plant and equipment, and some technical skills, and will start manufacturing consumer nondurables immediately. See Wilbert B. Moore, Economy and Society, Random House Studies in Sociology (New York: Random House, Inc., 1955), pp. 41-43; and Peter T. Bauer and Basil S. Yamey, The Economics of Underdeveloped Countries, Cambridge Economic Handbooks (Chicago: University of Chicago Press, 1957), ch. x. Also, for a further refinement of this theme, based on a Christian Engel theorem that as national income rises there is a shift in the slope of purchases to services, see Paul Hatt and Nelson Foote, "Social Mobility and Economic Advancement," The American Economic Review, XLIII (May, 1953), 334-378. Hatt and Foote also extend the theme in its linkage between the sectoral changes and patterns of social mobility. For them, the most important development in this linkage in modern society is the trend toward professionalization of work and the crucial importance of the intellectual sector. Ibid. Also, see Bell, "The Post-Industrial Society," pp. 105-107.

¹Furthermore, in 1947, employment stood at approximately 58 million. By 1969, it was at about 72 million. Virtually all of this increase occurred in industries that provide services, as in banks, hospitals, retail stores, and schools. This service sector is comprised of trade, finance, insurance and real estate; the personal, professional, business, and repair services; and the general government. It is now the major growth sector of the economy. See Victor K. Fuchs, "The First Service Economy," The Public Interest, Winter, 1966, pp. 7-17; and Bell, "Technocracy
<table>
<thead>
<tr>
<th>Region</th>
<th>Total labor force (millions)</th>
<th>Percentage distribution by sector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Agriculture</td>
</tr>
<tr>
<td>World</td>
<td>1,296</td>
<td>58</td>
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<tr>
<td>Africa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Africa</td>
<td>112</td>
<td>77</td>
</tr>
<tr>
<td>Eastern Africa</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>Middle Africa</td>
<td>30</td>
<td>83</td>
</tr>
<tr>
<td>Northern Africa</td>
<td>14</td>
<td>86</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>22</td>
<td>71</td>
</tr>
<tr>
<td>Northern America</td>
<td>6</td>
<td>37</td>
</tr>
<tr>
<td>Latin America</td>
<td>71</td>
<td>48</td>
</tr>
<tr>
<td>Middle America (Mainland)</td>
<td>15</td>
<td>56</td>
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<tr>
<td>Caribbean</td>
<td>37</td>
<td>52</td>
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<td>Temperate South America</td>
<td>12</td>
<td>25</td>
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<tr>
<td>Asia</td>
<td>728</td>
<td>71</td>
</tr>
<tr>
<td>East Asia (Mainland)</td>
<td>319</td>
<td>75</td>
</tr>
<tr>
<td>Japan</td>
<td>44</td>
<td>33</td>
</tr>
<tr>
<td>Other East Asia</td>
<td>15</td>
<td>62</td>
</tr>
<tr>
<td>Middle South Asia</td>
<td>239</td>
<td>71</td>
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<tr>
<td>Southeast Asia</td>
<td>90</td>
<td>75</td>
</tr>
<tr>
<td>Southwest Asia</td>
<td>20</td>
<td>69</td>
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<tr>
<td>Europe</td>
<td>191</td>
<td>28</td>
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<tr>
<td>Western Europe</td>
<td>60</td>
<td>14</td>
</tr>
<tr>
<td>Northern Europe</td>
<td>34</td>
<td>10</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>49</td>
<td>45</td>
</tr>
<tr>
<td>Southern Europe</td>
<td>47</td>
<td>41</td>
</tr>
<tr>
<td>Oceania</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>Australia and New Zealand</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Melanesia</td>
<td>1</td>
<td>85</td>
</tr>
<tr>
<td>USSR</td>
<td>111</td>
<td>45</td>
</tr>
</tbody>
</table>

Note: Owing to independent rounding, the sum of the parts may not add up to group totals.

a More developed regions

b Excluding Polynesia and Micronesia

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Industry</th>
<th>Agriculture</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>USSR</td>
<td>1913</td>
<td>9</td>
<td>75</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>1928</td>
<td>8</td>
<td>80</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>1937</td>
<td>24</td>
<td>56</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>1950</td>
<td>27</td>
<td>48</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>1958</td>
<td>31</td>
<td>42</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>1964</td>
<td>35</td>
<td>33</td>
<td>32</td>
</tr>
<tr>
<td>USA</td>
<td>1820</td>
<td>12</td>
<td>72</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>1850</td>
<td>17</td>
<td>65</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>1900</td>
<td>27</td>
<td>38</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>1920</td>
<td>33</td>
<td>28</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>1940</td>
<td>35</td>
<td>19</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>1950</td>
<td>37</td>
<td>13</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>1964</td>
<td>34</td>
<td>7</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>1972 estimate</td>
<td>31</td>
<td>5</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>2000 estimate</td>
<td>--</td>
<td>2.5</td>
<td>--</td>
</tr>
<tr>
<td>Great Britain</td>
<td>1811</td>
<td>39</td>
<td>34</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>1841</td>
<td>44</td>
<td>23</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>1871</td>
<td>49</td>
<td>15</td>
<td>36</td>
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<tr>
<td></td>
<td>1901</td>
<td>47</td>
<td>9</td>
<td>44</td>
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<tr>
<td></td>
<td>1921</td>
<td>49</td>
<td>7</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>1951</td>
<td>49</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>1963</td>
<td>47</td>
<td>4</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>1970 estimate</td>
<td>47</td>
<td>3</td>
<td>50</td>
</tr>
</tbody>
</table>

*Industry includes mining and quarrying, manufacturing industries, and construction.

*Agriculture includes agriculture, forestry, hunting, and fishing.

*Services include commerce, transport and communications, storage and warehousing, government administration and services.

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>1947</th>
<th>1957</th>
<th>1962</th>
<th>1966</th>
</tr>
</thead>
<tbody>
<tr>
<td>All wage earners and</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>salaried employees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workers in the material sphere of production</td>
<td>59.2</td>
<td>53.1</td>
<td>48.3</td>
<td>45.9</td>
<td></td>
</tr>
<tr>
<td>including:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>agriculture</td>
<td>15.8</td>
<td>10.5</td>
<td>8.6</td>
<td>5.9</td>
<td></td>
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<tr>
<td>industry</td>
<td>31.6</td>
<td>30.5</td>
<td>28.8</td>
<td>29.1</td>
<td></td>
</tr>
<tr>
<td>construction</td>
<td>3.8</td>
<td>4.9</td>
<td>4.4</td>
<td>4.8</td>
<td></td>
</tr>
<tr>
<td>transport and</td>
<td>8.0</td>
<td>7.2</td>
<td>6.5</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>communications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workers in other branches of the national economy</td>
<td>40.8</td>
<td>40.9</td>
<td>51.7</td>
<td>54.1</td>
<td></td>
</tr>
<tr>
<td>including:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>commerce</td>
<td>17.2</td>
<td>18.4</td>
<td>19.1</td>
<td>19.5</td>
<td></td>
</tr>
<tr>
<td>financial institutions, insurance and real estate</td>
<td>3.4</td>
<td>4.2</td>
<td>4.0</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>different services</td>
<td>9.7</td>
<td>11.4</td>
<td>12.8</td>
<td>14.1</td>
<td></td>
</tr>
<tr>
<td>government administration</td>
<td>10.5</td>
<td>12.9</td>
<td>15.2</td>
<td>16.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: Richta, Civilization at the Crossroads, p. 329.
TABLE 15

CHANGES IN THE OCCUPATIONAL STRUCTURE

Annual Increments of Occupations in the USA, 1950-1960
(by percentage)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Increment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office machine operators</td>
<td>+8.5</td>
</tr>
<tr>
<td>Cashiers</td>
<td>+7.4</td>
</tr>
<tr>
<td>Laboratory workers</td>
<td>+6.0</td>
</tr>
<tr>
<td>Engineers</td>
<td>+5.1</td>
</tr>
<tr>
<td>Secretaries</td>
<td>+3.8</td>
</tr>
<tr>
<td>Foremen</td>
<td>+3.5</td>
</tr>
<tr>
<td>Waiters</td>
<td>+2.6</td>
</tr>
<tr>
<td>Mechanics and repairmen</td>
<td>+2.5</td>
</tr>
<tr>
<td>Natural scientists</td>
<td>+2.5</td>
</tr>
<tr>
<td>Drivers</td>
<td>+2.5</td>
</tr>
<tr>
<td>Toolmakers</td>
<td>+1.8</td>
</tr>
<tr>
<td>Salesmen</td>
<td>+1.2</td>
</tr>
<tr>
<td>Physicians</td>
<td>+0.8</td>
</tr>
<tr>
<td>Metal workers</td>
<td>0.0</td>
</tr>
<tr>
<td>Laborers</td>
<td>-0.1</td>
</tr>
<tr>
<td>Furnacemen and smelters</td>
<td>-1.6</td>
</tr>
<tr>
<td>Self-employed managers</td>
<td>-1.7</td>
</tr>
<tr>
<td>Stokers</td>
<td>-2.7</td>
</tr>
<tr>
<td>Farm laborers</td>
<td>-3.2</td>
</tr>
<tr>
<td>Farmers</td>
<td>-3.3</td>
</tr>
</tbody>
</table>

C. Growth of the Professional and Technical Class

The uses of technology in a society, whether in productive processes or elsewhere, have three important consequences on the demand for skills in its labor force: the obsolescence of skills, the dilution of skills, and the demand for new skills. Skills are made obsolete by the declining demand for particular products and by the mechanization of operations. In a highly differentiated economy with an increasing division of labor, the specialization of tasks leads to the dilution of skills where labor is subservient to the machine. Increasing specialization of tasks also leads to the demand for new skills, including the design of processes, the coordination of specialized activities, and the supply of information.

Expansion of industrial technology has profoundly altered the kind of skills demanded from the economic population. There can be seen a steady reduction in the proportion of unskilled workers and an increase in the number of semiskilled and skilled workers. As shown in Tables 16 and 17, the distribution of skills

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and Politics," pp. 4-5. It should be noted that the kind of services emphasized here are similar to those provided by, for example, the public works department in a metropolitan area or the outpatient department of a hospital, rather than the services provided by barbers. The latter have been with us since primitive times. As Bourricaud points out, the post-industrial society is a society of services of the former kind. This also is a major problem area for the post-industrial society, because these services are diffused. It is difficult to determine who the beneficiaries are, and therefore, to assign their costs. See Bourricaud, "Post-Industrial Society and the Paradoxes of Welfare," pp. 48-51.

1Moore, Economy and Society, pp. 39-41.
has significantly changed even in the short period from 1925 to 1961. Particularly after the Second World War, knowledge has been made productive. This has brought about changes in job structure, careers, and organizations as drastic as those which resulted in the factory from the application of scientific management to manual work.¹

In identifying the change of occupational pattern—not only where people work, but the kind of work they do—we see that in the post-industrial society, expansion of the service economy, with its emphasis on trade, finance, education, and government, has naturally brought about a shift to white-collar occupations. In the United States, by 1956, for the first time in the history of industrial civilization white-collar workers outnumbered blue-collar workers in the occupational structure. Since 1956 the ratio has been widening steadily; today white-collar workers outnumber blue-collar workers by more than five to four.

As can be seen from Table 18, the most startling occupational change has been the growth of professional and technical jobs which usually require some college education. This growth rate was twice that of the average. Still more characteristic of the post-industrial society is the growth rate of scientists and engineers, which is triple that of the working population as

### TABLE 16
PERCENTAGE DISTRIBUTION BY SKILL OF WAGE EARNERS
IN THE INDUSTRY OF THE USSR

<table>
<thead>
<tr>
<th>Process of industrialization</th>
<th>Beginning of the scientific and technological revolution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1925</td>
</tr>
<tr>
<td>Skilled</td>
<td>18.5</td>
</tr>
<tr>
<td>Semiskilled</td>
<td>41.3</td>
</tr>
<tr>
<td>Unskilled</td>
<td>40.2</td>
</tr>
</tbody>
</table>

### TABLE 17
PERCENTAGE DISTRIBUTION BY SKILL OF WAGE EARNERS
IN THE U.S. ECONOMY (EXCLUDING AGRICULTURE AND SERVICES)

<table>
<thead>
<tr>
<th>Closing phase of industrialization</th>
<th>Beginning of scientific and technological revolution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1920</td>
</tr>
<tr>
<td>Skilled wage earners and foremen</td>
<td>32.3</td>
</tr>
<tr>
<td>Semiskilled</td>
<td>38.8</td>
</tr>
<tr>
<td>Unskilled</td>
<td>28.9</td>
</tr>
</tbody>
</table>

Source: Richts, Civilization at the Crossroads, p. 331. (Both tables.)
<table>
<thead>
<tr>
<th>Major occupation group</th>
<th>1964 (in millions)</th>
<th>1964 Percentage</th>
<th>1975 (in millions)</th>
<th>1975 Percentage</th>
<th>Percentage change, 1964-75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total employment</td>
<td>70.4</td>
<td>100.0</td>
<td>88.7</td>
<td>100.0</td>
<td>-26</td>
</tr>
<tr>
<td>White-collar workers</td>
<td>31.1</td>
<td>44.2</td>
<td>42.8</td>
<td>48.3</td>
<td>-38</td>
</tr>
<tr>
<td>Professional, technical, and kindred workers</td>
<td>8.6</td>
<td>12.2</td>
<td>13.2</td>
<td>14.9</td>
<td>-54</td>
</tr>
<tr>
<td>Managers, officials and proprietors, except farm</td>
<td>7.5</td>
<td>10.6</td>
<td>9.2</td>
<td>10.4</td>
<td>-23</td>
</tr>
<tr>
<td>Clerical and kindred workers</td>
<td>10.7</td>
<td>15.2</td>
<td>14.6</td>
<td>16.5</td>
<td>-37</td>
</tr>
<tr>
<td>Sales workers</td>
<td>4.5</td>
<td>6.3</td>
<td>5.8</td>
<td>6.5</td>
<td>-30</td>
</tr>
<tr>
<td>Blue-collar workers</td>
<td>25.5</td>
<td>36.3</td>
<td>29.9</td>
<td>33.7</td>
<td>-17</td>
</tr>
<tr>
<td>Craftsmen, foremen, and kindred workers</td>
<td>9.0</td>
<td>12.8</td>
<td>11.4</td>
<td>12.8</td>
<td>-27</td>
</tr>
<tr>
<td>Operatives and kindred workers</td>
<td>12.9</td>
<td>18.4</td>
<td>14.8</td>
<td>16.7</td>
<td>-15</td>
</tr>
<tr>
<td>Laborers, except farm and mine</td>
<td>3.0</td>
<td>5.2</td>
<td>3.7</td>
<td>4.2</td>
<td>b</td>
</tr>
<tr>
<td>Service workers</td>
<td>9.3</td>
<td>13.2</td>
<td>12.5</td>
<td>14.1</td>
<td>-35</td>
</tr>
<tr>
<td>Farmers and farm managers, laborers, and foremen</td>
<td>4.4</td>
<td>6.3</td>
<td>3.5</td>
<td>3.9</td>
<td>-21</td>
</tr>
</tbody>
</table>

-Projections assume a national unemployment rate of 3 per cent in 1975. The choice of 3 per cent unemployment as a basis for these projections does not indicate an endorsement of or even a willingness to accept that level of unemployment.

-Less than 3 per cent

Note: Because of rounding, sums of individual items may not equal totals.

D. Primacy of Theoretical Knowledge

What is most decisive for the organization of decisions and the control of change in the post-industrial society is the centrality of theoretical knowledge—the primacy of theory over empiricism and the codification of knowledge into abstract systems of symbols that can be utilized to illuminate many different and varied circumstances. Every modern society now lives by innovation and growth, and by seeking to anticipate the future and to plan ahead. Not to anticipate the future is to be victimized by it. It is this commitment that introduces the need

1Bell, "The Measurement of Knowledge and Technology," pp. 154-155. Many social scientists have generally agreed on the rise of the phenomenon of the professional and technical class. Boulding calls this phenomenon the "Education and Scientific Establishment." Galbraith calls it the "Educational and Scientific Estate." This essential agreement on the phenomenon can be found in the following sources: Kenneth Boulding, as quoted in Brzesinski, "The American Transition," p. 20; Galbraith, The New Industrial State, ch. xxv; Drucker, The Age of Discontinuity, Pt. Four; Herbert Simon, The Shape of Automation for Men and Management, Harper Torchbooks (New York: Harper & Row, Publisher, 1965), pp. 47-52; Harold J. Leavitt and Thomas L. Whisler, "The Management in the 1980's," Harvard Business Review, XXXVI (November-December, 1958), 41-48; and Kenneth S. Lynn and others, eds., The Professions in America (Boston: Beacon Press, 1967). However, the emergence of professional-technical experts as a governing class was envisioned nearly forty years ago by Russell. He suggested that the men who understand the complicated mechanism of a modern community and who have the habit of initiative and decision must inevitably control the course of events to a great extent. Richta also has similarly argued that the scientific mastery of modern society requires the domineering presence of a highly trained research elite and its large technical staff. See Bertrand Russell, The Scientific Outlook, The Norton Library (New York: W. W. Norton & Company, Inc., 1962), pp. 225-226; and Richta, Civilization at the Crossroads, pp. 217-226.
for planning and forecasting into society. It is innovation that makes theoretical knowledge central.¹

Tables 19 to 25 give a comparative portrait of the enormous amount of money and human energy being spent in the pursuit of theoretical knowledge in the United States and other advanced industrial countries. This also gives credibility to the notion of the primacy of theoretical knowledge. Over the past twenty years, research and development expenditures in America have multiplied fifteen times. By devoting 3 per cent of the gross national product to research and development, America has become a symbol for other countries who now regard this as a target to be reached.²

B. The Self-sustaining Technological Growth

Industrial economies became possible and matured when industrial societies were able to create the institutional mechanism for capital formation.³ A modern society, in order to avoid

---

¹Bell, "The Measurement of Knowledge and Technology," pp. 150-157. Also, Drucker views this phenomenon of knowledge in its productive application where it becomes perhaps a major unpredictable event. For him, in contemporary society knowledge has become "the central capital, the cost center, and the crucial resource of the economy." It changes labor forces, work and its institutions, learning, and politics. See Drucker, The Age of Discontinuity, pp. xi, 263-286.

²Bell, "The Measurement of Knowledge and Technology," p. 228.

³Thus, for the underdeveloped countries, a certain amount of saving and capital formation is prescribed in their efforts to become industrialized. For example, capital formation in terms of an annual reinvestment of about 10 per cent of the nation's gross national product has become the so-called "take-off" point
**TABLE 19**

**EXPENDITURES ON FUNDAMENTAL RESEARCH IN THE USA, 1965**

<table>
<thead>
<tr>
<th>Performers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Origin of funds (millions of dollars)</strong></td>
</tr>
<tr>
<td>Federal government</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Industry</td>
</tr>
<tr>
<td>Universities</td>
</tr>
<tr>
<td>Nonprofit organizations</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Percentage of performers</td>
</tr>
</tbody>
</table>

*Federal contract research centers.*

### TABLE 20

**Expenditures for Research and Development**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total expenditures for research and development in millions of dollars</td>
<td>180</td>
<td>400</td>
<td>1100</td>
<td>3400</td>
<td>6390</td>
<td>13,800*</td>
<td>18,200b</td>
<td>22,000</td>
<td></td>
</tr>
<tr>
<td>Annual percentage growth of which expenditures for basic research in millions of dollars</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>13.5</td>
<td>16.9</td>
<td>9.3</td>
<td>10.0</td>
<td></td>
</tr>
<tr>
<td>Annual percentage growth in the total expenditures for research and development</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>547</td>
<td>1,256</td>
<td>1,815</td>
<td>2,450</td>
<td></td>
</tr>
<tr>
<td>Share of basic research in that total expenditures for research and development</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>13.0</td>
<td>18.2</td>
<td>13.2</td>
<td>16.2</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>8.6</td>
<td>9.1</td>
<td>10.0</td>
<td>11.2c</td>
<td></td>
</tr>
</tbody>
</table>

*Of which about 60 per cent is military, space and atomic research

b New series replacing former series

c The research in social sciences is covered only partly so that the real share of basic research is estimated at 12 per cent.

**Source:** Richts, *Civilization at the Crossroads*, p. 346.
### TABLE 21

**COMPARISON OF THE R&D EFFORT OF THE USA WITH THAT OF OTHER WESTERN COUNTRIES**

<table>
<thead>
<tr>
<th>Country</th>
<th>GNP in billions of dollars 1964</th>
<th>GNP per capita in dollars 1964</th>
<th>Population in millions 1964</th>
<th>R&amp;D expenditure (in millions of dollars)</th>
<th>As percentage of GNP Year</th>
<th>Total R&amp;D Personnela in 10,000 per 1,000 population 1964-65 Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>103.98</td>
<td>1,774</td>
<td>58.2</td>
<td>1,430</td>
<td>1.4 1964</td>
<td>33,382</td>
</tr>
<tr>
<td>France</td>
<td>88.12</td>
<td>1,674</td>
<td>48.4</td>
<td>1,299</td>
<td>1.8 1963</td>
<td>32,382</td>
</tr>
<tr>
<td>Italy</td>
<td>49.58</td>
<td>897</td>
<td>51.1</td>
<td>290</td>
<td>0.6 1963</td>
<td>19,415</td>
</tr>
<tr>
<td>Belgium</td>
<td>15.44</td>
<td>1,502</td>
<td>9.3</td>
<td>129</td>
<td>0.9 1963</td>
<td>5,530</td>
</tr>
<tr>
<td>Netherlands</td>
<td>10.86</td>
<td>1,385</td>
<td>12.1</td>
<td>314</td>
<td>1.9 1964</td>
<td>9,227</td>
</tr>
<tr>
<td>BBC, excluding Luxembourg</td>
<td>273.98</td>
<td>179.6</td>
<td>3,462</td>
<td>1.4 64-65</td>
<td>99,942</td>
<td>63-64</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>91.90</td>
<td>1,700</td>
<td>54.2</td>
<td>2,159</td>
<td>2.3 64-65</td>
<td>59,415</td>
</tr>
<tr>
<td>Sweden</td>
<td>17.47</td>
<td>2,281</td>
<td>7.6</td>
<td>253</td>
<td>1.5 1964</td>
<td>16,425</td>
</tr>
<tr>
<td>Japan</td>
<td>69.08</td>
<td>622</td>
<td>90.9</td>
<td>892</td>
<td>1.5 1963</td>
<td>114,839</td>
</tr>
<tr>
<td>Canada</td>
<td>43.54</td>
<td>2,109</td>
<td>19.2</td>
<td>425</td>
<td>1 1963</td>
<td>13,525</td>
</tr>
<tr>
<td>United States</td>
<td>038.82</td>
<td>3,243</td>
<td>192.1</td>
<td>21,323b</td>
<td>3.4 63-64</td>
<td>474,900</td>
</tr>
</tbody>
</table>

*aFull-time equivalent.

*bEstimated according to the OECD standards and not according to those of the NSF.

<table>
<thead>
<tr>
<th>Year 1903</th>
<th>Basic research</th>
<th>Applied research</th>
<th>Development</th>
<th>Share of the state expenditures for R&amp;D in the total R&amp;D expenditures (by percentage)</th>
<th>Share of the military, space and atomic research in the total R&amp;D expenditures (by percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>12.4</td>
<td>22.1</td>
<td>65.5</td>
<td>64</td>
<td>63</td>
</tr>
<tr>
<td>Great Britaia</td>
<td>12.5</td>
<td>26.1</td>
<td>61.4</td>
<td>54</td>
<td>40</td>
</tr>
<tr>
<td>France</td>
<td>17.3</td>
<td>33.9</td>
<td>48.8</td>
<td>64</td>
<td>45</td>
</tr>
<tr>
<td>Italy</td>
<td>18.6</td>
<td>39.9</td>
<td>41.5</td>
<td>33</td>
<td>21</td>
</tr>
<tr>
<td>Belgium</td>
<td>20.9</td>
<td>41.2</td>
<td>37.9</td>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>Norway</td>
<td>22.2</td>
<td>34.6</td>
<td>43.2</td>
<td>54</td>
<td>14</td>
</tr>
<tr>
<td>Austria</td>
<td>22.6</td>
<td>31.9</td>
<td>45.5</td>
<td>40</td>
<td>12</td>
</tr>
<tr>
<td>Swedenb</td>
<td></td>
<td></td>
<td></td>
<td>48</td>
<td>34</td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
<td></td>
<td>55</td>
<td>26</td>
</tr>
</tbody>
</table>

*aYear 1904-1965

bYear 1964

Source: Richta, Civilization at the Crossroads, p.351.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>4.3</td>
<td>4.8</td>
<td>5.0</td>
<td>5.0</td>
<td>5.2</td>
</tr>
<tr>
<td>Great Britain</td>
<td>---</td>
<td>3.2</td>
<td>---</td>
<td>---</td>
<td>3.5</td>
</tr>
<tr>
<td>Federal Republic of Germany</td>
<td>2.3</td>
<td>2.4</td>
<td>2.7</td>
<td>3.0</td>
<td>3.3</td>
</tr>
<tr>
<td>France</td>
<td>1.8</td>
<td>2.0</td>
<td>2.6</td>
<td>3.0</td>
<td>3.3</td>
</tr>
<tr>
<td>Sweden</td>
<td>2.6</td>
<td>2.6</td>
<td>2.6</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2.4</td>
<td>---</td>
<td>3.0</td>
<td>3.2</td>
<td>3.1</td>
</tr>
<tr>
<td>USSR</td>
<td>2.2</td>
<td>2.4</td>
<td>2.6</td>
<td>2.8</td>
<td>2.9</td>
</tr>
<tr>
<td>Czechoslovakia</td>
<td>2.0</td>
<td>2.2</td>
<td>2.5</td>
<td>2.7</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Note: National income is calculated in conformity with the methodology of Marxist economics. Research and development expenditures in Czechoslovakia and USSR refer to non-investment expenditures only. Data for other countries include to a different degree the expenditures for machinery and instruments.

Source: Richta, Civilization at the Crossroads, p. 350.
<table>
<thead>
<tr>
<th>Year 1962</th>
<th>Czechoslovakia</th>
<th>Great Britain</th>
<th>USSR</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>thousand persons</td>
<td>thousand persons</td>
<td>thousand persons</td>
<td>thousand persons</td>
</tr>
<tr>
<td>Total number of workers employed in research and development</td>
<td>112 100</td>
<td>405 100</td>
<td>2,213 100</td>
<td>1,450 100</td>
</tr>
<tr>
<td>of which:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Experts with university education</td>
<td>24 21</td>
<td>113 28</td>
<td>529 24</td>
<td>550 38</td>
</tr>
<tr>
<td>of which:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Natural and technical sciences</td>
<td>19 17</td>
<td>90 22</td>
<td>450 20</td>
<td>400 28</td>
</tr>
<tr>
<td>of which:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) natural scientists&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4 4</td>
<td>45 11</td>
<td>90 4</td>
<td>130 9</td>
</tr>
<tr>
<td>(b) engineers</td>
<td>15 13</td>
<td>45 11</td>
<td>360 16</td>
<td>270 19</td>
</tr>
<tr>
<td>2. Social and medical sciences</td>
<td>5 4</td>
<td>23 6</td>
<td>79 4</td>
<td>150 10</td>
</tr>
<tr>
<td>B. Others&lt;sup&gt;b&lt;/sup&gt;</td>
<td>88 79</td>
<td>292 72</td>
<td>1,684 76</td>
<td>800 62</td>
</tr>
</tbody>
</table>

<sup>a</sup>Mathematicians, physicists, natural scientists, and agricultural scientists (theoretical disciplines)

<sup>b</sup>Experts with secondary education, craftsmen, clerical workers, and unskilled workers

Source: Richts, Civilization at the Crossroads, p. 348.
TABLE 25

DEMOGRAPHIC ASPECTS OF WORKERS EMPLOYED IN RESEARCH AND DEVELOPMENT

<table>
<thead>
<tr>
<th>Year 1962</th>
<th>Czechoeslovakia</th>
<th>Great Britain</th>
<th>USSR</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>For every 10,000 inhabitants from 15 to 59 years of age there are^a^:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) workers employed in research and development</td>
<td>137</td>
<td>132</td>
<td>162</td>
<td>139</td>
</tr>
<tr>
<td>b) workers employed in research and development with university education</td>
<td>29</td>
<td>37</td>
<td>39</td>
<td>53</td>
</tr>
<tr>
<td>c) workers employed in research and development with university education in technical or natural sciences</td>
<td>23</td>
<td>29</td>
<td>33</td>
<td>39</td>
</tr>
<tr>
<td>For every 10,000 economically active persons^b^ there are:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) workers employed in research and development</td>
<td>179</td>
<td>167</td>
<td>218</td>
<td>212</td>
</tr>
<tr>
<td>b) workers employed in research and development with university education</td>
<td>39</td>
<td>47</td>
<td>52</td>
<td>81</td>
</tr>
<tr>
<td>c) workers employed in research and development with university education in technical and natural sciences</td>
<td>30</td>
<td>37</td>
<td>44</td>
<td>59</td>
</tr>
<tr>
<td>For every 10,000 wage earners and salaried employees in industry^c^ and construction there are:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) workers employed in research and development</td>
<td>385</td>
<td>357</td>
<td>715</td>
<td>715</td>
</tr>
<tr>
<td>b) workers employed in research and development with university education</td>
<td>81</td>
<td>100</td>
<td>172</td>
<td>272</td>
</tr>
<tr>
<td>Year 1962</td>
<td>Czechoslovakia</td>
<td>Great Britain</td>
<td>USSR</td>
<td>USA</td>
</tr>
<tr>
<td>----------</td>
<td>----------------</td>
<td>---------------</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>c) workers employed in research and development with university education in technical and natural sciences</td>
<td>64</td>
<td>79</td>
<td>147</td>
<td>200</td>
</tr>
</tbody>
</table>

\[a\] Inhabitants from 15 to 59 years of age

\[b\] Economically active persons excluding armed forces and unemployed (USA and Great Britain)

\[c\] Industry includes mining and quarrying, manufacturing and electricity, gas and water production

Source: Richter, Civilization at the Crossroads, p. 349.
stagnation, must open up new technological frontiers continuously so that it can maintain productivity and expansion. Schumpeter described the openness of the technological frontier and envisioned the possibilities of a self-sustaining technological growth. For him, the technological possibilities were an uncharted sea. As already demonstrated in the modern chemical industry, there is no reason to expect a slackening of the rate of output through the exhaustion of technological possibilities. With the new devices of technological forecasting, the post-industrial society will be able to realize these possibilities and thereby achieve a new dimension of social change.

This is not to say that for any given class of technology there are no finite limits. Rather, the existence of a ceiling on engineering possibilities in a given class of technology does


1Joseph A. Schumpeter, Capitalism, Socialism, and Democracy (New York: Harper & Row, Publishers, 1942), p. 118. However, Boulding cautions against this kind of unchecked optimism. He suggests that in growth processes of any kind we have to be on the lookout for exhaustion of the original impetus which gave rise to the growth or the development of new impulses, such as the one which was noticed in the technological application in agriculture. In agriculture, it was an astonishing technological as well as social achievement. It made a farmer, in the United States at least, capable of producing, on less land, about fifteen times as much as his ancestors did in 1800, and almost ten times as much as his ancestors in 1900. It enabled man to tear himself away from his roots in the land to become a city-dweller. See Boulding, Beyond Economics, pp. 167-169. Also, see Drucker, Management, Technology, & Society, p. 29; and Bell, "The Post-Industrial Society," p. 166.
not provide in itself an unsurmountable barrier. There is always the presumption that an engineering breakthrough will occur.\(^1\) Figures 2 and 3 portray how, through time, technological inventions have lifted the ceiling over engineering possibilities which had the potential to become innovations.

F. Creation of Intellectual Technology

Modern intellectual technology comprises such varied techniques as linear programming, systems analysis, information theory, decisions theory, and games and simulation which, when linked to the computer, allow us to accumulate and manipulate large aggregates of data of a differentiated kind. This makes it possible for the decision-maker to obtain more complete knowledge of social and economic matters than was possible formerly.\(^2\)

Intellectual technology has already made it possible for corporations to plot alternative futures in different courses

---

\(^1\) Bell, "The Measurement of Knowledge and Technology," pp. 185-191. It should be noted here that this presumption is based on so-called Envelope-Curve Analysis. As Schon points out, this is not a forecast of innovation, but rather the presumed effects of sequential inventions on some technological parameters. It assumes that since there is some intrinsic logic in the parameter, there will necessarily be an immanent development of the parameter. For further elaboration of this, see ibid.; and Donald Schon, "Forecasting and Technological Forecasting," in Toward the Year 2000, ed. by Bell, pp. 127-138.

FIGURE 2
SPEED TREND CURVE IN ENVELOPE

Source: Bell, "Measurement of Knowledge and Technology," p. 188.
FIGURE 3

EFFICIENCY OF EXTERNAL COMBUSTION ENERGY CONVERSION SYSTEM

through the use of computers and with the growing sophistication in simulation procedures. This has also made it possible, for the first time, to conduct controlled experiments in the social sciences on a large scale. The society can now plot alternative futures and increase the extent to which it can choose and control matters that affect its communal life. Within this perspective one may reflect that by the end of the twentieth century intellectual technology may well be as decisive a factor in human affairs as machine technology has been for the past century and a half.¹

G. Further Speculations and Comparisons

The locus of an earlier industrial revolution which preceded the main industrial revolution was found in fifteenth-century research pertaining to navigation, as well as in the development of gunpowder and printing.² Underlying the main revolution was the principle of the transformation of energy from one form to another, as evidenced in the heat engine which replaced the natural engines—human beings and animals—as sources of mechanical work. The cumulative application of science and technology to the productive process which followed was the great


change of the nineteenth century. It literally remade the human environment. ¹

The second industrial revolution came into being with the appearance of machines designed to process not energy but information. Although the origins of its technology were rooted in the military problems of World War II, its primary applications and consequences were in space. In the post-industrial society the functional equivalent of navigation is the thrust into space, which requires a rapid computing capacity beyond the ability of the human brain. Similarly, the modern equivalent of gunpowder is nuclear physics, and that of printing, television and long-range instant communications.²

In Tables 26 to 36 an attempt is made to project and compare the social consequences of the industrial and post-industrial revolutions. A speculative yet progressive society emerges that increasingly differs from the industrial society in a variety of economic, political, and social aspects. In its speculative aspect, what follows is an attempt to summarize as concisely as possible the main predictions and problems of an emergent post-industrial society.


²Brzezinski, Between Two Ages, pp. 10-11.
TABLE 26
FIRST THIRD OF THE TWENTIETH CENTURY

<table>
<thead>
<tr>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russo-Japanese War</td>
</tr>
<tr>
<td>&quot;La Belle Epoque&quot; (1901-1913)</td>
</tr>
<tr>
<td>Mexican (1910) and Chinese (1911) social (and racial) revolutions</td>
</tr>
<tr>
<td>World War I--Europe partly devastated</td>
</tr>
<tr>
<td>Five major dynasties dethroned (Hohenzollern, Hapsburg, Romanov,</td>
</tr>
<tr>
<td>Manchu, and Ottoman)</td>
</tr>
<tr>
<td>Emergence of United States as leading world power</td>
</tr>
<tr>
<td>Loss of European (and democratic) morale and prestige</td>
</tr>
<tr>
<td>Rise of Communism and Soviet Union</td>
</tr>
<tr>
<td>Great Depression</td>
</tr>
<tr>
<td>Rise of Fascist ideologies and diverse dictatorships</td>
</tr>
<tr>
<td>Upsetting impact of new intellectual concepts, such as those of</td>
</tr>
<tr>
<td>Bohr, de Broglie, Einstein, Freud, and Schroedinger</td>
</tr>
</tbody>
</table>

TABLE 27
SECOND THIRD OF THE TWENTIETH CENTURY

Continued growth of Communism and Fascism
World War II—Europe again devastated
Mass murder and forced population movements on extraordinary
scale before, during, and after World War II
Intense, nationalistic competition in the development and
application of radically new technologies for both peace
and war
Decolonization
The Cold War and Neutralism
Shifts in power position
  Rise and decline of Italy, Canada, and India
  Decline and reemergence of Europe
  Decline and reemergence of Japan
  Reunification and centralization of China
  Emergence of
    Two super powers (US and USSR)
    Five large powers (Japan, W. Germany, France,
                     China, United Kingdom)
    Three intermediate powers (India, Italy, Canada)
Post-Keynesian, post-Marxian, and perhaps postcommunal and
sophisticated "development" economics
Emergence of mass-consumption societies
"Second" wave of industrial revolutions
Chinese achieve nuclear status

TABLE 28

FINAL THIRD OF THE TWENTIETH CENTURY
(Relatively Apolitical and Surprise-Free Projection)

| Continuation of basic, long-term "multifold trend"
| Emergence of "post-industrial" culture
| Worldwide capability for modern technology
| Very small world: increasing need for regional or worldwide "zoning ordinances" for control of arms, technology, pollution, trade, transportation, population, resource utilization, and the like
| High (1 to 10 per cent) growth rates in GNP per capita
| Increasing emphasis on "meaning and purpose"
| Much turmoil in the "new" and possibly in the industrializing nations
| Some possibility for sustained "nativist," messianic, or other mass movements
| Second rise of Japan (to being potentially, nominally, or perhaps actually, the third largest power)
| Some further rise of Europe and China
| Emergence of new intermediate powers, such as Brazil, Mexico, Pakistan, Indonesia, East Germany, and Egypt
| Some decline (relative) of the US and the USSR
| A possible absence of stark "life and death" political and economic issues in the old nations

Source: Kahn and Wiener, The Year 2000, p. 23.
| TABLE 29                                                                                       |
| THEBE IS A BASIC, LONG-TERM MULTIFOLD TREND TOWARD:                                           |

- Increasingly Sensate (empirical, this-worldly, secular, humanistic, pragmatic, utilitarian, contractual, epicurean or hedonistic, and the like) cultures
- Bourgeois, bureaucratic, "meritocratic," democratic (and nationalistic?) elites
- Accumulation of scientific and technological knowledge
- Institutionalization of change, especially research, development, innovation, and diffusion
- Worldwide industrialization and modernization
- Increasing affluence and (recently) leisure
- Population growth
- Urbanization and (soon) the growth of megalopolises
- Decreasing importance of primary and (recently) secondary occupations
- Literacy and education
- Increasing capability for mass destruction
- Increasing tempo of change
- Increasing universality of the multifold trend

TABLE 30

THE POST-INDUSTRIAL (OR POST-MASS CONSUMPTION) SOCIETY

1. Per capita income about fifty times the pre-industrial
2. Most "economic" activities are tertiary and quaternary (service-oriented) rather than primary or secondary (production-oriented)
3. Business firms no longer the major source of innovation
4. There may be more "consentives" (vs. "marketives")
5. Effective floor on income and welfare
6. "Efficiency" no longer primary
7. Market plays diminished role compared to public sector and "social accounts"
8. Widespread "cybernation"
9. "Small world"
10. Typical "doubling time" between three and thirty years
11. Learning society
12. Rapid improvement in educational institutions and techniques
13. Erosion (in middle class) of work-oriented, achievement-oriented, advancement-oriented values
14. Erosion of "national interest" values
15. Sensate, secular, humanist, perhaps self-indulgent, criteria become central

We expect the rise of new great powers—perhaps Japan, China, a European complex, Brazil, Mexico, or India.

There will be new political, perhaps even "philosophical," issues.

There will be a leveling off or diminishing of some aspects of the basic, long-term multifold trend, such as urbanization.

The post-industrial and industrial worlds will have been largely realized.

Some success seems likely with population control, arms control, and some kind of moderately stable international security arrangements, though probably not a "world government."

In the industrializing world, disorder, ideology, and irrational movements will probably continue to play disruptive though geographically confined roles.

In the US and Western Europe, there presumably will be either a return to certain Hellenic or older European concepts of the good life, or an intensified alienation and search for identity, values, meaning, and purpose; a search made necessary and facilitated by the unprecedented affluence and permissiveness of the post-industrial economy.

Source: Kahn and Wiener, The Year 2000, p. 25.
<table>
<thead>
<tr>
<th>Level</th>
<th>Income Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-industrial</td>
<td>$50 to $200 per capita</td>
</tr>
<tr>
<td>Partially industrial or transitional</td>
<td>$200 to $600 per capita</td>
</tr>
<tr>
<td>Industrial</td>
<td>$600 to perhaps $1,500 per capita</td>
</tr>
<tr>
<td>Mass-consumption or advanced industrial</td>
<td>Perhaps $1,500 to something more than $4,000 per capita</td>
</tr>
<tr>
<td>Post-industrial</td>
<td>Something over $4,000 to perhaps $20,000 per capita</td>
</tr>
</tbody>
</table>

TABLE 33

SIX ECONOMIC GROUPINGS IN THE YEAR 2000
(millions of people)

<table>
<thead>
<tr>
<th>Visibly Post-industrial</th>
<th>Mature Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>Union of South Africa 50</td>
</tr>
<tr>
<td>Japan</td>
<td>Mexico, Uruguay, Chile,</td>
</tr>
<tr>
<td>Canada</td>
<td>Cuba, Colombia, Peru,</td>
</tr>
<tr>
<td>Scandinavia and</td>
<td>Panama, Jamaica, etc. 250</td>
</tr>
<tr>
<td>Switzerland</td>
<td>N. Vietnam, S. Vietnam,</td>
</tr>
<tr>
<td>France, W. Germany,</td>
<td>Thailand, the</td>
</tr>
<tr>
<td>Benelux</td>
<td>Philippines, etc. 250</td>
</tr>
<tr>
<td></td>
<td>Turkey 75</td>
</tr>
<tr>
<td></td>
<td>Lebanon, Iraq, Iran, etc. 75</td>
</tr>
<tr>
<td>Early Post-industrial</td>
<td>700</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>55</td>
</tr>
<tr>
<td>Soviet Union</td>
<td>350</td>
</tr>
<tr>
<td>Italy, Austria</td>
<td>70</td>
</tr>
<tr>
<td>E. Germany,</td>
<td>35</td>
</tr>
<tr>
<td>Czechoslovakia</td>
<td>75</td>
</tr>
<tr>
<td>Israel</td>
<td>350</td>
</tr>
<tr>
<td>Australia, New Zealand</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>700</td>
</tr>
<tr>
<td>Mass Consumption</td>
<td>3,180</td>
</tr>
<tr>
<td>Spain, Portugal, Poland,</td>
<td>3,180</td>
</tr>
<tr>
<td>Yugoslavia, Cyprus,</td>
<td>3,180</td>
</tr>
<tr>
<td>Greece, Bulgaria,</td>
<td>3,180</td>
</tr>
<tr>
<td>Hungary, Ireland</td>
<td>3,180</td>
</tr>
<tr>
<td>Argentina, Venezuela</td>
<td>3,180</td>
</tr>
<tr>
<td>Taiwan, N. Korea,</td>
<td>3,180</td>
</tr>
<tr>
<td>S. Korea, Hong Kong,</td>
<td>3,180</td>
</tr>
<tr>
<td>Malaysia, Singapore</td>
<td>3,180</td>
</tr>
<tr>
<td>Pre-industrial or Small</td>
<td>3,180</td>
</tr>
<tr>
<td>and Partially Industrialized</td>
<td>3,180</td>
</tr>
<tr>
<td>Rest of Africa</td>
<td>350</td>
</tr>
<tr>
<td>Rest of Arab World</td>
<td>100</td>
</tr>
<tr>
<td>Rest of Asia</td>
<td>300</td>
</tr>
<tr>
<td>Rest of Latin America</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>850</td>
</tr>
</tbody>
</table>

Source: Kahn and Wiener, The Year 2000, p. 60.
TABLE 34

A LEISURE-ORIENTED "POST-INDUSTRIAL" SOCIETY
(1100 Working Hours per Year)

<table>
<thead>
<tr>
<th>7.5 Hour Working Day</th>
<th>4 Working Days per Week</th>
<th>39 Working Weeks per Year</th>
<th>10 Legal Holidays</th>
<th>3 Day Weekends</th>
<th>13 Weeks per Year Vacation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Or 147 Working Days and 218 Days Off/Year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thus in a Leisure-Oriented Society One Could Spend:

- 40 percent of his days on a vocation
- 40 percent of his days on an avocation
- 20 percent (or more than 1 day per week) on neither--that is, just relaxing

In a "Normal" Post-industrial, Affluent Society of Those (40 percent) Normally in the Labor Force:

- 50% Work normal year
- 20% Moonlight
- 10% "Half-time hobbyists"
- 5% Frictional unemployment
- 5% Semifrictional unemployment
- 5% Revolutionary or passive "dropout"
- 5% "Voluntarily" unemployed

100%

### TABLE 35

**COMPOSITION OF TIME-BUDGET IN THE USA**

(by percentage)

<table>
<thead>
<tr>
<th></th>
<th>1900</th>
<th>1950</th>
<th>2000 (forecast)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time per year for total population</strong></td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Sleep</td>
<td>39.7</td>
<td>38.7</td>
<td>38.9</td>
</tr>
<tr>
<td>Work</td>
<td>12.9</td>
<td>9.9</td>
<td>7.1</td>
</tr>
<tr>
<td>School</td>
<td>1.7</td>
<td>2.4</td>
<td>3.1</td>
</tr>
<tr>
<td>Household</td>
<td>9.2</td>
<td>5.1</td>
<td>3.2</td>
</tr>
<tr>
<td>Time for children</td>
<td>4.5</td>
<td>4.2</td>
<td>3.8</td>
</tr>
<tr>
<td>Personal care</td>
<td>5.5</td>
<td>5.0</td>
<td>5.6</td>
</tr>
</tbody>
</table>

**Total**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leisure time during day</strong></td>
<td>10.8</td>
<td>14.2</td>
<td>12.9</td>
</tr>
<tr>
<td>Weekend</td>
<td>7.5</td>
<td>13.5</td>
<td>16.7</td>
</tr>
<tr>
<td>Vacation</td>
<td>2.5</td>
<td>2.6</td>
<td>6.3</td>
</tr>
<tr>
<td>Retirement</td>
<td>0.9</td>
<td>1.8</td>
<td>1.9</td>
</tr>
<tr>
<td>Other</td>
<td>4.8</td>
<td>2.0</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**Residual**

|                      | 26.5 | 34.1 | 38.4           |

### TABLE 36

**YEAR 2000 ECONOMIC SCENARIOS FOR USA AFFLUENCE**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>318 million</td>
</tr>
<tr>
<td>Employed Labor Force</td>
<td>122 million</td>
</tr>
<tr>
<td>Leisure-Oriented Society</td>
<td>Work year 1100 hours</td>
</tr>
<tr>
<td>Total GNP</td>
<td>$2,321 billion</td>
</tr>
<tr>
<td>Per Capita GNP</td>
<td>$7,300</td>
</tr>
</tbody>
</table>

V. THE POST-INDUSTRIAL CORPORATE ORGANIZATION

A. The Imperatives of Technology: An Overview

Changes in the social organization—such as those from the society of the feudal lord to the society of the industrial capitalist—are essential for realization of the opportunities inherent in any new technology. These changes imply alterations in the ways in which people and institutions are organized to accomplish their purposes.

The heightened prominence of technology in contemporary society presents us with the interrelated tasks of profiting from its opportunities and containing its dangers. Whenever these opportunities were enjoyed, as in successful technological application in the areas of space, communications, and industrial production, three things were found in an adequate combination: technical inventiveness, adequate resources, and institutional adaptiveness. In the areas where these elements were not

---

1 The following sources were particularly useful in developing this chapter: Galbraith, The New Industrial State, pp. 71-108; Robert L. Heilbroner, "Capitalism Without Tears," review of The New Industrial State, by John Kenneth Galbraith, in The New York Review of Books, June 29, 1967, pp. 16-19; and "Perspectives on Business," special issue of Daedalus, XCVIII (Winter, 1969). Many of the references that follow were first found in these works, and later traced to their original sources for further research.

2 It is for these reasons that technology takes on a special significance in the context of an industrial society where certain economic norms, such as profit maximization or cost minimization, are well established. Heilbroner views this in terms of technological determinism. In these societies, both the continuous appearance of technical advance and its diffusion throughout the society assume the attributes of an autonomous
optimally combined, the society had failed to take full advantage of its technological opportunities. ¹

The failure of society to respond to the opportunities created by technological changes means that much actual or potential technology lies fallow. This is so because existing social structures are inadequate and prevailing value systems are poorly attuned to exploiting the opportunities which technology offers.²

Researchers who have studied the failures of technological applications in solving the problems, for example, of urban ghettos, have consistently found that these failures were due to the traditional institutions, attitudes, and approaches which were generally incapable of coming to grips with the technology. Many of these problems were indeed caused by the technological change, but the existing social mechanisms seem unable to realize the possibilities for resolving such problems that are also inherent in technology.³

---

¹Mesethene, Technological Change, pp. 34-38.

²Ibid. Moore explains this in terms of cultural lags, and suggests that had it not been for these lags—that is, resistance to structural and normative adaptations occasioned by technological innovation—the social structure would collapse, or rather, would not have existed in the first place. He further suggests that technological innovations are always accepted, rejected, or counterbalanced within a given social framework which also goes through its own alteration due to the same innovations. See Moore, Economy and Society, pp. 30-38.

³Mesethene, Technological Change, pp. 34-38. For field research and analysis of such cases, see Richard S. Rosenbloom.
The most important area of possible technological change is in the field of social innovations, because the very strains which modern technology puts on the society create a demand for social innovation which did not exist before. When material technology is only advancing slowly, social innovation may keep pace with it fairly easily. In the last three hundred years we have had such social innovations as banking, insurance, corporation, and income tax, all of which represent, in a sense, a response on the part of the social system to challenges presented by the growth of material technology. However, with the qualitative changes that seem to be taking place in material technology now, greater demands are being placed on social revolution.1

The central point about the emergence of the post-industrial society is that it will require more societal guidance and innovative expertise. In the post-industrial age, the old assumptions—the moving ideologies of social progress—are dissolving,

1Boulding, Beyond Economics, pp. 171-173. Elsewhere, Boulding warns that the greatest danger facing mankind today is the lag between scientific technology and social institutions. Therefore, he suggests, the social scientist should begin a process of purposeful innovation in the social sphere to match the successful efforts of the natural scientists to modify the physical world. See Kenneth E. Boulding, as reported in "The Existing Technology is Basically Suicidal," Business Week, January 4, 1969, p. 82. Similarly, Drucker suggests that unlike the last century, the technological innovations of our century will be as much social as they will be technical, and that the innovation in this century will be based increasingly on knowledge of any kind rather than on natural science alone. See Drucker, Management, Technology & Society, pp. 35-37. This argument is extended in Peter F. Drucker, America's Next Twenty Years (New York: Harper & Brothers, 1957). Also, see Dahl and Lindblom, Politics, Economics and Welfare, pp. 6-9.
and the search for a new framework of thought becomes imperative if we are not to lose the human values, too.¹

The major question that technology raises is not technical, but human: What does technology do to man as well as for him?

Modern technology in this century has made man reconsider old concepts, such as the position of women in society, and it has remade basic institutions—work, education, and welfare, for example. It has shifted a large number of people in the technologically advanced countries from working with their hands to working, almost without direct contact with materials and tools, with their minds. It has changed... the environment of man from one of nature to the man-made big city. It has further changed man's horizon, while it converts the entire world into one rather tight community sharing knowledge, information, hopes, and fears, technology has brought outer space into man's immediate, conscious experience. It has converted an apocalyptic promise and an apocalyptic threat into concrete possibilities here and now: offering both the utopia of a world without poverty and the threat of the final destruction of humanity.²

If technological revolutions create an objective need for social and political innovations, then the central issue here is: What is the import of the post-industrial technological revolution for the giant corporate organization? What do they now have to contribute to us and to future generations? Can such a business system, having shaped and having been shaped by industrialization, still serve us well in the post-industrial society?³ These


²Drucker, Management, Technology & Society, p. 77.

corporations and other socioeconomic institutions would have to deal with the post-industrial realities.

Some authors have concluded that the major effect of an active science and technology and of a commitment to knowledge as an instrument of social action is a progressive enhancement.¹ Others have argued, however, that any evaluation of the technological advance must take into account the destruction of natural resources, the dehumanization introduced into daily life, and the mounting tide of frustration and violence in the society as a whole.² Between these two widely diverse reflections on the impact of technology, we enumerate, as an overview, the following six imperatives of technology as it affects the modern corporate organization:

¹ Nesthene, Technological Change, pp. 64-70. For example, consider in contrast to the proliferation of sophisticated economic analysis in modern corporate decision-making, that a distinguished British economist of the last generation had once asked, "Who would ever think of employing an economist to run a brewery?" See Samuelson, "The Maximum Principles in Analytical Economics," p. 249. Similarly, the Haldane Committee's recommendation in 1918 that the British government should institute a Central Department of Research was considered at the time to exaggerate the role of research. See Dahl and Lindblom, Politics, Economics and Welfare, p. 79.

² This is the thrust of a general argument that is developed in B. J. Mishan, Technology and Growth: The Price We Pay (New York: Praeger Publishers, Inc., 1970). A shorter statement on the same theme appears in B. J. Mishan, "Making the Future Safe for Mankind," The Public Interest, Summer, 1971, pp. 33-61; and B. J. Mishan, "Growth and Anti-Growth: What Are the Issues?" Challenge, The Magazine of Economic Affairs, XVI (May-June, 1973), 26-41. For Mishan, the technological progress is a dehumanizing process that constricts the direct flow of understanding and sympathy between people. He writes that in "the unending pursuit of progress men are driven even farther apart and come to depend instead, for all their services and experiences, directly upon the creations of technology." See Mishan, Technology and Growth, pp. 154-155.
1. An increasing span of time separates the beginning from the completion of any task.

2. There is an increase in the capital that is committed to production aside from that occasioned by the increased output.

3. With increasing technology, the commitment of time and money tends to be made more inflexibly to the performance of a particular task.

4. Technology requires specialized manpower.

5. The inevitable counterpart of specialization is organization which brings the work of specialists to a coherent result.

6. From the time and capital that must be committed, the inflexibility of this commitment, and the needs of market performance under the conditions of advanced technology, comes the necessity for planning.¹

What follows is a further elaboration of some of these imperatives.

B. Emergence of the Technostructure

The increasing reliance on knowledge and information for organizational decision-making has led to some basic changes in the distribution of power within corporate organizations. Most

¹Galbraith, The New Industrial State, pp. 24-29. In support of his contention about the technological imperatives, Galbraith cites the example of the Ford automobile, Mustang, which was introduced in the market in the spring of 1964. From late in the autumn of 1962, when the design was settled until it finally emerged, there was a fairly firm commitment which required an outlay of engineering and styling costs of nine million dollars, and tooling-up costs of fifty million dollars. In contrast to this, Ford's first car in 1906 was ready for sale within four months. Ibid., pp. 23-24.
noticeably, there has been a slow but steady development in the
direction of increasingly centralized planning of organizational
decisions. The rapid pace of technological and other changes
puts a premium on anticipating events and planning for them.
Power gravitates into the hands of those who control the infor-
mation and correlate it most rapidly. Information flows are as
important to the life and health of an organization as the flow
of blood is to the life and health of an individual.¹

Organized intelligence replaces ownership as the source
of power in the modern corporate structure, because planning takes
precedence as a result of the decline of the market as a guiding
influence.² The locus of power is no longer vested in a single

¹George A. Steiner, Top Management Planning (Toronto:
vein, Wiener remarks that any organism is held together by the
possession of means for the acquisition, use, retention, and
transmission of information. See Norbert Wiener, Cybernetics
(New York: John Wiley & Sons, Inc., 1948), p. 187. Also, see
Peter F. Drucker, "Long Range Planning: Challenge to Management
Science," in Information for Decision Making: Quantitative and
Behavioral Dimensions, ed. by Alfred Rappaport (Englewood Cliffs,
N. J.: Prentice-Hall, Inc., 1970), pp. 11-13; Leavitt and
Whisler, "Management in the 1980's," pp. 41-42; Melvin Anschel,
"The Manager and the Black Box," Harvard Business Review, XXXVIII
(November-December, 1960), 85-92; Simon, The Shape of Automation
for Men and Management, pp. 23-43; and H. T. Ansoff, "The Firm of
the Future," Harvard Business Review, XCVIII (September-October,
1965), 102-178.

²Heilbroner, "Capitalism Without Tears," pp. 16-17. How-
ever, the nature of corporate planning is different from what we
are accustomed to believe. Usually the planning is associated
with the grand design of the government. Corporate planning, on
the other hand, as Heilbroner elaborates, consists of the more
or less uncoordinated efforts of corporations to secure an en-
vironment of order and stability. In this objective, they try to
seek the willing or unwilling partnership of the union, consumer,
competitor, and government. Ibid. See also Galbraith, The New
Industrial State, ch. iii. Further support of this theme can be
person as it used to be in the case of such business magnates as Ford, Rockefeller, and Morgan. Rather, it is the technostructure, an interlocking structure of specialists, technicians, experts, and organization men, who collectively guide the giant corporation. It is part of the mythology of capitalism that we still


1 Comparing the modern businessman with the medieval warrior who was rendered obsolete by a weapons technology and by the guns which democratized the battlefield and made a peasant or an artisan as lethal as a prince, Schumpeter has observed that similarly the capitalist is a victim of the technological change which he himself has brought about. A perfectly bureaucratic giant industrial corporation not only ousts the small or medium-sized firm but also ousts the entrepreneur. See Schumpeter, *Capitalism, Socialism and Democracy*, ch. xii. However, it should be noted that the bureaucratization of the industrial hierarchy is also its democratization. Newcomber notes that an increasing number of men from lower economic backgrounds are now assuming the top executive positions. Nepotism is more limited in the large corporations where education, rather than family or friends, has become the main criterion. See Mabel Newcomber, *The Big Business Executive: The Factors That Made Him, 1900-1950* (New York: Columbia University Press, 1955), chs. v, vi.

2 This is the basic Galbraithian scheme of technostructure. See Galbraith, *The New Industrial State*, ch. vi. There are few debates in contemporary economic literature, however, that were so heatedly discussed. Some have argued that the whole notion that the technostructure runs the corporation is bred in part out of exaggerated self-esteem. See Samuelson, "Liberalism at Bay," p. 27; and Paul M. Sweezy, "On the Theory of Monopoly Capitalism," *Monthly Review*, XXIII (April, 1972), 1-23. Others have argued that the notion of the technostructure rests on a thorough misunderstanding of what experts do and what businessmen do. For this view, see Letwin, "The Past and Future of the American Businessman," pp. 15-22; Drucker, "The New Markets and the New
clinging to the notion that power is wielded most effectively and efficiently by the single entrepreneur. In fact, it is the committee system of the technostructure, with its combination of impersonality, specialization, and bureaucratic structure which has proven indispensable to the administration of the modern Capitalism," pp. 44-79; and Papandreou, *Man's Freedom*, pp. 34-39.

In spite of the many diverse views, however, the important fact emerges that the corporation now is, more than a few dominant persons, a structure of occupational roles even in the higher reaches of its organization. Its structural fusion with the owning lineage has been broken for the large-scale, pace-setting sector of modern capitalism. In structural terms, writes Parsons, this is probably the most crucial change in the economy since the Marxian diagnosis was made. See Talcott Parsons, *Structure and Process in Modern Societies* (New York: Free Press, 1960), pp. 110-116.

Thus, Gordon writes that the chief executive of our largest corporation is not the restless, dynamic individual of an earlier generation who, owning his company, pioneered into new lines and "risked his shirt" building up a new business organization. Rather, he is a professional executive doing a management job—coordinating his firm's activities, approving decisions that flow up to him from his subordinates. See Robert Aaron Gordon, *Business Leadership in the Large Corporation* (Berkeley: University of California Press, 1961), ch. iv. However, this is not to say that there do not now exist any financial and business magnates who build industrial empires. They do exist. James Ling, formerly of Ling-Temco-Vought, Inc., is one spectacular example of that vanishing breed. He was quick to learn, however, as did many before him, that it is one thing to take over some of the country's leading corporations and quite another to have to manage them. See Robert B. Mims, "The Art Form Jim Ling Created," review of *Ling*, by Stanley H. Brown, *Business Week*, August 20, 1972, p. 10. Also, Sutton and his associates deal at length with how the ideological myth of the capitalist entrepreneur is created and sustained. See Francis X. Sutton and others, *The American Business Creed* (New York: Shcken Books, 1962), Part II. Further, for a sociological perspective on the decline of the innovative element in the corporate organization, see Paul F. Lazarsfeld, "Sociological Reflections on Business: Consumers and Managers," in *Social Science Research on Business: Product and Potential*, ed. by Robert A. Dahl and Paul F. Lazarsfeld (New York: Columbia University Press, 1959), pp. 139-144.
Modern economic society can only be understood as a successful effort to synthesize by organization a group personality far superior for its purposes to a natural person, and with the added advantage of immortality. The need for such a group personality arises because in modern corporations a large number of decisions, and all decisions that are important, draw on information possessed by more than one man. Typically, they draw on specialized scientific and technical knowledge, and the accumulated information and experience. The need to draw on, and


2Averitt sees in this a historical trend by which business attempts to escape the life cycle of specific human beings. Most of the corporate structures, having been freed from this cycle, are now seeking to outstrip the bounds of the depression-prosperity cycles of specific products, industries, and national economies through conglomerate diversification and multinational markets. See Averitt, "American Business," pp. 71-72.

3Thus, Drucker writes that modern corporate organization is no longer that of the bosses but of highly specialized professionals who exercise autonomous and responsible judgment. See Drucker, "Long Range Planning," p. 112. Also, see Leavitt and Whisler, "Management in 1980's," p. 47. Silk views this development in light of the increasingly intellectual demands of American business. Similarly, Parsons suggests that the harnessing of scientific knowledge to industrial production, a trend which was
appraise information from numerous individuals in modern industrial decision-making is a major technological imperative. The imperatives of technology and organization, and not the images of ideology, determine the shape, structure, and decision-making processes of the post-industrial corporate organization.¹

C. The Giant Scale

The development and application of technology seem increasingly to require large-scale and complex social concentrations. Inherent in the dynamics of technology is a constant thrust toward centralization and integration. Incorporation of new mathematical techniques and computer technology in decision-making causes the impact of integration to be felt more immediately

originated in Germany but taken farthest in the United States, is the basic imperative for a technology. See Leonard Silk, "Business Power, Today and Tomorrow," Daedalus, XCIII (Winter, 1959), 181-186; and Parsons, The System of Modern Societies, pp. 107-109. Furthermore, the pervasive character of professional expertise is as predominant in education, military and foreign affairs, and domestic government as it is in business. See Dahl and Lindblom, Politics, Economics and Welfare, pp. 73-76.

¹Galbraith, The New Industrial State, pp. 19, 42-45. This is also the basic theme of those who believe that there is a convergence pattern between the capitalist and socialist nations. By making the social structure of the productive system a central element in economic theory, Marx originally conceived the socialist ownership and provided the conceptual foundation of the socialist state. However, the large-scale organization with a specialized task structure is primarily the product of industrial technology, and not of the peculiar social institutions of capitalism. It is in this perspective that Dahl and Lindblom, among others, believe that both socialism and capitalism are dead. The rapidity of technological innovation in our time has made technology, and not these "isms," the kernel of rational social action. See Moore, Economy and Society, pp. 20-21; and Dahl and Lindblom, Politics, Economics and Welfare, pp. 9-10.
and finally than ever before.

The physical dispersion made possible by transportation and communication technology also tends to enlarge the organizational complex that can and must be governed as a unit. Consequently, we have enormous increases in the optimum size of organizations, with the operation of such giant scale organizations as General Motors, the United Auto Workers' Union, and the United States Department of Defense, to name a few.¹

The tendency among American corporations to grow in size is not new, however. As early as 1871, when Henry Adams returned to America, he is said to have noted that size and increased facility of combination had become the striking characteristics of the economy.² Most studies of the concentration of business

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¹Boulding, "Technology and the Love-Hate System," p. 47. Russell envisioned this nearly half a century ago when he wrote that the social effect of modern scientific technique was to demand in all directions an increase in both the size and intensity of organizations. See Bertrand Russell, The Scientific Outlook, The Norton Library (New York: W. W. Norton & Co., Inc., 1902), p. 198. In all technology, however, computers must be singled out because with their increasing sophistication as a tool of decision-making, they have removed many of the traditional constraints on the size of organizations which can be efficiently run by a single board of management. Moreover, Simon views the computer as the fourth great breakthrough in history to aid man in his thinking process and decision-making ability, the other three being the invention of writing, the Arabic number system, and the invention of analytical geometry and calculus. See Herbert A. Simon, The New Science of Management Decision (New York: Harper & Row, Publishers, 1960), p. 34. Also, see Andrew Shonfield, "Business in the Twenty-First Century," Daedalus, XC VIII (Winter, 1969), 194-197.

²Robert Presthus, The Organizational Society (New York: Alfred A. Knopf, 1962), p. 59. Between 1898 and 1902, this culminated in the greatest merger movement in American history. In the early 1800's, no single plant controlled as much as ten per cent of the output of a manufacturing industry. By 1904,
size focus on the preponderance of the top 500 manufacturing companies. Yet to describe the contemporary American economic landscape, this still casts the net too wide. If the trend toward concentration is not new, the intensity and concentration of strength within the concentrate itself certainly are.¹

Among the top 500 industrial corporations, a group of only fifty at the top enjoy an aggregate sales as large as that of the bottom 450; moreover, the profits of the top ten companies are equal to almost half of those of the remaining 490. In 1962, just five of the largest industrial corporations in the United States, with combined assets in excess of $30 billion, possessed over 12 per cent of all the assets used in manufacturing. The fifty largest corporations had over a third of all manufacturing assets. In 1965, three industrial corporations—General Motors, Standard Oil of New Jersey, and Ford Motor Company—had more income than all of the farms in the nation. The gross revenues of each of these three corporations far exceed those of any single

seventy-eight enterprises controlled over half the output of their industries, fifty-seven controlled 60 per cent or more, and twenty-eight controlled 80 per cent or more. In 1890, there were not a dozen ten million dollar companies in the nation. By 1904, there were over three hundred of them with a capitalization of over 7,000,000. Combinations, usually in the form of holding companies, occurred in nearly all major American industries. See Chandler, "The Role of Business in the United States," pp. 30-33; and J. S. Bain, "Industrial Concentration and Antitrust Policy," in The Growth of the American Economy, ed. by Harold Williamson (2nd ed.; Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1951), p. 619. Also, see Heilbroner, The Making of Economic Society, pp. 117-119.

state. The revenues of General Motors alone, in 1963, were fifty times those of Nevada, eight times those of New York, and only slightly less than one-fifth those of the federal government. There may be eleven other countries in the world with a gross national product larger than the total sales of General Motors. Nothing so characterizes the American industrial system as the scale of its modern corporate enterprise.¹

The giant scale of the modern corporation is in the service, not of monopoly or the economics of scale, but of technology and planning. The corporation is the basic planning unit in the American industrial system, and corporate activities--such as

¹Galbraith, The Industrial State, pp. 80-87. Also, see Hearings before the Subcommittee on Anti-Trust and Monopoly of the Committee of the Judiciary, United States Senate, Eighty-eighth Congress, Second Session, Pursuant to S. Res. 202, Part I, Economic Concentration, Overall and Conglomerate Aspects (1964), p. 113; and Carl Kaysen, "The Corporation: How Much Power? What Scope?" in The Corporation in Modern Society, ed. by Mason, pp. 80-87. However, it should be pointed out that this concentration, as large as it seems, does not have the momentum of the twenties. Rather, as Adelman points out, the level of concentration within the industrial market has slowed down to the pace of a glacial drift. With a few exceptions, such as the automobile industry, the percentage of business accruing to the biggest firms in different industrial fields is more or less stationary. See M. A. Adelman, "The Measure of Industrial Concentration," Review of Economics and Statistics, XXXIII (November, 1951), 269-296; and Edward S. Mason, Economic Concentrations and the Monopoly Problem (New York: Atheneum, 1964), pp. 36-44. In the absolute size of these corporations, surely no division of American business is more meaningful than the one separating large and small businesses. So important is this cleavage that the Congress established the Small Business Administration to aid the firms lacking the preponderant size. See Averitt, "American Business," p. 66. When thinking about the characteristic size of the corporation, one is reminded of a revealing remark by Galbraith: "The foreign visitor, brought to the United States, visits the same firms as do the attorneys of the Department of Justice in their search for monopoly." See John Kenneth Galbraith, American Capitalism: The Concept of Countervailing Power (rev. ed.; Boston: Houghton Mifflin Co., 1950), p. 91.
devising new methods of production, developing new products to satisfy consumer wants, or creating new wants—provide the key to the actual process of technological innovation.\textsuperscript{1} For technological application and planning, which imply control of supply, control of demand, provision of capital, minimization of risk, etc., "there is no clear upper limit to the desirable size. It could be that the bigger the better."\textsuperscript{2}

\textsuperscript{1}This is because the bigger corporations have internalized the process of innovation as a result of their heavy reliance on research and development. Not being subject to heavy competitive pressures and enjoying the increased affluence and liquidity, large corporations are likely to increase their expenditures or investment in new plant development and equipment, in outlays for research and development, or in the support of pure science and higher education. See Fritz Machlup, "Corporate Management, National Interest, and Behavioral Theory," The Journal of Political Economy, LXXV (October, 1967), 774. See also Silk, "Business Power, Today and Tomorrow," pp. 170-179; and Schumpeter, Capitalism, Socialism and Democracy, pp. 117-120.

\textsuperscript{2}Galbraith, The New Industrial State, p. 88. However, both Rostow and Papandreou take a differing view on this. After studying the oil industry, Rostow concludes that in it, as in many others, the large size of the corporate units is not a necessity based on technological imperatives. On balance, the large size of the business unit does not necessarily result in important technological advantages. He suggests that the bigness of the large integrated oil companies has substantially nothing to do with their efficiency or their costs. Eugene Rostow, A National Policy for the Oil Industry (New Haven, Conn.: Yale University Press, 1958). Similarly, Papandreou writes, it is clearly not enough to argue that modern technology and industrial planning impose the need for some undefined large size on the contemporary firm. Rather, he relates the size and other modern characteristics of the firm to the institutions and the overall value system of industrial society in the United States. See Papandreou, Man's Freedom, pp. 31-34. Marris, on the other hand, states that professional business management in the contemporary capitalist society is directed toward maximum expansion of the gross assets which the particular corporate manager controls. This is the case where the minimum condition of financial security has been achieved in a large corporation. Thus, Marris contends, the major objective of managers is not profit maximization but a sustainable growth rate. In effect, the managerial motive of
Thus, the corporations become bigger and bigger. A mere 500 out of nearly eleven million business enterprises produce close to half of all the goods and services available in the United States. The removal of only 150 of those at the top of the economy, in a chain-effect, could effectively alter the national economic character as we know it.¹ This hypothetical catastrophe might be compared with the near-equanimity with which we face the regular disappearance of a hundred times that many businesses due to the bankruptcies that annually thin the ranks expanding one's area of authority, rather than the nature of the market, shapes the primary corporate objectives on size. See Robin Marris, "Galbraith, Solow, and the Truth about Corporation," The Public Interest, Winter, 1968, pp. 37-46. For an enlarged discussion and its theoretical as well as empirical testing, see Robin Marris and Adrian Wood, eds., The Corporate Economy: Growth, Competition and Innovative Potential, Harvard Studies in Technology and Society (Cambridge: Harvard University Press, 1971). Also, see Shonfield, "Business in the Twenty-First Century," pp. 194-197.

¹Heilbroner, The Limits of American Capitalism, p. 13. Averitt also speculates similarly, and suggests that should nineteen of the leading American business organizations, divided among the electrical, farm machinery, aluminum, copper, rubber, and automobile industries, suddenly disappear, six of our key industries would virtually vanish. If this reveals the awesome power of the big corporations, it also implies their limitations, for none of these firms would have the right to starve the cities, bankrupt the country, and other like things. As Rose points out, power in the United States is diffused among the government agencies, trade unions, farm blocs, civil rights groups, lobbies, and individual citizens—all aware of their right to oppose and constrain the powers of a great corporation. However, this is not to deny the considerable power of corporations over individual employees, suppliers, and customers, but rather to imply that there are limits to the exercise of corporate power. See Averitt, "American Business," pp. 60-68; Arnold Rose, The Power Structure: Political Process in American Society (New York: Oxford University Press, 1967); Adolf A. Berle, Jr., The Three Faces of Power (New York: Harcourt, Brace & World, 1967), pp. 39-45; and Silk, "Business Power, Today and Tomorrow," pp. 174-176.
of America's business.  

Of more profound importance is the fact that now the world of super-corporation knows no national boundaries or sovereignties. Two decades ago nearly all but a handful of the major American businesses were entirely American or North American in their geographic orientation. Today, the great majority of major manufacturing companies are multinational. Indeed, the American companies producing in Europe are the world's third largest industrial power, out-produced only by the United States and Russia, and in turn out-producing even Japan and Germany. It is predicted that by 1985 or thereabouts, the bulk of the world's supply

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1 Further, only one-third of all small, newly established firms live to age five; about one-fifth survive to age ten; but after the treacherous first ten years have passed, the survival rate becomes quite high. See Heilbroner, The Limits of American Capitalism, pp. 12-13; and Averitt, "American Business," pp. 64-66.

2 This development is in a sequence of stages where a firm passes from engaging in a small amount of export business as a sideline to a fully committed international outlook in which all operations, including those in the home country of the firm, are treated essentially on the same basis. Indeed, in its present stage of transnationalism, a corporation does not consider any of its global strategies in terms of its value to a particular country. Thus, there remains an inherent conflict between the multinational firm and nationalism. A single conglomerate such as General Motors today sells in seventeen countries items whose total value exceeds the gross national product of Belgium. The same conglomerate in the United States will obviously fare differently in a power struggle with the U.S. government than in a contest with the government of Belgium. Such a corporation, with a work force of one million strong, would be supporting a dependent family population equal to the present size of a country like Denmark or Ireland. See John Fayerweather, "The Internationalization of Business," The Annals of the American Academy of Political and Social Science, CDIII (September, 1972), 1-11; and Shonfield, "Business in the Twenty-First Century," pp. 203-207.

of manufactured goods will come from 300 or so worldwide companies owned by shareholders from all the major countries.¹

The above description of the contemporary corporation is quite at odds with the sharp legal image in which it is usually held in accounting and other business-related disciplines, where the corporation is "an artificial being, invisible, intangible, and existing only in contemplation of law."² It is generally


seen and analyzed as "a device for marshalling the savings of individuals for productive purposes."¹ In its conduct of business, a corporation is not believed to differ functionally from the individual proprietorship. Its purpose, like theirs, is deemed to be that of making the most money for its owners.²

D. A Major Disciplinary Force in Society

In the thirties, Berle and Means pioneered the exploration into the economic realities of the corporate world. Since then, they have consistently maintained that the mid-twentieth century American capitalist system depended upon and revolved around the relatively few super-corporations.³ The role of these corporations


²Galbraith, The New Industrial State, pp. 82-84. The most outspoken economist on this theme is Friedman, who writes that in a free-enterprise economy, the corporate executive is an employee of the owners of the corporation. According to their desire, he should guide corporate activities so as to make as much money as possible while conforming to the basic rules of society, both those embodied in law and those embodied in ethical custom. See Milton Friedman, "The Social Responsibility of Business Is to Increase Its Profits," The Sunday Times Magazine, September 13, 1970, pp. 122-126. This argument is expanded in Milton Friedman, Capitalism and Freedom, Phoenix Books (Chicago: University of Chicago Press, 1962), chs. i and viii.

³See Adolf A. Berle, Jr., and Gardiner C. Means, The Modern Corporation and Private Property (rev. ed.; New York: Harcourt, Brace & World, Inc., 1968); and Adolf A. Berle, Jr., The Twentieth Century Capitalist Revolution (New York: Harcourt, Brace & World, Inc., 1954). However, the predominance of large corporations does not mean that there do not exist any smaller
is not purely economic, though to be so was indeed their primary function. Neither are they purely commercial organizations, although profit has been one of their major purposes. More than mere devices for producing goods and services, these corporations have become a rational instrument of the modern society.\(^1\)

In contrast to earlier societies, the modern society has placed a high moral value on rationality, effectiveness, and efficiency. As modern societal instruments, corporations feature scientific procedures, standardization, objective recruitment, impersonality, machine operations, and a tendency to demand complete

business enterprises. In fact, they do exist in large number. But to understand American capitalism, writes Papandreou, one must concentrate on its most advanced sector which is composed of the modern giant corporations. Galbraith similarly argues that in such matters our interest should be devoted to General Motors, Ford, and the like, rather than the local paving firm or body repair shop. See Papandreou, Man's Freedom, p. 30; and Galbraith, The New Industrial State, p. 84. See also Harris, "Galbraith, Solow and the Truth about Corporation," p. 40.

\(^1\) What is more, as Bell puts it, even in its inception the corporation was construed as a social invention to meet the novel problems of the day. It was conceived as an instrument of self-governance for groups carrying on a common activity, such as artisan guilds or local boroughs. In the case of the modern corporation, if we see it more as a bureaucratic structure of occupational roles and less as private property, its original sociological conception provides a useful perspective. Like a university, it is a self-selective, ongoing enterprise of its members, who seek to carry out its purposes with due regard for the interests of its community. See Daniel Bell, "The Corporation and Society in the 1970's," The Public Interest, Summer, 1971, pp. 29-30. See also Parsons, Structure and Process in Modern Societies, pp. 122-115; and Robert Maynard Hutchins, "The Administrator," in The Works of the Mind, ed. by R. B. Haywood (Chicago: University of Chicago Press, 1947), pp. 135-150.
loyalty from their members. By coordinating a large number of human actions, the corporate organization creates energy and performance vastly superior to what any individual, no matter how brilliant, can create.

In its process of human coordination, the corporation also puts together a powerful social structure. If the larger societal structure is a decisive force in molding individual behavior and personality, the big corporation can similarly be conceived as a small society whose characteristics of specialization, hierarchy, and authority have a similar influence upon its members. The mechanism that society employs to teach its various values may also be seen at work within the corporate organization, i.e., it socializes its members.

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In their efforts to rationalize and harness human energies toward structured goals, these organizations have become sensitive and versatile agencies for the control of human behavior, employing subtle psychological sanctions that evoke desired responses and inculcate consistent patterns of action. In this sense, the big corporations are a major disciplinary force in our society.¹ Their influence spills over the boundaries of economic interest and activities into the spiritual and intellectual sector. Moreover, the accepted values of the corporate organization shape the individual’s personality and influence his behavior in extra-vocational situations.²


²Presthus, The Organizational Society, pp. 15-16. However, Dahl and Lindblom justify these corporate attempts to indoctrinate its employee. Stable, persistent, and repetitive cooperation is impossible unless some of the responses of people who interact are more or less predictable by one another. See Dahl and Lindblom, Politics, Economics, and Welfare, p. 34. Some others have been alarmed at the thought of being a servant "in thought as in action, of the corporate organizational machine that we created to serve us." See Galbraith, The New Industrial State, p. 19. Most disturbing to some is the individual’s subordination to and dependence upon the organization. Boulding has analyzed this phenomenon in Kenneth B. Boulding, The Organizational Revolution: A Study in the Ethics of Economic Organization, Quadrangle Paperbacks (Chicago: Quadrangle Books, Inc., 1968).
B. The Corporate Image in Theory

The legal definition of the corporation is merely a loose framework that attempts to cover both the corner drugstore and General Motors, each of which just happens to be a corporation. We cannot describe and analyze the two meaningfully within the same framework, however, because corporations like General Motors are much more than their legal image. To some, the large modern corporation with its enormous power disenfranchises the stockholders, grows to gargantuan size, expands into wholly unrelated activities, and, in general, is monopolistic where it buys and sells.\(^1\)

The modern corporation, with its great size, variety of activity, and comprehensive effects, has blurred or even erased the traditional line of demarcation between what was held to be

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\(^1\) However, both Ladd and Suojanen think that accounting has followed this loose framework in performing its information function while reporting corporate activity to the society. They suggest that accountants should reexamine their basic role in our society and the way it is carried in light of the modern corporation realities. See Dwight R. Ladd, Contemporary Corporate Accounting and the Public (Homewood, Ill.: Richard D. Irwin, Inc., 1963); and Waino W. Suojanen, "Accounting Theory and the Large Corporation," The Accounting Review, XXIX (July, 1954), 391-398. The most cogent argument with an accounting perspective was developed more than a quarter century ago by Vatter. He wrote that the needs of corporate reporting could not be met by a general-purpose, overly simplified structure of accounting theory based upon the simple notion of proprietorship or entity. The uses of accounting information are manifold, and he further suggested that a need existed for a more objective and more fundamental approach to the problems of accounting theory and practice. William J. Vatter, The Fund Theory of Accounting and Its Implication for Financial Reports (Chicago: University of Chicago Press, 1947), pp. 3-13.

\(^2\) Galbraith, The New Industrial State, p. 84.
public and that which was private. The reality is that a new economic order has emerged which is characterized by very large industrial organizations that maintain economic order among themselves, and "between their interests and those of the government, by an even more nearly complete, albeit carefully camouflaged and stoutly denied network of planning."  

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*Heilbroner,* "Capitalism Without Tears," p. 17. This is how Heilbroner summarizes the basic theme of *The New Industrial State*, as conceived by Galbraith. Also, see Galbraith, *The New Industrial State*, ch. 1. To the extent that the Galbraithian theme implies erosion of market forces, competition, and the entrepreneurial zeal of profit-maximization, there are heated controversies. Jacoby, in particular, strongly disagrees, and suggests that Galbraith provides a distorted description of the structure and operation of one segment of the economy. See Neil Jacoby, "Professor Galbraith's 'New Industrial State,'" *California Management Review*, X (Spring, 1968), 91-94. Similarly, Scott,
The above realities of the corporate world go far beyond the ones envisioned in the studies which analyze the corporate organization as a homeostatic organism constantly adapting itself to its environment so that its capacity to function and its survival are assured. These studies view accounting as a form of inquiry for enabling such organisms to adapt themselves to mitigate the effects of their environment. The state of adaptation is considered to be a state of no-strain. Thus, the object of organizational action is said to be the substitution of a less strained or less uneasy condition for a more strained or more uneasy condition.¹

¹See Chambers, Accounting. Bvalu ation and Economic Behavior, pp. 20-21. The concept of homeostasis has been widely used in theory construction in most sciences to interpret the behavior in terms of some equilibrium state which the "individual" seeks to maintain. Any homeostatic mechanism requires the following elements. There must first be the datum—the object of stabilization. Secondly, there must be a transmitter of information from the receptor to an interpreter. There must also be a transmitter from the interpreter of the information to an effector, and a transmitter of the effect from the effector back to the datum. The homeostatic equilibrium characterizes what are called open systems which maintain a structure in the midst of some kind
The homeostatic model cannot explain achievement motivation—a necessary and powerful motivation among many top executives—which often becomes more intense as the objectives are achieved. On the individual level, the model hardly seems relevant to managerial behavior which is sensitive to accounting information. At the organizational level, the model falls short of abstracting the corporate reality.¹

Considerably beyond the adaptive process, the corporate mechanism almost invariably takes a variety of steps to prevent, offset, or otherwise neutralize the effects of an adverse environment. To ensure that what is foreseen in the planning process ultimately occurs in fact, the corporate organization shapes the environment to whatever extent it can. Too much is at stake—in terms of capital, organization, and technology—to rely on and adjust to the environment as reflected in the

of throughput of material. Many attempts have been made to integrate biological theory, and in particular the principle of homeostatic equilibrium, into the social sciences, because the social organization is considered an open system and maintains a homeostatic equilibrium. See Boulding, Beyond Economics, pp. 93-96; Boulding, Economics as a Science, pp. 1-22; Kenneth B. Boulding, "General System Theory--The Skeleton of Science," in Modern Systems Research for the Behavioral Scientist, ed. by Buckley, pp. 3-11; and Talcott Parsons, Sociological Theory and Modern Society (New York: Free Press, 1967), ch. 15.

vagaries of the market. The corporate organization tries to simplify and stabilize its environment. Thus, the significance of the homeostatic concept emerges in its mutuality of adaptation. There is always a mutual adaptation in the organism as well as in the environment in the attempt of each to suit the other.²


VI. DECISION-MAKING IN THE POST-INDUSTRIAL CORPORATION

A. The External Environment

Three particularly visible elements of the post-industrial society promise to give a new shape to the external environment of the corporation. They are: the exponential growth of science, the growth of intellectual technology, and the growth of research and development activities. It is contended that science-based technology and its concomitant social consequences have changed the shape and texture of the organizational environment, especially in the following three areas.¹

The Rate of Change is Accelerating At an Increasing Rate.--As an essentially stable economy transforms itself into one of violent technological flux, rapid obsolescence, and great uncertainty, trial and error must give way to an organized search for opportunities to make a major shift in the means of achieving organizational objectives.²

The Boundary Position of the Firm Is Changing.--The relationships between the manager and the following eight areas of relevant social activity have become more active and complicated: government, distributors and consumers, shareholders, competitors,

¹Warren G. Bennis, "Organizational Developments and the Fate of Bureaucracy," Industrial Management Review, VII (Spring, 1966), 41-50. Much of what follows is adapted from this and other writings of Bennis. Many of the references cited here were first found in his work and then traced to their original sources for further elaboration.

raw material and power suppliers, sources of upper level management employees, trade unions, and groups within the corporate organization.¹

The Causal Texture of the Environment Has Become Turbulent.--The field of forces surrounding the corporate structure constitutes a turbulent environment which contains the following characteristics:

1. The environment is a field of forces which contains the causal mechanisms and presents an important choice for the corporate organization.

2. The field is dynamic with increasing interdependencies among and between the eight social institutions specified above.

3. There is a deepening interdependence between the economic and other facts of society, which means that economic organizations are increasingly enmeshed in legislation and public regulation.

4. There is a growing reliance on research and development to achieve an advantage and a concomitant change gradient which is continuously felt in the environment field.

5. Maximizing cooperation rather than competition between organizations appears desirable because their fates may become basically positively correlated.²


²This is a summary of an environmental theme developed in F. E. Emery and E. L. Trist, "The Causal Texture of Organizational Environments," (paper read at the International Congress of Psychology, Washington, D. C., September, 1963). See Bennis,
The post-industrial external environment is increasingly differentiated, interdependent, and more salient to the corporation. Three main features of this environment are: interdependence rather than competition, turbulent rather than steady competition, and large rather than small corporate organizations. Shaped by the growth of science and technology, the texture of this environment holds a causal mechanism so rapidly changing and unpredictable that it presents an enormous challenge for those who manage the corporate organizations.¹

B. The Information and Decision System, and the Learning Process

The central task of the post-industrial society is the management of giant corporate organizations where tens of thousands of people, each doing his work according to his knowledge, produce a common tangible performance. What must they and others around them know to be able to direct their efforts toward the common end? What decisions have to be taken, when, and where? And how are they to be conveyed to all the people who have to act to make these decisions effective? A corporate organization is an information and decision system where information, ideas,

¹Bennis, "Organizational Development and the Fate of Bureaucracy," pp. 50-54.
and actions flow from and to the people, within and without.¹

The post-industrial corporation is an organization of the technostructure—the professionals of highly specialized knowledge exercising autonomous and responsible judgment who need information.² The amount, diversity, and ambiguity of the information beating in on the corporate decision-maker, however, is so overwhelming that one way to summarize what is new and different in the decision-making process is in terms of information.³

¹Peter F. Drucker, Landmarks of Tomorrow, pp. 91-92. This implies the importance and inevitability of an internal organizational structure that would assure efficient coordination of the flow of information and products, and permit the rational allocation of the financial, human, and technological resources of the firm. Indeed, America's business superiority lies in the capacity of its corporations to create and develop efficient internal organizations, and not in the resources of these corporations, however immense they may be. See Chandler, "The Role of Business in the United States," pp. 32-33; and Crozier, "A New Rationale for American Business," pp. 147-148.

²Bennis comments that today the survival of the firm depends, more than ever before, on the proper exploitation of brain power. See Bennis, "Organizational Developments and the Fate of Bureaucracy," p. 51. In this respect, it should be noted that Henry Ford resisted the brain power of professional management by shunning employees with specialized technical knowledge, and nearly ruined his company. Ford provides an interesting case study in the corporate power shift from an autocratic business magnate to the technostructure. See John Kenneth Galbraith, The Liberal Hour (New York: New American Library, 1964), pp. 117-137; and Peter F. Drucker, The Practice of Management (New York: Harper & Row, Publishers, 1954), pp. 111-120.

³Drucker, "Long Range Planning," p. 112. Simon similarly notes that we are now in the early stages of a technological revolution in the decision-making process. See Simon, The Shape of Automation for Men and Management, p. 40. Also, supporting this view, Bedford endorses a statement of a scientist at Arthur D. Little Company that in the seventies, one of the three major problems facing business and society will be a surplus of information that may engulf us all before we can do anything about the other two problems—pollution and a lack of energy resources. See Norton M. Bedford, "Information, Business and Society," p. 7.
The dilemma here is that a decision-maker has only a certain span of attention, and cannot hold more than a certain number of alternatives and related information in his mind.\(^1\)

An adequate decision-making system must include within it a learning process by which the image of the environment possessed by the decision-maker is capable of change. Each individual decision-maker has an image of the environment which includes an image of space, of time, of the past and future, of his role in that environment, of things that are expected of him, the things he expects of others, his obligations, his rights, and so on.

This image largely determines his behavior. If the decision-maker finds himself in situations where his behavior does not reinforce his image, then either his image must change or he will find himself in a new situation.\(^2\)

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\(^1\)Simon terms this the "bounded rationality" of man as a decision-maker. Man is limited by his unconscious skills, habits, and reflexes; by his values and conception of purpose, which may diverge from the organization's goals; and by the extent of his knowledge and information. Because of "bounded rationality," the decision-making should be centralized in the hands of experts who are more likely to make decisions that are rational from the point of view of the total system. According to Simon, the basic task of administration is to provide each operative employee with an environment of decisions of such a kind that behavior which is rational from the standpoint of this environment is also rational from the standpoint of group values and the group situation. See Herbert A. Simon, Administrative Behavior: A Study of Decision-Making Processes in Administrative Organization (2nd ed.; New York: Macmillan Company, 1959), pp. 135-140, 240-243. Also, see Dahl and Lindblom, Politics, Economics, and Welfare, pp. 57-64.

\(^2\)Kenneth B. Boulding, "The Relations of Economic, Political and Social Systems," Social and Economic Studies XI (December, 1962), 359-380. Because our image guides our behavior, Boulding writes elsewhere, we learn new things, not from successes, but from failures. For success, that is, the fulfillment of expectations, only confirms us in our image of the world as we already
The learning process must occupy an important place in any information and decision system. Perhaps the most significant occurrence in the entire history of mankind is the formalization and systematization of the learning process in science, for this has resulted in an enormous acceleration of change in the human image.\(^1\)

C. Accounting as an Information Feedback

A decision-oriented information system assists the decision-maker in finding the best out of various feasible alternatives by identifying some quantity which can serve as a measure of

have it, and though this may be important, it does not lead to any change in our image of the world, which is essential to learning. It is the failure of our expectations to be fulfilled which may force us into some kind of reorganization of our image of the world. See Kenneth B. Boulding, "The Crisis of the University," The Colorado Quarterly, XIX (Autumn, 1970), 125.

\(^1\) Kenneth B. Boulding, "Toward the Development of a Cultural Economics," Social Science Quarterly, LIII (September, 1972), 273-279; and Boulding, "The Relations of Economic, Political and Social Systems," pp. 359-360. Both Churchman and Boulding write that accounting as an information science lacks such a learning process. The typical income statement hides almost all the relevant information that should be collected if one is to learn from an organization's past. The real lessons to be learned are the lessons of the lost opportunities, the possibilities that were never actualized because the resources were used elsewhere. However, the accountant is primarily interested in the enterprise as it is now and as it has been in the past. He asks himself simply how profitable the enterprise is rather than how profitable it might have been if it had done something different. These lost opportunities are the cases that should be watched, but they are practically never described in the accounting statements. It is in this area that the management sciences have presented a challenge to accounting. See C. West Churchman, The System Approach, Delta Books (New York: Dell Publishing Company, 1968), p. 38; C. West Churchman, "The Management Sciences," Working Paper No. 1, Management Science Nucleus of the University of California at Berkeley, 1959. (Mimeographed); and Boulding, "Economics and Accounting," p. 285.
desirability, and then discovering what combination of other variables under his control will lead to the most advantageous situation.\(^1\) Accounting, as an information-feedback in such a system, serves a function which is not otherwise fulfilled.

In the larger business enterprises, due to the organizational and spatial distance and the complexity of internal relationships and effects, utility of the observational feedback is lost.\(^2\) In modern business affairs,

the things done are so numerous that only a small proportion of them comes under the notice of managers, and the experience of only that proportion is known to them. And none of them is known to investors and other outsiders. The effects of those and all other things must be brought together in some way which represents the whole experience of the firm. . . . Certainly what the firm might do in the future is of consequence. . . . But the discovery of what has occurred and of the resulting present position provides the major factual premises, of a financial kind, for speculation about the future. . . . We hold this process of discovery to be the prime function of accounting. If it is not done as well as possible, judgments about past and future lack that contact with the factual present which alone provides a trustworthy foundation for choice and action.\(^3\)

Decision-making, however, is an immediate and present

\(^1\)Boulding, *Economics as a Science*, pp. 05-07.

\(^2\)R. J. Chambers, "The Foundations of Financial Accounting," in *Berkeley Symposium on the Foundations of Financial Accounting* (Berkeley: Schools of Business Administration, University of California, 1967), p. 41. Similarly, nearly four hundred years ago in Venice, the merchant was advised on the virtues of accounting and asked not to rely upon his memory in his business dealings unless he was like King Cyrus, who knew each one of his numerous soldiers by name. See B. S. Yamee, "Scientific Book Keeping and the Rise of Capitalism," *The Economic History Review*, I (1949), 103.

\(^3\)Chambers, "The Commercial Foundations of Accounting Theory," p. 03.
process where a variety of time spans are synchronized. Not only the past and present states of the organization, but also their futurity as well are relevant inputs in the decision-making process. In relation to the futurity, the decision-maker is deciding about two different aspects of alternative images of the future—the images of the alternatives themselves, on the one hand, and the evaluations of those alternatives, on the other.

If an information system is to be relevant, either in the actual process of decision-making itself or in the creation of more realistic and complex images of the future, it must include a learning process. In its simplest form, learning is a process by which inputs of information about the past lead to images of the future in the present. However, the specific information which would enable a decision-maker to optimize the organizational objectives is not generally available to him. This is particularly true of economic decisions which are always made in the hope of the future, whereas the needed information is always derived from the past.

D. Decision-oriented Accounting Information

Accounting, as a part of the decision-oriented information system, should record the relevant information about the resource-utilization, including the lost opportunities, and should evaluate


these bits of information only in terms of their meaning to the user.\(^1\) Thus, the theme of much of the accounting research conducted during the sixties was its emphasis on the relationship of accounting information to the user's needs.\(^2\)

Moreover, the Committee of the American Accounting Association to Prepare a Statement of Basic Accounting Theory defined accounting as "the process of identifying, measuring, and communicating economic information to permit informed judgments and decisions by users of the information."\(^3\) It further stated that information systems are designed to serve the managers and others in carrying out the organizational objectives of entities in which profitability is not the sole or even an important objective, as well, of course, as of business entities. Economic considerations, broadly conceived, are of vital importance in planning action and controlling operations to achieve the planned objectives for all entities. The definition evaluates accounting primarily in its relevance to decision-making. The ultimate criterion is whether accounting as a language permits the substantive

\(^1\)This implies that the role of the accountant is viewed here both as an information collector and as an aid to the decision-maker. It is in this perspective that the potentialities rather than the actualities are most significant in the making of decisions. See C. West Churchman, "The Past's Future," in Foundations of Accounting Theory, ed. by Stone, pp. 145-148.


\(^3\)American Accounting Association, A Statement of Basic Accounting Theory, p. 1.
proposition that will facilitate decision-making.\(^1\)

Implicit in the above definition is one of the overriding goals of accounting: the establishment of a communication process.\(^2\) Accounting may be viewed as a system of the communication process. Such a process involves a determination of what information regarding a firm should be gathered and how it should be interpreted, as well as the selection of the best method of communication. Furthermore, the communication process should be evaluated by observing the types of information needed by the users of accounting reports and by determining the ability of such users to interpret the information properly.\(^3\)

Some writers have viewed the accounting function principally as the measurement and communication of economic data.\(^4\)

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\(^1\)Ibid., pp. 1-2. In this definition, reference to the economic information, though inevitable, may be construed as restrictive. Also, it does not adequately delineate boundaries of accounting in the sense that virtually all the disciplines can be viewed as providing a body of knowledge to act as a basis for informed judgment by man. See Report of the Committee on Accounting Theory Construction and Verification, Thomas W. Williams, chairman, The Accounting Review, Supplement, XLVI (1971), 62.


\(^4\)For example, see Herman W. Bevis, "The Accounting Function in Economic Progress," The Journal of Accountancy, CVI (August, 1958), 28; and Thomas R. Prince, Extension of the...
This means that accounting may deal only with the area of information which can be quantitatively measured. However, considering the realities of the post-industrial world—"that our world has become so complex, so big, so interrelated and yet so specialized"—where the need for varied kinds and levels of information is so important, it is imperative to expand the accounting function of measurement and communication. This implies that the technology underlying the accounting profession will also have to be expanded to deal with the increasing information needs.  

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2 Ibid., ch. 2. Similarly, Anthony suggests that accountants will be forced to precipitate and recognize the changes in their profession. See Robert N. Anthony, "Management Accounting for the Future," Sloan Management Review, XIII (Spring, 1972), 30-31.
VII. A PROFILE OF THE SOCIAL SYSTEM

Some writers assert that the concrete acts of human behavior provide the starting point for all social sciences. The interactional process of human behavior provides a focus of the social perspective, from which emerges the rudiments of the social system. An attempt is made in this chapter to briefly narrate the four-function Parsonian paradigm of the society and how it lends itself to the development of the corresponding four subsystems of the society. One of these subsystems is economy which, along with its functions and institutions, is discussed at length in the following two chapters.

A. The Systems Concept: The Holistic View

From the General Systems viewpoint, a system may be defined as "a set of components interacting with each other and a

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2 The scheme and description of the functional analysis of the society in this chapter and, based upon it, the functional subsystems of the society discussed in the next two chapters, have been substantially adapted from the works of Talcott Parsons. Parsons was the first and foremost among the American sociologists to analyze the society in a systemic way, and to provide the most comprehensive theoretical foundations in social research for the modern systems theorists. His lifework in this area has resulted in an enormous amount of writing, too much to be catalogued and referred to for the limited purposes of this study. Nonetheless, a general note of acknowledgement is made here. Specific footnotes in each instance show which particular work--his own or of those with whom he collaborated--has been used as the source material.
boundary which possesses the property of filtering both the kind and rate of flow of inputs and outputs to and from the system."¹

Functionally, in short, a system processes inputs and expels products which are noticeably different from inputs.

Within the hierarchy of an organization, this concept of a system can be applied to all levels. The concept can be applied to cells within a tissue, organs within an organism, companies within an industry, and nations within an alliance. Each of the levels of organization can be conceived as a system composed of subsystems in which relations between the subsystem components result in certain outputs that contribute to the larger system.²

Moreover, as a concept, a system refers both to a complex of interdependencies between the parts, components, and processes which involve discernible regularities of relationship, as well as to a similar type of interdependency between such a complex and its surrounding environment.³

Since the system concept deals with the whole, which functions as a whole by virtue of the interdependence of its parts,

¹F. Kenneth Berrien, General and Social Systems (New Brunswick, N. J.: Rutgers University Press, 1968), pp. 14-15. In this definition, Berrien thinks of a component as a unit of the system that, in combination with other units, functions to combine, separate, or compare the inputs to produce outputs. The boundary of a system separates the system from another as it filters inputs and outputs. And if inputs can be seen as energies absorbed by the system, then output energies are those which are expelled by the system as a consequence of its operations and are different in some significant way from inputs. Ibid., p. 32.

²Ibid., p. 15.

it provides a highly useful analytical tool around which all the sophisticated theory in the conceptually generalizing disciplines can be organized. Any regularity of relationship can be adequately understood if the whole complex of multiple interdependencies of which it forms a part is taken into account.¹

Many empirical phenomena present themselves in no other way but as a whole. The concept of the organism in biology, of the individual in psychology, the concepts of institution and social class in sociology, the concept of a nation in contemporary political science, of culture in anthropology—all of these present themselves as wholes and we perceive them as such. We recognize an individual or a nation, and we assume that in nearly all circumstances each of them acts as a whole.²

We must approach these and like phenomena in their

¹Ibid. Briefly, this is the scientific world-view of the modern systems theory which has replaced the concern for inherent substance, qualities, and properties with a central focus on the principles of organization per se regardless of what is being organized. A happy by-product of the last war effort, the modern systems approach draws its basic concepts from physical as well as biological sciences, and aims to replace the older analytic Laplacian technique with a more holistic orientation to the problems of complex organization. See Walter Buckley, Sociology and Modern Systems Theory, Prentice-Hall Sociology Series (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1967), pp. 30-40. Also, in the modern systems theory, Boulding sees the development of a general framework—"the generalized ears"—so that specialists from various fields can communicate with each other meaningfully. See Kenneth B. Boulding, "General System Theory--The Skeleton of Science," in Modern Systems Research for the Behavioral Scientist, ed. by Buckley, pp. 3-10. Both of Buckley's above works have been invaluable in developing this chapter, and many of the references that follow were initially found there and later traced to their original sources for elaboration.

²Anatol Rapoport, "Foreword," in Modern Systems Research for the Behavioral Scientist, ed. by Buckley, p. xvii.
entirety. The century-old strategy of varying a few selected factors is thoroughly inadequate when the complexity has reached its present proportions. The older analytical approach is inadequate when dealing with a complex system because it gives us only a vast number of separate parts or items of information, the results of whose interactions no one can predict.¹

B. Interdependence: The Fundamental Property

For methodological purposes we can distinguish a theoretical system from an empirical one. A theoretical system can be viewed as a complex of assumptions, concepts, and propositions having both logical integration and empirical reference. An empirical system is a set of phenomena in the observable world that can be described and analyzed by means of a theoretical system. It is never a totally concrete entity. Rather, it is a selective organization of those properties of the concrete entity which are seen as relevant to the theoretical system in question. For a social system to be a concrete entity, there should be "two or more people in interaction directed toward attaining a goal and guided by patterns of structured and shared symbols and expectations."² A social system thus may be envisioned as a system of


social action which persists.¹

As a theoretical system, the social system is specifically adapted to describing and analyzing social interaction. It centers on human social interaction, which is organized on the symbolic levels we describe as cultural. In this way, it also provides a primary link between the culture and the individual, both as a personality and as an organism. Since the social system as a theoretical system is concerned with behavior, the parts of a social system are not physical in nature. Rather, they are interactional and manifest themselves as processes of action and reaction.²

More generally, a social system can be viewed as a complex of elements or components directly or indirectly related in a causal network, such that each component is related to at least

¹Thus, for Parsons, the master example of the social system is society. The basis of any society is the interaction of a plurality of human beings with each other within the meaning-framework of a common culture. See Talcott Parsons, "Culture and Social Systems Revisited," Social Science Quarterly, LIII (September, 1972), 254. It is "the meaning-framework of a common culture" or "the patterns of structured and shared symbols and expectation" that makes it possible for men to generally predict each other's behavior. Thus, Wrong views society as "essentially a set of broadly warranted predictions made by its members about one another's behavior." See Dennis H. Wrong, "Introduction," in Max Weber, Makers of Modern Science Series, ed. by Dennis Wrong (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1970), p. 25.

²Parsons, "Systems Analysis: Social Systems," p. 459. Furthermore, in a social system, this interactional process is complementary in that the participants conform with each other's expectations. Here, "an alter's reaction to ego's actions are positive sanctions which serve to reinforce his given need-dispositions and thus to fulfill his given expectations." See Talcott Parsons, The Social System (New York: Free Press of Glencoe, Inc., 1951), pp. 204-205.
some others in a more or less stable way within any particular period of time. It is the web of relationships which ties the system together. In fact, whatever its form--mutual or unidirectional; linear, nonlinear or intermittent--it is the network of relationships which makes the notion of "system" useful. The components may be relatively simple or stable, or complex and changing; or they may vary in only one or two properties or take on many different states.¹ Thus:

The most general and fundamental property of a system is the interdependence of parts or variables. Interdependence consists in the existence of determinate relationships among the parts or variables as contrasted with randomness of variability. In other words, interdependence is order in the relationship among the components which enter into a system.²

The notion of interdependence in a system implies that consequences of actions by any one unit can be traced through the system and that ultimately these consequences feed back to the units initiating the change. The concept of the social system thus refers to the structural patterning of system parts in such a way that changes in one or more of them set up pressures for adjustment in the others. The basic criterion for establishing such a system is the existence of meaningful interdependence among the actions of these parts.³

¹Buckley, Sociology and Modern Systems Theory, p. 41.


³Talcott Parsons and Neil J. Smelser, Economy and Society:
C. The Social System as an Open System

Like all living systems, a social system is inherently an open system. That a system is open means, not simply that it engages in interchanges with the environment, but that this interchange is an essential factor underlying the system's viability, its reproductive ability or continuity, and its ability to change. The difference between open and closed systems is a matter of linkage with the outside environment. While closed systems are self-contained, the open systems accept and respond to outside inputs, such as information or energy.


Buckley, Sociology and Modern Systems Theory, p. 50.

The self-containment of the closed system, of course, is hypothetical. For analytical purposes, however, the mechanical systems, such as thermostatically controlled furnaces or air-conditioners, are generally classified as closed. See Alvin L. Bertrand, Social Organization: A General Systems and Role Theory Perspective (Philadelphia: F. A. Davis Company, 1972), p. 96.
The environment is basic in open systems; therefore, due to their information-processing capabilities the environmental interchange becomes selective and stable, and loses its randomness.\(^1\) In fact, the system and its environment make up sub-parts of a wider system which often must be treated on its own level.

As an open system, the social system engages in the processes of environmental interchange, that is, it has an input-output relationship with the environment. Labeling a system "open" also means that it is a part--i.e., a subsystem--of one or more superordinate systems. In this sense, it is interdependent with the other parts of the more comprehensive system and, hence, partly dependent on them for essential inputs.

From the inevitable fact of interdependency follows the concept of system-function as it applies to all living systems. The problems concerning the maintenance and development of the

\(^1\)This also provides the basic difference between the open and closed systems: the process of entropy, through which all forms of organization move toward less efficiency and death. It is unalterable in closed systems, while open systems are negentropic, that is, they have mechanisms to slow down or arrest this process. See \textit{ibid.}, p. 99; and L. Brillovin, "Life, Thermodynamics and Cybernetics," in \textit{Modern Systems Research for the Behavioral Scientist}, ed. by Buckley, pp. 147-150. Some economists have proposed that the concept of entropy should be brought into economic analysis to give it a dynamic and the sense of direction that an open system possesses. Economic processes, like evolutionary processes, are anti-entropic in the sense that they use free energy to create structures of increasing complexity. A lengthy and erudite expansion of this argument can be found in Nicholas Geogescu-Roegen, \textit{The Entropy Law and the Economic Process} (Cambridge: Harvard University Press, 1971). Also, see Boulding, \textit{Beyond Economics}, pp. 277-280; and Boulding, "Toward the Development of a Cultural Economics," pp. 280-281.
environmental interchange become the functional problems of the system. The functional significance, and indeed, the ultimate legitimacy of a system, can be ascertained by the simple criterion of the dysfunctional consequences of failure, deficit, or excess of an input to a receiving system. The "function is the only basis on which a theoretically systematic ordering of the structure of living systems is possible."\(^1\)

D. The Functional Imperatives of the Social System

1. The Function of Pattern-Maintenance

The biological concept of homeostasis suggests that the social system maintains an equilibrium within certain boundaries relative to the environment, and that the functional imperatives of the system follow from such an equilibrium. The system has a tendency toward self-maintenance, which follows from the concept of equilibrium.\(^2\)

\(^1\)Parsons, "Systems Analysis: Social Systems," p. 460. For example, asphyxiation is the consequence of failure in oxygen input. On the functional criterion, the oxygen input is thus judged to be significant for the organism. Ibid. Likewise, Bedford suggests that the legitimacy of accounting as a profession should be judged on its functional contribution to the society. See Bedford, The Future of Accounting in a Changing Society, pp. 9-11. Chambers also chooses to define accounting functionally, and refers to Churchman's notion of a functional definition which makes explicit the usefulness of the concept for certain purposes. That is, "one way of accomplishing this explication is to make clear what activities or things are denoted by the concept and what purposes these activities (or things) serve." See Chambers, Accounting, Evaluation and Economic Behavior, p. 99; and C. West Churchman, Prediction and Optimal Decision: Philosophical Issues of a Science of Values, Prentice-Hall International Series in Management (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1961), pp. 96-97.

\(^2\)Parsons and Shils, "Values, Motives, and the Systems of
A social system is always characterized by an institutionalized value system. To maintain equilibrium in the system's environmental interchange—that is, to assure the continuing existence of the system—the social system's first functional imperative is to maintain the integrity of the value system and its institutionalization. This first functional imperative may be referred to as "pattern-maintenance and tension-management" because it relates to the stability of the institutionalized value system.1

There are two primary sources from which pressures to change the value system—pressure toward destabilization—originate:

(1) Cultural sources of change. Certain imperatives of cultural consistency may mean that cultural changes taking place outside the value system relevant to the social system in question (e.g., changes in the belief system) may generate pressures to change important values within the social system. The tendency to stabilize the system in the face of pressures to change institutionalized values through cultural channels may be called the "pattern maintenance" function.

(2) Motivational sources of change. Motivational "tensions," arising from "strains" in any part of the social situation or from organic or other intra-personal sources, may threaten individual motivation to conformity with institutionalized role expectations. Stabilization against this potential source of change

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1 Parsons and Smelser, Economy and Society, pp. 15-20.
may be called "tension management."\textsuperscript{1}

More generally, a social system's function of pattern maintenance has reference to the survival imperative of maintaining the stability of patterns of institutionalized culture, which defines the very structure of the system. Consequently, because of this set of functional exigencies, social systems show a tendency to preserve their structural patterns through maintaining their value-systems.\textsuperscript{2}

2. The Function of Goal-Attainment

While institutionalized cultural patterns of the social system are relatively constant, there is a great deal of variability in the system's relation to its environmental situation from time to time. Since every social system functions in a situation defined as external to it, the process of interchange between system and situation provides the functional imperatives of goal-attainment and adaptation of the environment for the purposes of attaining goal states.

A goal state for the social system is a "relation between the system of reference and one or more situational objects which (given the value system and its institutionalization) maximizes the stability of the system."\textsuperscript{3} Thus a goal can be seen, in terms

\textsuperscript{1}Ibid., p. 17.


\textsuperscript{3}Parsons and Smelser, \textit{Economy and Society}, p. 17. However, it should be remembered that for a social system the focus of its goal-orientation lies in its relation as a system to the personalities of the participating individuals. Motivation to contribute is necessary for the functioning of the system. See Talcott
of equilibrium, as a directional change to reconcile the differing needs of the system and its environment.

The social system and its various components are always trying to seek a situation closely synchronized with the processes of the system, and after achieving such a situation, continually try to maintain it. However, such a state of close synchronization where goal-attaining processes are explicitly intended to fulfill the functional requirements is rare. More generally, if we think of pattern-maintenance in terms of inertia, as used in the theory of mechanics, goal-attainment can be viewed as a problem insofar as some discrepancy arises between the inertial tendencies of the system and the demands of environmental interchanges.¹

3. The Function of Adaptation

The maintenance of an established state in a social system in terms of its institutionalized values and patterns is nonproblematic. There is a perennial tendency to self-maintain. However, the social system's environmental interchange is always problematic. There is a generalized interest in establishing and improving control over the situation in various respects, because order is the first of the functional imperatives of the social system.²

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The adaptive function of the social system is defined as the provision of facilities when they are scarce, while the goals to which such facilities can be put are many. With the plurality of goals, the same scarce facilities will have alternative uses within the system of goals. Here the problem of opportunity cost arises, because the use of scarce facilities for one purpose means sacrificing the gains that would have been derived from their use for another.

The most obvious fields of application of the adaptation function are the economic and technological, and its governing principle is the desirability of efficient management of resources. In modern societies, where relevant standards of rationality are generally approved, the action of an individual or a group will be disapproved if it is unnecessarily wasteful or careless even where the larger issues of collective loyalty, binding obligations, and morality are not involved.¹

4. The Function of Integration

Almost all systems are differentiated and segmented into relatively independent units which may be mutually supportive and hence beneficial to the functioning of the system. They may also be mutually obstructive and conflicting. Thus, the fourth functional imperative for a social system is to maintain solidarity in the relations between the units in the interest of effective functioning. This is the imperative of system integration.²

¹Parsons, The System of Modern Societies, p. 17
²Parsons and Smelser, Economy and Society, p. 18.
The functional problem of integration concerns the mutual adjustments of these units from the point of view of their contributions to the effective functioning of the system as a whole. This, in turn, concerns their relation to the pattern maintenance problem, as well as to the external situation through processes of goal-attainment and adaptation.

A social system is a complex network of interpenetrating structures and structural loyalties, a system characterized by both functional differentiation and segmentation. The primary consequence of the integrative function is to define the obligation of loyalty to the society, both for the membership as a whole and for various categories of differentiated status and role within the society. In analyzing any social system, the problems concerning the integrative function occupy the central core, because it is the focus of the most distinctive properties and processes of the social system.

B. The Functional Subsystems of Society

From the above analysis it can be seen that total societies tend to differentiate into subsystems which are specialized in each of the four primary functions. The four fundamental system-

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2 Society as a whole has been viewed here as a social system characterized by the highest level of self-sufficiency relative to its environment. As far as the physical environment is concerned, society allocates access to the physical resources and exploits them through the technological mechanisms. A society can be self-sufficient only insofar as it is generally able to count on its members' performances to contribute adequately to the societal functioning. See Parsons, The System of Modern Societies, pp. 8-9.
functions with which a social system operates are: pattern-maintenance and tension-management, goal-attainment, adaptation, and integration. Whereas the concrete structure of these functions cannot always be identified, it is often possible to isolate types of processes which are thus specialized. These functions are schematically represented in Figure 4.

Any social system can be described and its processes analyzed in terms of these four fundamental categories. We can also use this functional differentiation to treat a society as analytically divisible into four primary subsystems, as shown in Figures 5 and 6. As these illustrations show, the pattern-maintenance subsystem is particularly concerned with the relations of the society to the cultural system and, through it, to the ultimate reality. The goal-attainment subsystem or the polity is related to the personalities of individual members; the adaptive subsystem, or the economy, to the behavioral organism, and through it, to the physical world; and finally, the integrative subsystem or the societal community is related to the integration of all subsystems in a functioning whole. The following is a brief description of these subsystems.

1. Economy: The Adaptive Subsystem

The economy is the primary subsystem which specializes in the adaptive function of society. Economists seem to agree that the paramount goal of economic activity—and therefore of

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1 This discussion of the subsystems of society has been largely drawn from Parsons and Smelser, *Economy and Society*, pp. 40-09.
FIGURE 4
THE FUNCTIONAL IMPERATIVES OF SOCIAL SYSTEM
AS A SYSTEM OF ACTION

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<th>PATTERN MAINTENANCE AND TENSION MANAGEMENT</th>
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<td>AND DRAIN-OFF</td>
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FIGURE 5

THE DIFFERENTIATED SUBSYSTEMS OF SOCIETY, I

Source: Parsons and Smelser, Economy and Society, p. 53.
FIGURE 6

THE DIFFERENTIATED SUBSYSTEMS OF SOCIETY, II

<table>
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<th>SUBSYSTEMS</th>
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</table>

Source: Adapted from Parsons, *The System of Modern Societies*, p. 11.
an economy as a functional subsystem of the society—is best defined as production. However, production as an economic activity has been generally defined in physical terms: production of goods and services, numbers of automobiles, tons of coal, etc.

1For example, dealing with the problems of economic organization in his famous textbook, Samuelson suggests that every society must somehow confront three fundamental and interdependent economic problems: (1) What commodities shall be produced and what quantities? That is, how much and which of alternative goods and services shall be produced? (2) How shall goods be produced? That is, by whom and with what technological manner are they to be produced? (3) For whom shall goods be produced? That is, who is to enjoy and get the benefits of the goods and services provided? These three questions are fundamental to all economies, but different economic systems try to solve them differently. See Paul A. Samuelson, Economics: An Introduction (8th ed.; New York: McGraw-Hill Book Company, 1970), pp. 15-10. It should be noted here that traditional economic theory, more explicitly that derived from John Stuart Mill, has made a distinction between two types of economic problems: those of production and those of distribution. Some writers, like Myrdal, have considered this distinction illogical. They think that production and distribution are interrelated within the same macrosystem. See Gunnar Myrdal, "Response to Introduction," The American Economic Review, Papers and Proceedings, LXII (May, 1972), 458.

2The focus of interest in economics is so dominated by the commodity that Boulding calls it the study of the "no-person group." Traditional economics is not interested in human behavior as such; it is interested in the behavior of commodities. In reality, however, there is a subtle reason for such attention on commodities. The commodity prices, and other statistical and abstract measures with which economists deal, are, in fact, the result of human behavior, which indeed is not regular enough to be predictable. In economics, however, as in other social sciences, "the further they get away from people the more abstract they become and the more scientific they look." See Boulding, Economics as a Science, p. 74; and Kenneth E. Boulding, Religious Perspectives of College Teaching in Economics (New Haven, Conn.: Edward Hazen Foundation, n.d.), p. 20. In the same vein, Wiles suggests that economics stands at the point of man's interaction with nature, not with other men. Its powers of prediction derive from the inanimate side of its subject matter, which he calls the "logic of commodities": increasing returns to scale, diminishing returns, the fact of scarcity, and all that. He further writes that it is hardly a social science, for the sectors in which it has made the greatest advances are precisely those least concerned
physical notion is inadequate because the concept of production defines the goal-orientation of an economy only when the production is of goods and services insofar as they satisfy wants. Thus, maximizing utility or the economic value of the total available means to want-satisfaction defines the system-goal of an economy.

In defining the whole complex of economic activity--the production of wealth and income--the focal point of reference is the society as a system. The goal of economy as a subsystem is to maximize production relative to the whole complex of institutionalized value systems and functions of the society and its subsystems. The goal of the economy is viewed here as defined strictly by socially structured larger goals.

2. Polity: The Goal-attainment Subsystem

The goal of the economy is to produce generalized facilities as means to an indefinite number of possible uses. The goal of the polity is to mobilize the necessary prerequisites for the attainment of given system-goals of the society, that is, to maximize the capacity of the society to attain its system goals.1 This

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1 This phenomenon has been treated here as political because it involves the organization and mobilization of resources for the attainment of the goals of the society. Thus, the business organizations, universities, churches, etc. have political aspects. In
capacity can be seen as the power to make—and "make stick"—
decisions which are binding on the system and its members insofar
as they carry obligations under the decisions.

The more highly differentiated a society, the more likely
a necessity exists to utilize the power. No large or complex
system can endure unless compliance with the large parts of its
normative order is binding. Thus, the negative sanctions are
applied to deal with the noncompliance of that order. Tendencies
to deviate, to depart from conformity with the normative order on
the part of some subsystem or members, present the social system
with "problems" of control. If such tendencies are tolerated, they
will tend to change or disintegrate the system.1

3. Societal Community: The Integrative Subsystem

The most general function of a societal community as a
subsystem is to articulate a system of norms with a collective
organization that has unity and cohesiveness.2 Societal order
requires clear and definite integration in terms of normative

Modern Western societies, at least, the government has increasing-
ly become differentiated from the societal community (discussed
here as the next system) as a specialized organ of society.
Government is at the core of polity, but the functions of the
latter are not always coextensive with the governmental structure.
Therefore, the term "polity" rather than "government" is used for
this subsystem. See Parsons, The System of Modern Societies, p. 16.

1 Parsons and Smelser, Economy and Society, p. 17. Also,
see Parsons, The Social System, p. 206; and Parsons, "An Outline
of the Social System," p. 53.

2 Weber refers to this normative aspect as the system of
legitimate order. See Max Weber, The Theory of Social and Econom-
ic Organization, trans. by A. M. Henderson and Talcott Parsons,
coherence to achieve societal harmony and coordination. The latter are achieved by defining the loyalty of the membership to the total system as such.

The societal community provides the core structure of a society because it is the collective structure in which the members form the inevitable union. Its most important property is what Durkheim called the "solidarity" which characterizes the relations among its members.¹ "The solidarity of a community is essentially the degree to which (and the ways in which) its collective interest can be expected to prevail over the unit interests of its members wherever the two conflict."²

Such demands of loyalty are met through the institutionalization of a value-system where the system of norms governing the loyalty integrates the rights and obligations of various members, not only with each other but also with the bases of legitimation of the social order as a whole.³ Thus, the integrative subsystem


²Parsons, "Systems Analysis: Social Systems," p. 401. This also dramatizes the differences between the societal community and other subsystems, such as economy. Boulding illustrates this by making a harping reference to the late President Kennedy's exhortation: "Ask not what your country can do for you, ask only what you can do for your country." If we contrast this, he says, with the calling, "Ask not what General Motors can do for you, ask only what you can do for General Motors," the difference is instantly dramatized between an organization with a strong integrative system, such as the nation-state, and an organization which is almost purely within the exchange system, such as a corporation. See Boulding, "Technology and the Love-Hate System," p. 43.

³Robert N. Bellah, "Epilogue," in Religion and Progress
of the society relates the cultural value-patterns to the motivational structure of individuals in order that the larger social system can function without undue internal conflict and other failures of coordination.

4. Culture: The Pattern-Maintenance Subsystem

The pattern-maintenance subsystem focuses on the institutionalized culture which, in turn, centers on the patterns of value orientation. Inevitable and more nearly constant though these value-patterns are, they are never automatic. In fact, the culture subsystem concerns itself with the comprehensive process of institutionalization of the participants so that they are motivationally committed to act in accordance with the normative patterns. The imperative here is to maintain the stability of the patterns of institutionalized culture, which define the structure of the system.

The process of institutionalization, however, ultimately faces the problem of socialization of the individual, that is, how to internalize the values of the society in the personality of the individual, where commitments involved are subject to differing kinds of strain.\(^1\) This would lead to another functional imperative of the subsystem, which is "tension-management." Pattern-maintenance and tension-management differ from the integrative

problem in the sense that they focus on the unit of the system, not on the system itself. Integration is the problem of inter-unit relationships, while pattern-maintenance is the problem of intra-unit states and processes.
VIII. ECONOMY, SOCIETY, AND THE SOCIAL EXPLANATION OF ECONOMIC BEHAVIOR

A. The Economy and Its Environment

The four primary functional subsystems of society—the economy, the polity, the societal-community, and the culture—are shown in Figures 5 and 6. These analytical divisions are clear and important for societies which are in their industrial or post-industrial stages. However, the complexity of relationships among the subsystems prevents these divisions from being precise.¹

From the point of any one subsystem, its primary environment consists of the other three. For the economy, the primary environment would consist of the polity, the societal community, and the culture. Analyzing the economy as a social subsystem surrounded by the rest of society, we can locate the noneconomic, i.e., the larger social origins and consequences of economic activity.²


²In this perspective, it is impossible to think of economic development purely in economic terms. Thus, a United Nations report suggests that economic progress is possible only when the total societal atmosphere is favorable to it. That is, the people of a country must desire progress, and their social, economic, legal, and political institutions must be favorable to it. This would imply, as Heilbroner suggests, that economic development is nothing less than the transformation of an entire society, as already exemplified in the creation of modern Western capitalism. See United Nations, Measures for the Economic Development of the Under-Developed Countries (New York: United Nations, 1951), p. 13; and Heilbroner, The Making of Economic Society, pp. 207-221. In a similar vein, it is also argued that the reasons for economic
Economic function involves the production and allocation of disposable resources. It is exercised only when limited resources are a means to alternative ends. Thus, for the economy, the functional problem is to determine what proportion of the society's resources will be made available for a variety of uses in economic production.

The economy accomplishes this task primarily through exchange and with the institutions of exchange. This is a different view of economy than that which describes it as a social subsystem concerned merely with the allocation of scarce resources. The allocation of scarce resources is the total societal function, and should not be confined to the economy alone. Scarce resources can be allocated through threat, as in slavery, or through the

backwardness are largely attributable to different attitudes, to different social and political institutions, and to historical experiences. These areas of discourse are beyond the economists' specialization, and are, therefore, resistant to the treatment of economists. Thus, Postan writes, "It is difficult to see how and in what form economists, qua economists, can contribute to the historical study of economic growth." See M. M. Postan, Fact and Relevance: Essays on Historical Method (Cambridge, England: Cambridge University Press, 1971), p. 68. Also, see P. T. Bauer, Dissent on Development: Studies and Debates in Development Economics (Cambridge: Harvard University Press, 1973). It should be noted here that traditional economic and accounting analyses, by their very insistence on dealing only with the quantifiable elements, are inevitably and unwittingly trying to wrench the economy out of the larger society. Heilbroner considers this an intrinsically self-defeating operation, because it distorts and misrepresents the activities it seeks to explain. Furthermore, "the economic variables cannot be excised from the larger social system in which they are embedded and treated as a microcosm of that system without seriously distorting the relation of the model to reality," See Robert L. Heilbroner, "The Limited Relevance of Economics," The Public Interest, Fall, 1970, p. 89.
development of integrative relationships, as in a family situation.  

A boundary-interchange is involved in the process of exchange. That is, if we view the economy as a differentiated subsystem of the total society, then such a subsystem is subject to particular and determinate types of boundary-interchange with the rest of the society and with the physical environment. The functional elements of economic activity—factors of production on the one hand and shares of income on the other—can be identified as the appropriate inputs and outputs, respectively, over these boundaries.

B. Factors of Production: A Case in Boundary-interchange

The supply of factors of production is an important economic activity and involves many boundary-interchanges since they are the input-categories into the economy. As a case in point, the following can be identified as boundary-interchanges

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involved in the supply of factors of production.¹

There is a boundary process concerned with the determination of who gets which factors at what cost. More particularly, there is an input of capital into the economy and a return to those who decide to relinquish resources which they control from alternative uses. This directly concerns capital markets and the relations between capital, interest, and related variables.

Institutions such as higher education and science specialize in providing knowledge and technology at one boundary of the economy which concerns itself with physical as well as cultural and motivational resources, the supply of which is not contingent upon short-term economic sanctions.² Rather, it is governed by an institutionalized system of values.³ At another boundary, household and educational institutions supply labor—motivated and skilled individuals.

¹See Smelser, The Sociology of Economic Life, p. 36.


³McClelland suggests that specialized skill and scientific expertise are achieved through the achievement-motive which is inculcated in the cultural and institutional arrangements of the society. In his comparative studies of the achievement-motive as acquired in various societies, past and present, he reinforces the institutional origins of individual accomplishments. See David C. McClelland, The Achieving Society (Princeton, N. J.: D. Van Nostrand & Co., 1961).
The fourth boundary concerns the integration of the economy, where available resources are organized in the productive process. The individual entrepreneurs, corporate organizations, and government agencies provide the functional elements of this integration for the long-term apportioning of resources in accordance with production opportunities.1

C. Imperatives of the Interchange

The economy achieves these boundary interchanges through the institutional complex of contract, property, the employment-occupation system, etc.2 The solidarity of the system is maintained by keeping its transactions in line with certain integrative imperatives, e.g., by protecting the interests of the parties to contractual relations. Following are the types of social controls which protect the boundary-interchanges between the economy and other subsystems:

1. Economic rewards and deprivations. This refers to the system of wages, salaries, and profits that can be employed in determining the role distribution in a society, the recruitment of individuals into

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these roles, and the degree of effort elicited within these roles.

2. Political measures. These include physical coercion, the threat of coercion, influence, bargaining, the promise of political power, and so on.

3. Integrative measures. One focus of integrative pressure is particularism, or membership in some ascriptive group. . . . Group membership may also be important for controlling a person once he has assumed a role. The key feature of particularistic sanctions of this sort is that the sanctioner appeals to the integrative ties (membership) of the actor in question. . . .

4. Value commitments. In this case commitment to fundamental principles is the lever that is used to induce individuals to enter roles and behave in certain ways once in them. Specific areas in which fundamental values operate as sanctions are in religious doctrine, nationalism, anticolonialism, socialism and communism, or any combination of these. ¹

Through all the boundary-interchanges, the economy forces the societal community to relate to the physical environment. More generally, we conceive of the economy as the functional subsystem of a society which specializes in producing and allocating fluidly disposable resources within the society.

The economy's integration of factors of production, physical as well as nonphysical--e.g., land, labor, capital, and organization--is ostensibly to produce goods and services. The socioeconomic element in economic activities is not the physical objects or physical behavior involved, as such, but rather certain ways of controlling them: in the case of goods, essentially by property rights; in the case of services, by the kind of authority or power over the performer that we associate with the

¹Smelser, The Sociology of Economic Life, p. 38.
status of employer.¹

Thus, the subject of economy in general and of the economic aspect of human behavior in particular should not be approached in terms of the classification of objects or things. It is not the concrete object, the "thing" as such, tangible or intangible, which is the basis of the interest in appropriation. Rather, it is the use to which it can be put. It is not the "things" which are appropriated but the rights to them. The economic order is much more than a mere functionally related mechanism for the generation and allocation of goods and services. It is also an inextricable mechanism for the generation of rights, power and privileges, life-style and motives.²


²This is the essence of the Weberian approach to the economy. See Weber, The Theory of Social and Economic Organization, pp. 41, 238-245. This is also where models of traditional economic theory have failed, because, as Heilbroner suggests, they do not see that the social universe which they are attempting to reproduce in a set of equations is not and cannot be adequately described by functional relationships alone, but must also and simultaneously be described as a system of privilege. See Heilbroner, Between Capitalism and Socialism, p. 122; and Heilbroner, "The Limited Relevance of Economics," p. 89. Similarly, Hyde argues that traditional economic theory analyzes the consumers and entrepreneurs not as flesh and blood people in all their unimaginable complexity, nor even as inanimate objects and materials with the wealth of physical and chemical characteristics we can discern in them, but as mere chess pieces with artificial powers, desires, and reactive propensities tied around their necks by the economist. The important question here is how valid are these analyses. For Hyde, these analyses have relevance only insofar as the economist makes a successful selection, hitting on just those elements in his picture of the real world which are indeed the key to its working. However, this is a function of social imagination rather than of technical specialization, which is so much a characteristic of modern economics. See Francis E. Hyde and others, A New Prospect for Economics, ed. by G.L.S. Shackle (Liverpool, England: Liverpool University Press, 1963), pp. 3-24, 479-492.
D. Indivisibility of the Social Process

A question of fundamental importance in the analysis of economic activity is that of the motives that prompt the participation of individuals as well as the organization, and the ends they pursue. The most enduring postulate of traditional economic theory suggests that men are rational and self-interested, and are devoted to the efficient pursuit of their ends. However, disputes concerning the importance of economic motives or financial incentives abound in contemporary motivational literature.¹

The themes of economic man and his economic rationality are generally understood in this way: if an individual is presented with a choice in an economic setting, he will behave so as to maximize his position. One of the most famous models in economics—the model of marginal analysis—concerns the prediction of the quantity of a given commodity that an individual firm will produce under conditions of perfect competition. The model is primarily derived from the theme of economic rationality.²

¹Moore, Economy and Society, p. 16.

²Smelser, The Sociology of Economic Life, p. 20. Smelser further notes that the postulate of maximization has had many intellectual variations and refinements in the history of economic thought. In the classical tradition of Ricardo and Mills, the postulate took the form of an application of the utilitarian principle of hedonistic calculus; in the several decades thereafter, there was a predominance of the utility theory of Jevons, who thought of economics as a "mechanics of utility and self-interest"; and in modern times the indifference curve analysts have attempted to iron out some of the difficulties of the earlier versions. Ibid. It should be noted that in its most general sense the theory of maximizing behavior is a tautology. It simply says that people do what they think is best at the time. Moreover, the theory of maximizing behavior and traditional marginal analysis tend to assume that the decision-makers possess required
The outstanding discovery of past as well as current behavioral and anthropological research, however, is that man's economy, as a rule, is submerged in his social relationships. Man does not act primarily to safeguard his individual economic interests in the possession of material goods. Rather, he acts to safeguard his social standing, his social claims, and his social assets. He values material goods and monetary rewards only insofar as they serve this end. Neither the process of production nor that of distribution is linked to specific economic interests attached to the possession of goods, but every single step in each process is geared to a number of social interests which eventually ensure that the required steps will be taken. Of course, these interests in a small hunting or fishing community will be entirely different from those in an industrial or a post-industrial society, but in general, the economic system will be run on noneconomic motives. The facts decision-making information. However, as Boulding suggests, the lack of required information is often the really critical problem, which the decision-makers alleviate mostly by trial and error. See Boulding, Economics as a Science, pp. 61-70. Similarly, Anthony writes that the information necessary to achieve profit maximization which the economist assumes obtainable is indeed rarely available to businessmen. See Robert N. Anthony, "Management Accounting for the Future," Sloan Management Review, XIII (Spring, 1972), 21. Furthermore, Anthony writes elsewhere that profit maximization is not a valid assumption to explain how business actually behaves because it is too difficult to achieve. See Robert N. Anthony, "The Trouble with Profit Maximization," Harvard Business Review, XXXVIII (November-December, 1960), 120-134. For some empirical evidence on the Anthony hypothesis, see John R. Meyer and Edwin Kuh, The Investment Decision, An Empirical Study (Cambridge: Harvard University Press, 1957).

1Karl Polanyi, The Great Transformation (Boston: Beacon
are never exclusively or purely economic; other—and often more important— aspects always exist, because the social process is really one indivisible whole.¹

¹Schumpeter, The Theory of Economic Development, p. 3.
B. Economic Rationality as an Institutionalized Value

It is only when we take the perspective of the society as an indivisible whole that we realize that human behavior in its economic aspect is not an act of economic rationality. Rather, it is "an act of balancing alternative and often conflicting independent human objectives in the face of the changing range of alternatives men perceive to be open to them."¹

Men seek not merely economic advantage, but personal and national power as well; not merely the adventure, but security and continuity of social and cultural experience; and not merely personal expression, but the joys of family and friendship. This view of the human condition—a view which regards man as a complex household rather than a maximizing unit—leads to a succession of patterns of choice behavior. However, these patterns vary in their balance, which is generally made within the framework permitted by the changing setting of society, a setting which is the product of both objective material conditions and of the prior choices made by men.²

¹Rostow, The Process of Economic Growth, p. 330. This is Rostow's answer—his famous "non-communist manifesto"—to Marx. From this view of how individuals act, he suggests that the performance of societies is not uniquely determined by the locus of property-ownership or by the nature of the production technique as conceived in the Marxian scheme. Rather, the sectoral interaction in society is mutual, and all sectors have their own authentic impact on the evolution of societies, including their economic evolution. Noneconomic sectors are not, as Marx suggested, a superstructure derived from the economy. Ibid. Also, see W. W. Rostow, The Stages of Economic Growth: A Non-Communist Manifesto (Cambridge, England: Cambridge University Press, 1963), for further elaboration of this theme.

As we already have seen in our analysis of the boundary-interchange, various subsystems of the society interact. Culture, societal community, polity, and economy: each reflects different facets of human aspiration, and each has its own authentic impact on the total human behavior. Thus, human behavior is characterized by the interplay of many noneconomic variables. How, then, do we reconcile the existence of economic rationality, if any, in at least the economic aspect of human behavior? Moore provides an admirable perspective on the economic aspects of human behavior in the following brief description:

1. The behavior of economic man may in fact be approximated within fairly narrow sectors of the social order, and oriented toward ends that by definition in the particular social order are self-interested.

2. The concrete behavior of the social individual, including that of the businessman or laborer in an economic context, is likely to include elements of irrational and non-rational behavior, capable of being understood within the broader framework of the normative order of society.

3. Socially effective motives are in fact primarily of social origin, inculcated through socialization of the young, and usually consistent with the ultimate values held in the society.

4. The approved and market-sanctioned acquisitiveness, characteristic of industrial capitalism, has in fact had its greatest extension in that economic order, and, in its particular qualities and degree, cannot be regarded as a universal principle of human motivation.¹

¹In the West, material comfort, progress, efficiency, and security have been the principal value orientation which strongly helped the institutionalization of the acquisitive characteristics of industrial capitalism. For example, some believe that "material comfort, and its cohort income, is probably the most famous value orientation attributed to the American system." See
5. The very real economic rationality to be found, for example, in primitive and peasant societies is oriented toward somewhat different goals and is limited by widely varying institutional contexts.

6. It is a serious mistake to equate economic incentives with materialistic goals. Man does not live by bread alone, but in a highly developed market system, money does not buy bread alone. The efficacy of financial incentives is likely to be proportional to the range of individual and group interests and values that can be satisfied through the use of money. With the steady extension of the market to include all sorts of services formerly performed on the basis of kinship obligations or neighborly reciprocity, monetary incentives are of growing importance in modern societies.

7. The previous point is not at all negated by increased interest in non-economic aspects of human behavior and motivation in an economic context (the factory, office, store). In most social situations, even at the market or workplace, the individual does not choose between economic and non-economic goals or incentives. Many interests may be served concurrently and customarily are.1

Analyzed from this perspective, economic rationality becomes an institutionalized value. More than a mere psychological postulate, it now becomes a standard of behavior to which people can conform or from which they deviate. This provides the social meaning of man's economic behavior.2 In this

Lowry Nelson, Charles E. Ramsey, and Coolie Verner, Community Structure and Change (New York: Macmillan Company, 1960), p. 106. However, these sociologists further suggest that it was not at all certain if material comfort was a universal goal or one that is easily aroused everywhere. Ibid. Similar suggestions also have been made by Bauer, who has developed this theme of differences that exist in a variety of people and what imperatives they provide for the strategy of economic development. See Bauer, Dissent on Development. (This footnote is added here.)

1Moore, Economy and Society, pp. 16-18.

2Smelser, The Sociology of Economic Life, pp. 34-35. Over the years, the concept of economic rationality has evolved
context, it also becomes one of the powerful weapons in the armory of social control.

The impact of institutional conditions now becomes more evident. They function to integrate the isolated economic act or the particular economic organization into the fabric of the normative order of society. The institutions so define the situation that self-interested action also fulfills the expectations of society. It is the institutional framework of economic systems and of the motivations of the participants that sets a formal analysis of the economic aspects of human behavior within the

into a many-sided value, and has been attributed many interpretations. Smelser enumerates the following four interpretations, of which some are more acceptable than others: (1) Psychological postulate. As a matter of psychological fact, material satisfactions are the sole motivating factor in man's existence, and he chooses rationally only among these material satisfactions. (2) Behavioral postulate. Although economic rationality may not be the total psychology of man, behaviorally man acts rationally when faced with an economic situation. That is, although men in all societies economize, the number and kinds of situations in which they economize are extremely variable. (3) Investigative device for conceptual simplification. An analyst can take economic rationality as a set of assumptions to simplify and manage the enormous motivational variability of the empirical world, and then reject it if he finds it unhelpful in analyzing the scientific problems he faces. (4) Institutionalized value. As discussed above in the text. Ibid. See also Walter A. Weisskopf, The Psychology of Economics (Chicago: University of Chicago Press, 1955), pp. 3-15.

¹This is the basic theme of Adam Smith's celebrated "invisible hand." It is this invisible hand which coordinates isolated acts of individuals who neither intend to promote the public interest nor do they know that they promote it so abundantly. It is the institution of free exchange, aided by individualism, rationality, perfect information, and rational choice, that makes the function of the invisible hand possible. See Adam Smith, The Wealth of Nations (New York: Modern Library, 1937), p. 423.
context of the structure and operation of societies.\footnote{1}

F. The Integrative Function of the Institutions

Formally defined, institutions are "the ways in which the value-patterns of the common culture of a social system are integrated in the concrete action of its units in their interaction with each other . . . ."\footnote{2} This mutual interaction is achieved by defining the role expectations and organizing the motivation. In general, they guide human behavior in social relationships for people in interaction with each other as members of the society.

Values provide a broad direction of societal action, but they do not tell the individual what to do in a given situation because they are too general and too undifferentiated with respect to the internal structure of the social system. Rather, they are

\footnote{1}{Moore, \textit{Economy and Society}, p. 18. Similarly, Barnard legitimates money returns--the profit maximization--within the larger organizational purpose of the business firm. An organization is defined by the primacy of a type of goal. The focus of its value system must be the legitimation of this goal in terms of the functional significance of its attainment for the superordinate system. There is also a legitimation of the primacy of this goal over other possible interests and values of the organization or its members. Thus, the value system of a business firm in our society is a version of economic rationality which legitimates the goal of economic production, and the efficient utilization of resources toward this goal. This is what Barnard means by the organizational purpose. For the business firm, money return is a primary measure and symbol of success, and is thus a part of the goal-structure of the organization, but it cannot be the primary organizational goal because profit-making is not by itself a function in behalf of the society as a system. See Chester I. Barnard, \textit{The Functions of an Executive} (Cambridge: Harvard University Press, 1958), chs. iv and vii; and Parsons, \textit{Structure and Process in Modern Societies}, pp. 16-22.}

\footnote{2}{Parsons and Smelser, \textit{Economy and Society}, p. 102.}
independent of the specific content of system structure, situation or goals.\(^1\) Institutions, on the other hand, are normative patterns that define the expected action—by prescription, permission or prohibition—on the part of persons situated in different statuses and conditions within the system. They command an action by setting limits within which sanctions will be applied if the expectations are not fulfilled.

By balancing performances against sanctions, the institutions provide conditions of maintaining an equilibrium in terms of meeting the functional prerequisites of the system under more or less typical states. Thus, the institutions relate society's value-patterns to the real action processes of social behavior. The most fundamental function of the institutions is therefore to regulate social relations.

There are two main aspects of this regulation: the maintenance of relative conformity with the formative requirements of the value-pattern, and the maintenance of relative consistency in the institutionalized patterns themselves, both in terms of generality of application and in terms of the different fields or range of application.\(^2\) In both these senses, institutions primarily provide the integrative function to the social system.

\(^1\)Parsons, *Structure and Process in Modern Societies*, p. 178.

\(^2\)Parsons and Smelser, *Economy and Society*, pp. 102-103.
G. Capitalism and the Rationality of the West

Max Weber, more than any other social scientist in the last 200 years, tried to develop a comprehensive institutional framework of economic action. In his conceptual scheme, Weber saw modern Western capitalism as a configuration of institutions which, by the logic of their own requirements, increasingly narrowed the range of effective choices open to men. What he presented was an account of the institutional structure of economic activity and the ranges of variation to which the structure was subjected. With capitalism, at each scale and each stage, there were peculiar institutional features. In his comparative historical analysis of various economic systems of the world, he found modern Western capitalism more as a pervasive and unifying affair which absorbed other institutions into its own image.¹

For Weber, modern Western capitalism was the epitome of rationality because it contained the highest form of rational operations. Further, he writes:

It is only in the modern Western world that rational capitalistic enterprises with fixed capital, free

¹Weber, The Theory of Social and Economic Organization, pp. 30-50. The remaining sections of this chapter and the next chapter have been developed with substantial assistance from the works of Max Weber, principally his works on economy. There are several translations available of his classic work, Wirtschaft and Gesellschaft. For the sake of consistency, however, The Theory of Social and Economic Organization, trans. by Henderson and Parsons, has been used throughout this study. All references to Weber are from this book, unless otherwise noted. This book was one of the earliest attempts to introduce Weber's writings to the English-speaking public, and also contains an excellent introduction by Parsons, which has been relied upon and drawn from in this inquiry.
labour, the rational specialization and combination of functions, and the allocation of productive functions on the basis of capitalistic enterprises, bound together in a market economy, are to be found. . . . It is also only here that we find public credit in the form of issues of government securities, the legal form of the business corporation, the issues of securities, and financing carried on as the business of rational enterprises, trade in commodities and securities or organized exchanges, money and capital markets, monopolistic associations as a type of economically rational organization of the production of goods by profit-making enterprises as opposed to the mere trade in them. . . .

This difference calls for an explanation and the explanation cannot be given on economic grounds alone.¹

Rational bourgeois capitalism of the West was much more than a mere form of economic organization. Capitalism should be regarded as the distinctive pattern of a whole society. Its effective functioning required a personality to whom spiritual and material asceticism were values in themselves. Weber found this in the Calvinist who sought to prove his worth as one of the chosen by making the success of an enterprise his prime objective, and whose theology dictated unremitting toil and prohibited a pleasurable way of life. The Calvinist, therefore, reinvested his gains back into the business only, and from this stemmed the accumulation of capital.²


²The Calvinist reference here is to John Calvin (1509-1564), the French Protestant theologian of the Reformation, whose monumental book, Institutes of the Christian Religion, sets forth the basic Calvinist theology. The extension of Calvinism to all spheres of human activity was extremely important in a world
There is an emphasis on rationality in the Calvinistic orientation of the West. All traditions are critically examined and nothing is sacred merely because it has become traditionally accepted and established. Everything must be tested anew in terms of a universalistic standard. To rationalize the world process is to imply systematization of conduct according to rational norms where no single act can stand by itself or be valued on its own merits alone, but only in terms of its bearing on a whole system of rational conduct.

In ethical universalism all men are treated by the same generalized impersonal standards. In combination with an active ascetic attitude, this becomes an obligation for the ordering of ordinary life. The high functional differentiation and specialization of roles in Western society are reconciled with a high valuation placed on human personality by suggesting that in the

emerging from the agrarian, medieval economy into a commercial, industrial era, because the development of a successful industrial economy was stimulated by Christian virtues, such as thrift, industry, sobriety, and responsibility that Calvin preached as essential to the achievement of God's reign on earth. See "Calvin, John," The Columbia-Viking Desk Encyclopedia, 1964, p. 288.

In pursuit of universal equality, the capitalist theory has focused on guaranteeing the fairness of competitive conditions to foster the pattern of equality of opportunity. Historically, however, the market became the focus of competitive individualism which led to differential success. Since the native ability of the individual to attain an equitable standing directly through market competition can no longer be assumed, again in pursuit of equality, the American focus is now on an educational revolution, which in a certain sense synthesizes the themes of the industrial and democratic revolutions: equality of opportunity and equality of citizenship. See Parsons, The System of Modern Societies, ch. vi.
process of active mastery over the world, the individual is an
instrument of a higher instance, of God's will, and is working
in the service of an impersonal end beyond his own personal
interest.

This is the spiritual construction of the background of
modern capitalism. It is the concept of "calling"--the idea of
an individual's "business in life" as a matter of moral obliga-
tion--which is to a comparable degree distinctive of modern life.
In general, modern capitalism in its beginnings required a cer-
tain type of personality. This personality type, in turn, was
psychologically construed as a result of a belief in a set of
ideas that unwittingly resulted in the development of these
specific personality traits useful in the conduct of the capi-
talist.¹

The great extent to which religious forces have exerted
an influence on economic development can be seen in the rational-
istic form of capitalism known to the Protestant West, but which
did not manifest itself in India or China. This was because only
in Europe had certain spiritual drives and material concerns co-
incided at a given point in history to create the economy of
capitalism. Thus, an economy cannot be explained through its
internal elements alone. It is necessary to incorporate

¹Max Weber, The Protestant Ethic and the Spirit of
Capitalism, trans. by Talcott Parsons (New York: Charles
Scribner's Sons, 1958). Also, see Weber, The Theory of Social
and Economic Organization, pp. 78-86; Weimann, The Psychology
significant exogenous forces into the theoretical structure as well. In the case of occidental capitalism, religion helped to form an effective instrument for the creation of wealth.¹

IX. THE SOCIAL PERSPECTIVE OF ACCOUNTING

A. Accounting: The Epitome of Capitalist Rationality

While remaining at the level of generating historical insights concerning the pattern of institutional structures surrounding economic phenomena, Weber delineated the conditions under which capitalism of the modern Western type could arise and flourish. Unlike traditional economists, he was not interested in the regularities, such as business cycles which are produced within the capitalist system of production; instead, he was interested in establishing the important institutional conditions under which capitalist systems and their regularities came into being.

1 Weber was careful, however, to distinguish between various types of capitalism, and to identify only industrial capitalism with the ascetic Protestantism of the West. The systematic and rational organization of production was more likely under industrial capitalism. Its uniqueness consists in the fact that a specific production establishment emerges and is enlarged at the expense of precapitalist production units. Based on the organization of formally free labor and the fixed plant, the production establishment has its legal, political, and ideological conditions properly specified. This made it possible, as Saint-Simon theorized, to create wealth by production and machinery rather than to seize it through plunder and war. See Weber, The Theory of Social and Economic Organization, pp. 278-281; Weber, From Max Weber, pp. 65-70; and Henri de Saint-Simon, Social Organization, The Science of Man, and Other Writings, ed. and trans. by Felix Markham, Harper Torchbooks (New York: Harper & Row, Publishers, 1952).

2 As Seligman comments, while Weber developed an institutional framework for economic action, he seldom inquired into what an economist would consider to be the really substantive issues, such as the business cycle. Rather, in line with the great nineteenth-century universal thinkers, such as Hegel, Marx, Comte, Tocqueville, Mill, and Spencer, he aimed at universal
Of all the institutional conditions, rationality was the fundamental basis of contemporary capitalism. To achieve a highly rational form of capitalism, one of the most important prerequisites was accounting. Only with accounting was it possible to carry through the accurate and sustained rational calculation of the quantities involved in an economic exchange and to act upon the results of such calculation. Accounting symbolized the highest degree of rationality because it simplified the goals and standards of success of an economic activity. In fact, Weber defined a rational capitalistic establishment as "one with capital accounting, that is, an establishment which determines its income yielding power by calculation according to the methods of modern bookkeeping and the striking of a balance."¹ Weber is not alone in this conviction.²

interpretations of human history. Essentially a polyhistor, Weber rarely concerned himself with the immediately practical. Even though he was originally trained as a student of law, his profound scholarship ranged across jurisprudence, political science, economics, sociology, comparative religion, the philosophy of history, and the histories of several nations and half a dozen civilizations, both ancient and modern. As Wrong suggests, with the exception of Freud and, more doubtfully, Marx, no other thinker has had so great an influence on modern social science. See Seligman, Main Currents in Modern Economics, pp. 22-24; and Wrong, "Introduction," pp. 1-2.

¹Max Weber, General Economic History, trans., by Frank H. Knight (Glencoe, Ill.: Free Press, 1927), p. 275. It should be noted that in addition to capital accounting, the attainment of a high level of rationality requires two other substantive conditions: the wide extension of market competition between autonomous economic units, and an effective demand to influence production and the marketing of goods. See Weber, The Theory of Social and Economic Organization, pp. 34-37, 50-51, and 202-212.

²Even Lenin realized the importance of accounting during the Soviet industrialization. He exhorted: "Accounting and
B. Accounting as an Institution of Western Capitalism

Economic historians have emphasized, in varying degrees,
that systematic bookkeeping has been essential to the development and rise of modern capitalism. The "rationalistic pursuit of unlimited profits" would not have been possible, or would not have been so effective, without scientific accounting as an instrument in the hands of the entrepreneur. Following is a summary of the reasons why Sombart, Schumpeter, and others have assigned to double-entry bookkeeping such a prominent role in the history of capitalism:

(a) The idea of gain was reduced by scientific bookkeeping to an abstraction "by putting the profit in a specific form, a definite sum of money in contrast to the natural aim of subsistence which was in the fore-front of the medieval business man's mental attitude. It was the abstraction of profit that first made the concept of capital possible." "The very conception of capital as 'lucrative possessions' practically depends on the analysis of scientific accounting." "By crystallizing and defining numerically, it (the cost-profit calculus) powerfully propels the logic of enterprise."

(b) "From this abstract formulation of the results of business activity, it was only a step to rationalization. Systematic accounting made it possible for the capitalistic entrepreneur to formulate his aim, to recognize the degree to which he was attaining it, to determine his plans for his future activity." "From the observation and study of events that are over it provides the possibility of forejudging future activity and finding a sure basis for reasoning out the actions to come."

(c) "Systematic organization is one of the most

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1For instance, Sombart finds it difficult to conceive of capitalism without double-entry bookkeeping because the "two are related as to form and content." Further, he says, it would be difficult to decide "whether in double-entry bookkeeping capitalism provided itself with a tool to make it more effective, or whether capitalism derives from the 'spirit' of double-entry bookkeeping." See Sombart, as quoted in B. S. Yamee, "Introduction," in Studies in the History of Accounting, ed. by A. C. Littleton and B. S. Yamee (Homewood, Ill.: Richard D. Irwin, Inc., 1950), p. 9.
powerful agents of economic progress, and this holds good perhaps more of systematic bookkeeping than of any other form." Organization also disciplines the entrepreneur and whets the edge of his "desire to save and to acquire."

(d) "Another aspect of capitalism which depends upon complete accounting is the mechanization and deper-sonalization of business. The entrepreneur and the enterprise were separated from each other."  

C. Institutional Conditions for Accounting Rationality

The fundamental phenomenon in Western capitalism is the development of profit-making enterprises which are rationally oriented to capital accounting, that is, to the goal of the in-crease of money resources at the command of enterprise. It is in relation to this phenomenon that the general concept of capitalism can be defined.  

Toward this concept, the following are a few Weberian institutional conditions of capital account­ing, in particular, and of rationalized economic systems, in general:

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1B. S. Yamee, "Scientific Bookkeeping and the Rise of Capitalism," The Economic History Review, 2nd series, I (1949), 99-100. Yamee provides the footnotes to the works of Weber, Nussbaum, Robertson, and Schumpeter for the specific quotations contained here. However, it should be noted that Yamee personally prefers a far more modest appraisal of the role and significance of double entry. For him, the evidence of early bookkeeping techniques gives little support to the views summarized above. Rather, he suggests, accounting served limited objectives and, in particular, the striking of balances was performed for narrow bookkeeping purposes. See ibid.; and Yamee, "Introduction," pp. 6-13.

2In his last lectures, given in the winter of 1919-20, Weber brought the concept of rationality to the core of capital­ism, and enumerated factors which produced Western capitalism in the last resort: rational permanent enterprise, rational account­ing, rational law, rational spirit, the rationalization of the conduct of life in general and a rationalistic economic ethic. Weber, General Economic History, p. 354.
The maximum of calculability of the technical conditions of the productive process; that is, a mechanically rational technology. . . . Complete calculability of the functioning of public administration and the legal order and a reliable formal guarantee of all contracts by the political authority. . . . This is formally rational administration and law. . . . The most complete possible separation of the enterprise and its conditions of success and failure, from the household or private budgetary unit and its property interests. It is particularly important that the capital at the disposal of the enterprise should be clearly distinguished from the private wealth of the owners, and should not be subject to division or dispersion through inheritance. For large-scale enterprises, this condition tends to approach an optimum from a formal point of view in the fields of transport, manufacture, and mining, when they are organized in corporate form with freely transferrable shares and limited liability. In the field of agriculture, relatively long-term leases on a large scale constitute formally the most favorable situation. . . . A monetary system with the highest possible degree of formal rationality.¹

These institutional conditions of Western capitalism provided a framework in which accounting has functioned from the early nineteenth to the mid-twentieth century. Like any social institution, accounting implies certain rights and obligations that constitute expected citizen behavior. Thus, a suggestion was made that the institution of accounting and business include the following representative rights and obligations: the rights (1) to financial profit, (2) to own property, (3) to prestige for managers, (4) to freedom of use of owned property, and (5) to select employee members; and the obligations (1) to supply society with adequate economic goods, (2) to contribute to noneconomic social goals, (3) to meet the financial requirements of investors...

and employees, (4) to comply with the laws of the land, and (5) to provide work for people. To the extent that accounting and business do not meet these obligations, and to the extent that society does not grant accounting and business their rights, the institutions of accounting and business are weakened.¹

D. The Concept of Accountability and the Advent of the Accounting Function

From the clay tables that Babylonian businessmen used to record their sales and money-lending some 4000 years ago to the present-day computerized financial statements, accounting as a field of knowledge has always been shaped in context with the existing social institutions of its day. The training of accountants has also been moulded by the tremendous conditioning power of the existing social institutions.² Scientific thought, especially on social and political matters, does not proceed in a vacuum, but in a socially-conditioned atmosphere. The social habitat of the scientist is largely influenced by the hidden unconscious and subconscious elements which determine a whole system of opinions and theories appearing to him as unquestionably true or self-evident.³


²Carl T. Devine, Essays in Accounting Theory, Vol. I (3 vols.; Deland, Fla.: By the Author, n.d.), p. 91. Many of the references that follow were first found here and then traced to the original sources for further research.

Accounting art and practices have gone through many metamorphoses. Each social habitat that accounting passes through has contained antecedents and causal conditions of the institutional context. During the Middle Ages accounting languished, in company with most other elements of learning and trade, and in a barter and manorial economy the financial transactions that are the lifeblood of accounting tended to disappear. It should be noted, moreover, that we find nothing recorded about bookkeeping as practiced in the Indian trading houses of antiquity, although it was in India that the Hindus first developed the position-numerals from which occidental bookkeeping was derived. The reason, apparently, is that within the early Hindu institutional framework the trading unit remained a closed family affair, and accountability was therefore not a social imperative.

On the other hand, genuine bookkeeping first arose in medieval Italy, and as late as the sixteenth century, German clerks traveled there to secure instruction in the art. It was during the revival of Italian commerce in the thirteenth and fourteenth centuries that the concept of accountability arose. Because of the spreading association of outsiders in the family business, the first viable basis for the trading company separated household

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and business accounting as the need for credit sharply increased. 1

These Italian developments created a need for records: to help merchants control their dealings with customers and employees, to indicate the relative interests of creditors and owners, and to apportion profits among the partners. Thus, the first double-entry systems of bookkeeping evolved during this period. 2

E. The Accounting Function in Its Temporal Perspective

The interrelationship between the forms of thought, especially social thought, and the forms of society can also be seen in its temporal perspective. Special art forms can be definitely identified with certain periods of history. Likewise, specific forms and perspectives of knowledge can also be associated with increasing exactness to a particular historical as well as institutional setting. "Every epoch has its fundamentally new approach and its characteristic point of view, and consequently sees the 'same' object from a new perspective." 3

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2Davidson, "Accounting," p. 15. Also, Yamee has noted three distinct advantages of double-entry bookkeeping over the earlier methods which attracted the Italian traders: (1) the records are more comprehensive and orderly; (2) the quality of entries provides a convenient check on the accuracy or completeness of the ledger; and (3) the ledger includes personal, real, and nominal accounts in an integrated whole, and thus contains the materials for developing statements of profit and loss and of capital, assets, and liabilities as part of the system. See Yamee, "Introduction," p. 7.

3Karl Mannheim, Ideology and Utopia: An Introduction to the Sociology of Knowledge, trans. by Louis Wirth and Edward
Similarly, the appearance of various forms of the accounting function at different times in history also has its historical significance. Thus:

The British stewardship principle with its emphasis on charge and discharge of responsibility may be associated naturally with the semi-feudal social arrangements of the time with their emphasis on rights and correlative responsibilities. The venture accounting of the Italian city states and much later in connection with mining ventures in the Western world is appropriate for the purposes and institutions involved. Of more recent date, one finds emphasis on the viewpoint of short term creditors reflected in the study and accentuation of the financial report. The change of organization type with the rise of important investors and managers brought about a slow and ponderous swing of emphasis in accounting to the income report and to managerial accounting.¹

Reflecting on the metamorphosis of the accounting function over time, one can extend a pure analysis of its thought structure to determine when and where the socioeconomic phenomenon presented


¹Devine, Essays in Accounting Theory, p. 91. Devine also explains the fundamental association between double-entry bookkeeping and the institution of private property in the environmental framework. He thinks that this connection is least justified, and that the identification of the recording process with the dominant social institutions during the period of development and growth may have limited some otherwise astute accountants in their application of double-entry record keeping to all kinds of alternative institutions, e.g., sectors of socialist economies and cooperative organizations. Ibid. Similarly, the American Accounting Association particularly envisages a broad application of the accounting process to include not only the business operated for profit, but also the activities of individuals, fiduciaries, government units, charitable enterprises, and similar entities. It conceives accounting as an information system designed to serve managers and others in carrying out the organizational objectives of entities in which profitability is not the sole or even an important objective. See American Accounting Association, A Statement of Basic Accounting Theory, p. 2.
itself in such a light that it enlightened the accounting function in a particular perspective. Such an analysis can be carried on to the point where the more inclusive question may be answered: why the phenomenon presented itself in such a manner so that only particular images were created. However, the clue to the temporal variation in the evolution of knowledge is not to be found in the phenomenon or the object itself; if it were, it would be impossible to understand why a particular phenomenon or object should appear in so many different refractions. Rather, the variation can be understood in the different expectations, purposes, and impulses that arise out of the human existence of a particular time.

The approach toward defining the function of a discipline, the level on which that function happens to be formulated, the stage of abstraction and the stage of concreteness one hopes to attain in understanding the larger societal processes through that function—these are all collectively bound up with the social existence. The modes and shapes that become imperative in

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1Mannheim, *Ideology and Utopia*, pp. 1-5. Mannheim further suggests that the examination of the object is not an isolated act; it takes place in a context which is colored by values, collective-unconscious, and volitional impulses of a particular time. In the social sciences, it is the intellectual interest, oriented in a matrix of collective activity of a particular time, which provides the general questions, the concrete hypotheses for research, and the thought-models for the ordering of experience. Ibid.

2Ibid., pp. 207-279. This approaches Mannheim's main thesis of the "sociology of knowledge" which suggests that models of human thought cannot be adequately understood as long as their social origins are obscured. The sociology of knowledge seeks to comprehend thought in the concrete setting of an historical-social situation out of which individually differentiated thought only gradually emerges. Thus, it is not men in general who think, or even isolated individuals who do the thinking, but men in certain
the performance of the accounting function thus cannot be ade-
quately understood as long as their social origins remain ob-
scured, and their institutional context remains unexplained.
There is a definite social character in every science and scien-
tific method which puts its imprint on their function. What is
still more important is that their functional relevance is also
tested within the institutional framework that shapes their
social character.¹

Thus, if the financial institutions of a society which
pays scant respect to the accumulation of wealth and economic
power are different from those of a society which permits and
estems thrift and accumulation, then the kind of accounting
function which is appropriate in these societies will surely have

¹This indeed is a hen-and-egg process which, Boulding
thinks, is perhaps the most important key to the understanding
of the dynamics of a social science which manifests itself as an
image of society. The image not only makes society, but society
also continually remakes the image. The image in any society
provides the basic bond, the essential characteristics of which
are shared by the individual participants. This provides the
basic dilemma for an individual participant: how to break through
the social environment and free oneself from the total value sys-
tem of the society. See Kenneth B. Boulding, The Image: Know-
Tide of Prophecy, pp. 215-220. Ijiri has noted the same dilemma
for those who use accounting reports to communicate. He notes
that, like any other language, accounting has a complicated set
of rules on how one may express the economic events of an entity.
These rules are aimed at serving people, but on the other hand,
to be different. Likewise, there will be a different kind of accounting function in an economy with no system of credit than in the one with a well-developed credit system. Significant differences will also be evident between the accounting function appropriate to business entities where there is no corporate business and no widespread investment in corporate business, and the accounting function appropriate to business entities in a highly industrialized economy where such devices and institutions are common.¹

F. Social Uses of Accounting: An Overview

Literature abounds on the variety of utilitarian demands made on the accounting function by society at large. The nature and emphasis of these demands change as the institutional framework of society changes. In this respect, the accounting profession is similar to that of law, because both are forced to evolve continuously to meet the changing needs of the time.² May has

people are constrained by them. Unless people sacrifice their freedom and observe the rules, accounting cannot serve them. Yuji Ijiri, "Logic and Sanctions in Accounting," in Accounting in Perspective: Contributions to Accounting Thought by Other Disciplines, ed. by Robert R. Sterling and William F. Benz (Cincinnati: South-Western Publishing Co., 1971), p. 3.

¹Chambers, Accounting, Evaluation and Economic Behavior, p. 15.

²Percival F. Brundage, "Milestones on the Path of Accounting," Harvard Business Review, XXIX (July, 1951), 71. Here, Brundage quotes Mr. Justice Holmes, saying that a large part of our law is "open to reconsideration upon a slight change in the habit of the public mind," and thinks that what is true of law is equally true of accounting. Ibid. Further, as Vance suggests,
comprehensively summarized the various uses of the accounting function as they came to be expected of it from time to time:

(1) A report of stewardship
(2) A basis for fiscal policy
(3) A device to determine the legality of dividends
(4) A guide to wise dividend action
(5) A basis for granting of credit
(6) Information for prospective investors in an enterprise
(7) A guide to the value of investments already made
(8) An aid to government supervision
(9) A basis for price or rate regulation
(10) A basis for taxation

In addition, the accounting function has made it possible for the various local governments and their agencies to render reports to the taxpayers; for health and welfare organizations to

only the changes outside of accounting, such as the 1913 constitutional amendment making income tax lawful, forced a spectacular development in codifying accounting principles. See Lawrence L. Vance, "The Road to Reform of Accounting Principles," The Accounting Review, XLIV (October, 1969), 692-703. On the subject of being forced to be responsive to the changing needs of the times, the accounting profession drew fire recently from the Securities and Exchange Commission chairman, William J. Casey. In a strongly-worded speech, Mr. Casey indicated to the accounting profession that the SEC might undertake to force the pace at which the profession meets the multiplicity of demands made upon it and generates reports which are more comparable, more revealing, and more meaningful. See "Casey Warns Accountants of SEC Action If Industry Doesn't Upgrade Standards," Wall Street Journal, October 3, 1972, p. 3.

George O. May, Financial Accounting: A Distillation of Experience (New York: Macmillan Company, 1957), p. 3. However, May divides these ten major uses of accounting into two groups of five: the first five as the older, and the second five as more modern. He suggests that the distinction between the two groups is significant. Accounting has recognized, in the first group, the provisional character of all measurements of income and the greater uncertainty attached to the attempts to allocate income to particular short periods of time. The major influences on corporate financial accounting, however, came from the second group. Ibid., pp. 18-25.
make financial reports to contributors; for parties to various types of contracts to make financial reports to each other; and for labor unions and other segments of the larger society to gain more information and, hopefully, greater understanding of the impact of corporate activities.¹

More often than not, however, the accounting function has been symbolized with the income determination function, and, in most cases, the latter became the most important, if not the only, function of accounting.² From the viewpoints of economists as well as philosophers, accounting in its income determination function provides an important social contribution. For the economists:

(1) The income objective tends to cause resources to be allocated to their most productive use, provided that competition is free.
(2) Measured past income may be used either by itself or in combination with other factors as a basis for computing the return on investment to evaluate the effectiveness of management, assuming that income is the primary objective of management.
(3) "Real" income may be used to evaluate the growth of a nation and the effectiveness, in an economic sense, of the political system under which the


²William J. Vatter, The Fund Theory of Accounting and Its Implications for Financial Reports, p. 35. Vatter further suggests that this is in spite of the fact that the measurement of income is not the sole, or even the most important, aim of accounting. He fears that there are grounds for the belief that the accountant has overemphasized and overworked the notion of income far past the point of diminishing return. Ibid. Nearly a quarter of a century later, Bedford also expressed similar views. See Bedford, The Future of Accounting in a Changing Society, pp. 20-21.
nation operates.¹

And for the philosophers:

(1) It is a means to gratify mankind's physiological requirements (food, clothing, shelter, medicine), and enables man to consider both present and anticipated future needs.
(2) It is a means to satisfy the need for self-expression in the form of pursuit of noneconomic interests (religious, ethical, scientific, and esthetic).
(3) It is a means to satisfy the need for social recognition (power, prestige, and popularity).²

Maslow's goal hierarchy has amply shown that for the mass of mankind, physiological needs still predominate in the meaning of work and, therefore, of income, too. Income as a means to satisfy the needs for social recognition becomes significant only to those who have effectively satisfied their needs for physical existence and self-expression.³


³In what has since become a classic article, Maslow suggested that the meaning of work and, consequently, of income earned from work, to an individual varies with his needs and the extent to which they are satisfied in a work situation. He has captured these changes in his famous hierarchy of needs classification, as follows: (1) physiological needs of hunger, thirst, the activity-sleep cycle, sex, and evaluation; (2) safety needs for protection against danger, threat, and deprivation; (3) love needs for satisfactory associations with others, for belonging to groups and for giving and receiving friendship and affection; (4) esteem needs for self-respect and the esteem of others, often referred to as ego or status needs; and (5) self-realization, self-fulfillment, or self-actualization needs to achieve the potential within an individual for self-development, creativity, and self-expression. See A. H. Maslow, "A Theory of Human Motivation," The Psychological Review, L (July, 1943), 370-396; and George A. Steiner, Business and Society, Random House Books in
From the accountant's corner, however, the role of business income as a device to appraise the administrative process, that is, to disclose overall efficiency or inefficiency, is perhaps the most significant. In the process of income determination, the accounting function is concerned with "the provision of some of the facts on the basis of which one may act knowledgeably given one's ends or purposes." For the accountant, the basic

Management (New York: Random House, 1971), ch. xiii, for a discussion on the changing role of men in organizations in relation to the Maslow hierarchy. Similarly, Lazarsfeld notes that in addition to the rapidly developing role of measurement in society which appears to be an important aspect of the future social environment in which accounting will operate, sociological findings suggest that the motivational values of society in the future may shift toward intellectual matters. Further, this intellectual aspect of accounting may become greatly esteemed by the young accountants of the future. See Paul Lazarsfeld, "Accounting and Social Bookkeeping," in Accounting in Perspective, ed. by Sterling and Bentz, pp. 99-100.

1Bedford, Income Determination Theory, p. 17. Similarly, the late President Lyndon B. Johnson also viewed the importance of accounting as an instrument for efficiency on a larger scale for the entire society. In his message celebrating the fiftieth anniversary of the American Accounting Association, he suggested that to the individual, to public and private organizations, and to the nation itself, financial reporting becomes at once a gauge of past progress and a tool for future planning. In this function, "accounting serves as an important instrument for efficiency and progress." See The Accounting Review, XLII (January, 1967), 175.

2Chambers, Accounting, Evaluation and Economic Behavior, p. 15. How one goes about providing these facts, however, is another matter and open to endless controversies. The most comprehensive attempt to arrive at the accounting function which would provide such facts was made by Chambers; for him, functionally, accounting should be "a method of retrospective and contemporary monetary calculation, the purpose of which is to provide a continuous source of financial information as a guide to future action in the market." Ibid., p. 99. Two representative criticisms of Chambers' view of the accounting function can be found in Kermit Larson and R. W. Schattke, "Current Cash Equivalent, Additivity and Financial Action," The Accounting Review, XLI (October, 1966), 634-641; and George J. Staubus, "Current Cash Equivalent
objective of the process of income determination has been to help investors make rational decisions founded on the most informative financial data which can be provided to them through financial statements.¹

Earlier in this analysis, we considered the functional differentiation of the social system and suggested that every social system must have a means to (1) recognize attainable goals, (2) adapt to change, (3) maintain its social structure, and (4) coordinate all parts into an integrated whole. Accounting as a profession can be viewed as a social institution.² It has


¹Francis M. Wheat, "A Prognosis for the New Financial Accounting Standards Board," World, Peat, Marwick, Mitchell & Co., Summer, 1972, pp. 4-5. Wheat feels so strongly about this objective that he warns that if financial accounting is adulterated by any other objective, however worthy it may seem at first blush, such an adulteration will violate the fundamental purpose and value of the free market system as the primary mechanism for allocating our capital resources. This will impair the very legitimacy of accounting, and risk even its demise. Ibid. Further, G. Bradford Cook, chairman of the Securities and Exchange Commission, recently indicated that there is already a decline in the unique ability of the U.S. capital market system to raise new capital for many thousands of corporations throughout the country. James Needham, chairman of the New York Stock Exchange, places some of this blame on the accounting profession. It is generally felt that financial statements do not convey sufficient meaningful information to the investor. See Editorial, Wall Street Journal, May 7, 1973, p. 20; and "Needham Scores Accountants," New York Times, June 15, 1973, p. 51.

²For example, Imke views accounting as a service institution in society, and suggests that it exists to serve the society. For him, this is the first and only postulate of accounting that explains the reason for its existence. See Frank J. Imke, "Relationships in Accounting Theory," The Accounting Review, XLI (April, 1946), 320-321. As Devine suggests, it is trite to imply that accounting is a service activity. In fact, accounting is tinged by the public interest, and it should have its procedures
within itself certain normative patterns governing its internal structure and functional performance. That these patterns are not always logical and consistent, and that the accounting function is fulfilled with more or less effectiveness, is another matter.

There is no guarantee, moreover, that an institutional order will always be uniformly successful in harmonizing individual and collective interests, and in providing a means to satisfy the functional needs of society. Failure to harmonize conflicting interests and to fulfill the functional needs of society appraised by reference to some quantitative scale of social usefulness. See Carl Thomas Devine, "Research Methodology and Accounting Theory Formation," The Accounting Review, XXXV (July, 1960), 397-398.

1 For instance, Grady provides an excellent survey of such normative patterns and the authoritative pronouncements that guide the functional performance of accountants. See Paul Grady, Inventory of Generally Accepted Accounting Principles for Business Enterprises, Accounting Research Study No. 7 (New York: American Institute of Certified Public Accountants, Inc., 1965). For an analysis of accounting patterns and structure particularly related to income determination, see Robert R. Sterling, Theory of the Measurement of Enterprise Income (Lawrence: University of Kansas, 1970), chs. xi and xii; and Bedford, Income Determination Theory.

2 There is also a contention that existing accounting patterns could not be all that bad, for through them commerce has survived all this time and, indeed, prospered. However, as Chambers suggests, that is so, not because of the accounting practice, but in spite of it, for mankind is enormously resilient. "It did not perish for want of knowledge of anatomy, of the circulatory systems, or of immunology. Men are able to communicate with other men to a limited extent, even though their verbal languages have nothing in common." See Chambers, Accounting, Evaluation and Economic Behavior, p. 360. Here he provides a footnote, quoting, "We must not deny the probability that societies can tolerate, even without disintegration, much more disorganization and even ruin than many people recognize." See David Riesman, Nathan Glazer, and Reuel Denney, The Lonely Crowd (Garden City, N. J.: Doubleday & Company, Inc., 1950), p. 45.
successfully does not disprove the institutional mission and its framework. Rather, it documents the difficulties or accomplishing these tasks in a complex society.¹ In addition to the normative patterns within itself, accounting as an institution must be sensitive to the social norms and cultural values guiding the operation of the society. That is,

accounting must operate in accordance with the social norms and cultural values which enable society to establish goals, integrate elements, maintain its social structure, and adapt to change. Broadly then, accounting will have a function in society if it contributes to the means for meeting any of the societal requirements and basic human needs of society. It will have a dysfunction if it impedes the realization of means for satisfying any one of them.²

¹Moore, Economy and Society, p. 18.
X. THE ECONOMIZING MODE OF INDUSTRIAL SOCIETY

A given technology imposes certain social as well as political characteristics upon the society in which it is found. From the natural reproduction of the primitive society where the yearly cycle of subsistence provided the dominant time-scale, to the scientific and technological innovations of the post-industrial society, it is the decisive societal impact of the given technology that has determined the rhythm of human civilization through the ages.¹

What was true regarding the societal impact of the hand-mill or steam-mill is inevitably more true of the technological revolution because the latter has intruded itself in the human base of civilization much more profoundly than anything before it. In many respects, human civilization acquired some fundamental changes in its logic and time-scale. It may be that human civilization will never recover its earlier substance. The technological revolution literally has touched and transformed everything that has ever had anything to do with human life.²

A. A Concept of the Industrial Society: The Vision of Saint-Simon

The concept of the industrial society can be organized

¹Richta, Civilization at the Crossroads, p. 209.

around the axis of economic growth, where the locus of society is the industrial enterprise and the social relations which derive from the organization of labor around machine production. Extending sociologically, the concept emerges as the one single reality of the industrial civilization, where the differences between the capitalist and communist societies begin to disappear. Rather, these societies look like two species of the same genus, or two versions of the same social type. There are certain fundamental characteristics from which no industrial society can escape, regardless of its ideological predilections. These characteristics include the basic industrial technology, technical and engineering knowledge, classification of the jobs and skills, etc. In these societies, the proportion of technical occupation increases relative to other categories, and management emerges as a primary technical skill.¹

¹Bell, "Post-Industrial Society," pp. 124-125, 158-159. Similarly, Galbraith argues that the convergent tendencies of industrial societies of different ideological billing are primarily the consequences of their modern large-scale production, with heavy requirements of capital, sophisticated technology, and elaborate organization. Furthermore, these convergent tendencies imply that ideology is not the relevant force. See Galbraith, The New Industrial State, p. 398. Observing the increasing trends toward bureaucracy and centralization in both the Soviet Union and the United States, sociologists, such as Sorokin and Mills, have noted that the two societies are gradually becoming alike. See C. Wright Mills, The Causes of World War Three (New York: Simon and Schuster, 1958), Pt. I, sec. 3; and Pitirim Sorokin, Russia and the U.S. (2nd ed.; London: London Institute of World Affairs, 1950). For Tinbergen, the guiding factor in this convergence is the nature of economic rationality which necessitates a common model of modified planning to be tied directly or indirectly to the use of the market. See Jan Tinbergen, "Do Communist and Free Economies Show a Converging Pattern?" Soviet Studies, XII (April, 1961), 333-341. However, Aron and Halm have raised considerable doubts about the entire theme of convergence from sociological
Saint-Simon envisioned the industrial society as a system of planning and rational order in which the society would specify its needs and organize the factors of production to achieve them. His was a vision of pure technocracy, where the industrial society was characterized by two elements: knowledge and organization. Like an orchestra where each person fulfills his function in accordance with his competence, the industrial society would be organized by function and capacity. With the theme, "from each according to his capacity, to each according to his performance," Saint-Simon proclaimed that an industrial society would always be governed by an educated elite and professionals—doctors, engineers, chemists, accountants—who would employ their skills according to the objective needs and who would be obeyed not because they are masters but because they have technical competence.


1See Saint-Simon, Social Organization, the Science of Man and Other Writings; and Bell, "Post-Industrial Society," pp. 120-127. As Bell points out, for Saint-Simon the industrial society was to be contrasted to a military society which was organized around plunder, waste, and display. In the industrial society, Saint-Simon saw four different dimensions: (1) it was concerned with production; (2) its methods were those of order, certainty, and precision; (3) it would be organized by "new men": engineers, industrialists, planners; and (4) it would be based on knowledge. Ibid., p. 124.

2Bell, "Post-Industrial Society," p. 124. This would accomplish what Gullic considers the most difficult task of leadership—not commands but the development of the desire and will to work together for a purpose in the minds of those who are associated
If there was a job to be done or a function to be performed, in an industrial society there would also be a specialist with the requisite skill and expertise to do it. The vision here was that in such a society it was no longer the rule over men but "the administration of things, that is, the substitution of rational judgement for politics [which] is the hallmark of technocracy." The industrial society seeks solutions not in emotional simplifications but in the use of man's accumulated social and scientific knowledge.

The industrial society attempts to organize its members around functional efficiency, and to choose a more rational course of action to achieve the narrowly-defined objectives. Problems in any activity. Such an endeavor would depersonalize the giving of orders. As Follett puts it, "One person should not give orders to another person, but both should agree to take their orders from the situation." See Luther Gulick, "Notes on Theory of Organization," in Papers on the Science of Administration, ed. by Luther Gulick and Lyndall F. Urwick (New York: Institute of Public Administration, Columbia University, 1937), p. 37; and Henry C. Metcalf and Lyndall F. Urwick, eds., Dynamic Administration, The Collected Papers of Mary Parker Follett (New York: Harper & Brothers, 1941), pp. 57-63. Also, this was the basis of Taylor's concept of functional foremanship in which he conceived that influence and leadership should be based on technical competence rather than on any other criteria, and that "status must be based upon superior knowledge rather than nepotism and superior financial power." See Frederick W. Taylor, Scientific Management (New York: Harper & Brothers, 1947), p. 10.

Bell, "Post-Industrial Society," p. 127. The late President John F. Kennedy also expressed similar thoughts in a conversation with the French author, Andre Malraux. In the twentieth century, Kennedy said, the real issue was the management of a highly industrialized society—a problem not of ideology but of administration. See Arthur Schlesinger, Jr., A Thousand Days: John F. Kennedy in the White House, Fawcett Crest Books (Greenwich, Conn.: Fawcett Publications, Inc., 1965), p. 582.
are defined in terms of optimization where elements involved are considered in the frame of production function, input-output ratio, marginal efficiency of capital, programming constraints, etc., and not in the frame of ideology. In fact, the images of ideology are entirely irrelevant when problems are examined rationally. Even the social problems are seen less as a consequence of deliberate evil and more as the unintended by-products of both complexity and ignorance.1

B. The Technocracy of Scientific Management

In an industrializing society, there is no better mode than the technocratic one in which ends are defined in terms of efficiency and output. These ends exist in themselves because that is what the technocracy is concerned with: the pursuit of rationality. For Frederick W. Taylor, the founder of scientific management, any notion of ends other than production and efficiency of output was nonexistent. To Taylor and his disciples, the rules of thumb by which a machinist performed on the job in choosing the machine speeds, tools, and methods of work were whims or hunches inherited from the pre-industrial artisan days.2 By

1Ibid., pp. 125-127. Also, see Brzezinski, Between Two Ages, pp. 111-122. In many cases, as Kristol points out, these problems might have been caused even by social reforms. No social reform ever works out exactly as its proponents hoped it would, and there are always unanticipated costs and unforeseen consequences. See Irving Kristol, "Social Reform: Gains and Losses," Wall Street Journal, April 16, 1973, p. 14.

2Bell, "Technocracy and Politics," pp. 12-13. The first principle of Taylor's Principles of Management was to "develop a science for each element of a man's work, which replaces the old
insisting on studying the work and work methods, they translated
the technocratic mode into the actual practices of the industry
and created the cult of efficiency that revolutionized the in-
dustrial life of the early decades of this century.¹

If Taylor was the founder of the technocracy of scientific
management, he was also, thereby, the founder of the way out of
an apparently hopeless impasse of the nineteenth-century class
war between the capitalist exploitation of the laboring man and
the proletariat dictatorship. More than anyone else, Taylor laid
the foundation of affluence for the common man of the West.²

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¹At the center of this efficiency cult was Taylor's program
of industrial management. All the various shades and sides of
efficiency were contained within Taylor's system. His zeal for
efficiency was so pervasive that it became the domineering theme
of the Progressive Era of 1890-1920. During this era the emergence
of efficiency was seen as a secular great awakening, and the gospel
of efficiency was preached to all. Three great minds of this era
were affected by scientific management: Louis D. Brandeis, Herbert
Coly, and Walter Lippmann. Considered together, these three men
reveal some of the different layers of that movement of efficiency.
See Samuel Haber, Efficiency and Uplift: Scientific Management in
the Progressive Era, 1890-1920 (Chicago: University of Chicago

²He fashioned his methods after the exact sciences—experiment,
measurement, generalization—in the hope of discovering laws
of management which, like the laws of nature, would be impartial
and above class prejudice. He proposed a neat, understandable
world in the factory, devoid of any ideological content. It was
an organization of men whose acts could be planned, coordinated,
and controlled under continuous expert direction. Taylor's sci-
entific standards and "one best way" were indeed attempts toward
The immediate result of scientific management was a revolutionary cut in the costs of manufactured goods, and what had been—and still are in the underdeveloped world—the luxuries inaccessible to all but the rich, such as automobiles or household appliances, rapidly became available to the broad masses of the Western world. This was made possible, for the first time in the industrial wage history, concurrently with sharp increases in wages. As a result of the technocracy of Taylor, productivity became manageable. The technologist could raise productivity, if not create it. Taylor's technocracy also made it possible to raise the standard of living for the whole economy, a phenomenal event that had been totally impossible—indeed, unimaginable—at any earlier time in history.

establishing natural laws of work that would remove the basic source of antagonism between worker and employer: the question of what is "fair" or "unfair." See Taylor, The Principles of Scientific Management, p. 10; Bell, "Technocracy and Politics," p. 13; and Drucker, Technology, Management and Society, p. 29. Furthermore, scientific management is one American concept that has penetrated the entire world, and, as Drucker says, "it may well be the most powerful as well as the most lasting contribution America has made to Western thought since the Federalist Papers." See Drucker, The Practice of Management, p. 280.

1Drucker, Technology, Management and Society, p. 79. As an example of cost-cutting, by scientifically studying and analyzing the motions of bricklayers, Frank B. Gilbreth, one of the principals of the scientific management movement, increased worker capacity from 120 to 350 bricks per man-hour by the turn of the century. See George, The History of Management Thought, p. 97.
C. Technocracy and Productivity

For the first time in the history of societies, the rise in productivity made it possible for modern Western society to steadily increase its wealth, and to improve the standard of living by peaceful means. Almost all previous societies had sought wealth by war, plunder, expropriation, tax-farming, or other means of extortion. This is the basic difference between the industrial spirit and the military spirit. Earlier military societies were organized around plunder, waste, and a display of heroics. In contrast, the industrial societies emphasized work, production, rationality, and economy. In military societies, work was subordinated to war and the warrior ruled; in the industrial society, life would become pacific and the producer would rule.¹

In the idiom of game theory, economic life no longer was a zero-sum game as it had been in the military society, where one group of winners could benefit at the expense of another group of losers. Productivity meant the ability to gain a more than proportional output from a given expenditure of capital or a given

¹Nearly all the major theorists of the industrial societies have considered this to be the basic difference between the industrial spirit and the military spirit. See Bell, "Technocracy and Politics," pp. 14-15. This is not to suggest that a demand for the heroic is irrational; without it, as Boulding suggests, life would be deprived of a great deal that makes it worth living. Furthermore, it is the disagreeable fact of scarcity itself (which is the very basis of rationality) that generates a demand for the heroic. What is needed is a creative tension between these two spirits. See Kenneth E. Boulding, "The Basis of Value Judgement in Economics," in Human Values and Economic Policy: A Symposium, ed. by Sidney Hook (New York: New York University Press, 1967), p. 67.
exertion of labor. In an industrial society, economic life could be a non-zero-sum game where everyone could end up being a winner.¹

The theme of productivity can be linked originally to the industrial revolution and, in particular, to the discovery of new forms of power, mechanical or electrical, hitched to an engine. Productivity as a concept, however, became possible only through the technocracy which organized machine production around a variety of innovations.²

Technology rested on the assumption that knowledge rather than manual skill was the fundamental productive resource. The extent of the substitution of knowledge for manual effort as the productive resource in work was perhaps the greatest change in the history of work. It initiated the eventual inevitability of the "knowledge worker" and of systematic mental training rather than skill in the sense of exposure to experience that would prepare the individual for the work.³

¹Of course, there would be different, and not necessarily equal, gains among the participants. See Bell, "The Corporation and Society in the 1970's," p. 9.

²The first major example of innovation in the twentieth century was the concept of mass production. It is true that all the major technical inventions necessary for the function of a mass production plant were already in existence long before the first decade of the twentieth century when Henry Ford organized the first such plant to produce the model T automobile. Ford's contribution lies in the innovation that provided "a technical solution to the economic problem of producing the largest number of finished products with the greatest reliability of quality at the lowest possible cost." Its test as an innovation lies in its impact on the way people live, which has been profound. See Drucker, Technology, Management & Society, p. 09.

³Ibid., pp. 80-81.
Of all the members of the technocracy, no combination was more responsible for the emergence of the industrial order than the engineer and the economist-accountant. These two were united by the common theme of efficiency. In the pursuit of efficiency, the engineer was busy designing and planning a machine performance that would be the "one best way" to extract maximum output within a given physical layout and resource allocation.¹ On his part, the economist-accountant was busy calculating the monetary costs within a framework of profitability indicators to arrive at an optimal resource allocation for organizing the economics of the industrial life.²

One of the earliest proponents of the economics of efficiency was Adam Smith, who, in his so-called "invisible hand" proposition, suggested that every individual, by pursuing his own ends, helps society as a whole. In pursuing his own interests, every individual "necessarily labours to render the annual revenue of the society as great as he can... and he frequently promotes the interest of society more effectually than when he

¹This was indeed the basic theme of the whole scientific management movement. No one personified this better than Frank B. Gilbreth, who questioned almost everything in sight as to its feasibility and applicability, and thus unwittingly started on a lifetime search for the "one best way" of performing any given task. See George, The History of Management Thought, pp. 96-98; Milton Nadworny, "Frederick Taylor and Frank B. Gilbreth: Competition in Scientific Management," Business History Review, XXXI (Spring, 1957), 28-32; and Edna Yost, Frank & Lillian Gilbreth: Partners for Life (Brunswick, N. J.: Rutgers University Press, 1949).

really intends to promote it."¹

In what may appear to be a simple assertion of faith, Smith put forward certain basic conditions for a free and productive society: individualism, rationality, perfect information, and rational choice. Above all, for Smith, the good of society was the aggregate of individual utilities. This proposition also had much to do with transforming the economic life from a zero-sum game to a non-zero-sum game. Implicit here is the basic foundation of industrial economic life: that in a free exchange, both parties to a transaction could gain.²

D. Rational Means and Plural Ends

Through the technocracy of industrial society and its major themes of productivity and efficiency, there has emerged what may be called an economizing spirit. The perennial problem, particularly of an industrial economy, is the deployment of limited resources to attain maximum results. Economizing may be seen as the science of an optimum allocation of scarce resources among competing ends.³ It can also be seen as the essential tool of the reduction of waste as measured by the monetary framework of cost accounting. The conditions of economizing are the same as those laid down by Smith in his "invisible hand" proposition:

a free market mechanism as the arbiter of allocation, and a fluid price system which is responsive to the shifting patterns of market forces. In this, Smith laid the foundation for economic rationality.

To achieve the greatest value of narrowly defined individual goods, a free market mechanism is indeed the best vehicle because it does not need any clearly defined collective ends for the society as a whole. The ends of the collective life themselves are never given; rather, they are seen as multiple or varied, to be chosen freely by the members of society. However, if the collective ends are not specified in an industrial society organized around the economizing mode, they are assumed to be fulfilled whenever the individual aims of the members of society are satisfied and aggregated through the free market.¹

¹Bell, "The Corporation and Society in the 1970's," pp. 10-11. This has been the basic theme behind the much celebrated notion of consumer sovereignty. The free market is viewed as a mechanism by which the individual imposes his will on the producer. Even in such an oligopolistic and advertising-ridden business as the automobile industry, "there is always a presumption of consumer sovereignty in the market economy." See Franklin M. Fisher, Zvi Griliches, and Carl Kaysen, "The Costs of Automobile Model Changes Since 1949," The Journal of Political Economy, LXX (October, 1982), 434. Samuelson also suggests the same thing but applies it to the entire economy. He writes that what will be produced is determined by the votes of the consumers, "not every two years at the polls but every day in their decision to purchase this item and not that." See Paul Samuelson, Economics: An Introduction (7th ed.; New York: McGraw-Hill Book Company, 1967), p. 42. Ferguson and Kreps are more categorical when they assert that in the final analysis, "consumers collectively decide what industry is to produce. The choices of consumers provide the basis on which business makes its decisions." See C. E. Ferguson and Juanita M. Kreps, Principles of Economics (2nd ed.; New York: Holt, Rinehart and Winston, 1965), p. 80. Also, see C. Lowell Harris, The American Economy (4th ed.; New York: Richard D. Irwin, Inc., 1962), p. 380. By one account these are the most widely
In pursuit of efficiency and productivity, the economizing mode indeed provides a dazzling array of the rational means that would best satisfy a given end. These rational means include what may now seem quite simple concepts, such as rational division of labor, specialization of function, complementarity of relations, and more. They also include highly sophisticated and computerized techniques, such as mathematical programming and simulation which provide optimal solutions to the complex problems of modern economic life.

What is so distinctive about the economizing mode, as formulated by Adam Smith, is that while its means are rational, its ends are plural and accomplished only through the mechanism of a diffused and free market where there are no focal points of decision-making.¹ The fundamental basis of economizing is the principle of maximizing behavior, which, in short, assumes that given a choice people always choose what they think is best for them at a given time. The theoretical virtue of the free market mechanism is that it coordinates human interdependence in some optimal fashion so that the maximizing behavior is expressed in the preferences of buyers and sellers engaged in an exchange situation.²

¹Bell, "Technocracy and Politics," pp. 21-23.

²In a similar vein, Samuelson suggests that even the behavior of Newton's falling apple can be interpreted as if it were a solution of an appropriately formulated maximizing or minimizing problem. See Paul Samuelson, "Maximum Principles in
The phenomenon of exchange as organized around maximizing behavior is the heart of the economizing mode. The most important single parameter in any exchange is the ratio of exchange or the price mechanism. In a free society, the price mechanism can be manipulated to guide individual behavior into a socially acceptable direction without coercion.¹ This also is the central theme of Adam Smith's invisible hand proposition. The exchange system organized around a free market mechanism and guided by maximizing behavior is the one effective way to reconcile individual liberty with the overall social goals.²

B. Measurement Limits in an Economizing Mode

1. Measurement of Economic Goods Only

Economizing as a process is a product of scarcity which forces people to become the decision-makers. If there were no scarcity, there would be no necessity to make any choices.³ The


¹Boulding, "Is Economics Obsolescent?" p. 41.


³Here economics emerges, in Boulding's words, "as a generalized theory of choice," arising primarily because of scarcity, which forces man to make decisions. The economic man, similarly, is a generalized chooser and decision-maker, who evaluates his trade-offs in sacrificing a little of this for a little of that. See Boulding, "Is Economics Obsolescent?" p. 39. Both Lord Robbins and Samuelson have similarly viewed scarcity as the
unqualified scarcity, which has been made the criterion of economic activity, has also been its principal dilemma. The best things in life are free: clean air, beautiful scenery, pure water, sunshine, satisfaction in work and in meeting friends, etc. These are free goods either because they are so abundant that there is little or no cost, or because they are not appropriaire or saleable.¹

Since the provision of such free goods can be taken for granted, there is no need to make any choices. Consequently, they stay outside the cost accounting framework. Even though such free goods are indispensable to human welfare, they do not amount to much in the bookkeeping of economic wealth. Furthermore, the bookkeeping of the economic wealth is again in unidimensional measurement, that is, in precise monetary calculation, where the terms of trade—the prices—are by necessity stated and recorded in monetary terms only.²


²For example, Chambers' functional definition of accounting views it as a "method of retrospective and contemporary monetary calculation . . . ." See Chambers, Accounting, Evaluation and Economic Behavior, p. 99. Similarly, Dewing suggests that accounting chooses to neglect all aspects and quantities of the material things with which it deals, except their mere correspondence to money value. This is because, as with all mathematical sciences which assume a correspondence between numbers and material things, accounting is essentially abstract. See Arthur Stone Dewing, The Financial Policy of Corporations (rev. ed.; New York: Ronald Press, 1926), pp. 453-454. One may wonder why there is such thorough dependence on the unidimensional monetary calculation, particularly when, as Sweeney said so well, "the
J. Externalities Are Not Accounted For

It is characteristic of the juggernaut of technological growth to generate extensive spillovers of effects which eventually become costs borne directly by "third parties" or distributed among the society as a whole. Technological progress generates multiple disruptive effects. More important, such

truthfulness of accounting depends largely on truthfulness of the dollar—and the dollar is a liar. For it says one thing and means another." In monetary calculation, the accountant reduces what is essentially a multidimensional reality to a one-dimensional figure. He does so because the accountant's task is essentially an impossible one, and he is doing the best he can do under the circumstances. This is why more often accounting becomes ritualistic because the "ritual is always a proper response when a man has to give an answer to a question, the answer to which he cannot really know." See Henry Whitcomb Sweeny, Stabilized Accounting (New York: Harper & Row, Publishers, 1936), p. xii; and K. E. Boulding, "Economics and Accounting," p. 286. It should be added, however, that attempts are being made to escape the unidimensionality of accounting. For example, see Yuji Iijiri, The Foundations of Accounting Measurement: A Mathematical, Economic and Behavioral Inquiry, Prentice-Hall International Series in Management (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1967), ch. 5; and A. Charnes, C. Colanoni, W. W. Cooper, and K. O. Kortanek, "Economic Social and Enterprise Accounting and Mathematical Models," The Accounting Review, XLVII (January, 1972), 85-108.

Pigou was one of the earlier economists to discuss these "third-party" effects which, in Pigovian terminology, were external to the immediately involved parties. Since these external effects (both positive and negative) are so diffused, it is difficult to determine the identity of their individual or organizational recipients to include them in some cost-benefit matrix. Among others, Pigou cites the examples of uncompensated services, such as afforestation, street lamps erected at the doors of private houses, the prevention of smoke from chimneys, and the resources devoted to the fundamental problems of scientific research and to the perfecting of inventions and improvements in industrial processes. Here in each case the services or disservices are rendered to the third parties which are not in the immediate cost-benefit matrix, and the "payment cannot be exacted from the benefited parties or compensations enforced on behalf of injured parties." See A. C. Pigou, The Economics of Welfare (4th ed.; London: Macmillan & Co., Ltd., 1932), p. 185. See also Francois Bourricaud, "The Paradoxes of Welfare," pp. 43-60.
progress introduces differences between those who bear it and those who benefit by it, with a resulting increase in the power of the latter.¹ The dilemma of growth is that this inequality is so essential to progress that it is impossible to eliminate it, at least not immediately, without eliminating the progress itself.²

The present framework of cost accounting which facilitates the maximizing behavior of the economizing mode does not take into account the externalities or so-called neighborhood effects: the smoke nuisance, river pollution, the private garden in the public view, and the like. The price mechanism of the free market can reflect exclusively the monetary trade terms of the appropriable items, and nothing else.

¹And to start a vicious circle, since growth has been a principal goal of the industrial society, this difference "will be great where power is great." See John Kenneth Galbraith, "Power and the Useful Economist," The American Economic Review, LXIII (March, 1973), 7.

²As Bourricaud explains it, technological progress produces two kinds of effects: one of exclusion by differentiation, as there is a difference between those who bear it and those who benefit by it; and the other of competition by means of which those excluded try to catch up with the rest of the crowd, as evidenced by the ostensible purposes for which people emphasize education in the industrial societies. See Bourricaud, "The Paradoxes of Welfare," p. 55.

³Boulding refers to these externalities as diseases of the market and suggests that they can perhaps be corrected by regulation, countervailing power, or tax system. He warns that diagnosis and the cure of these ills require "an information system of delicacy that we do not possess." See Boulding, "The Basis of Value Judgments in Economics," p. 63.
3. Integrative Factors Are Not Accounted For

The principal theme of the economizing mode in the organization of life has been that exchange is a more important source of power than threat. This has also been the historical significance of modern Western capitalism. However, the smoothly functioning price mechanism and the perfect exchange system, even of a free market, cannot provide an answer to all the critical social ills. There still remains a residue of elements in social relations that cannot be accounted for by exchange. Moreover, the market itself is subject to certain pathological disorders of its own: general deflation or inflation, monopoly rigidities, meaningless competitive fluctuations, etc.¹

The exchange system of the economizing mode thus continually needs to be supplemented by what Boulding calls the "integrative system" involving such things as status, respect, love, honor, community, identity, legitimacy, and so on. Without integrative relationships, neither threat nor exchange can maintain a continuing relationship. Without integrative legitimacy, both exchange and threat systems are self-defeating and self-limiting, and are incapable of creating roles that would sustain society. These relationships are quite complex and reciprocal, and usually remain outside the cost accounting framework of the economizing mode.²

¹Boulding, Economics as a Science, p. 10.

²However, it should be noted that the integrative system can be equally faulted with other ills, the most important being the lack of feedback and control. Thus, if the Ford Motor Company,
In this respect, the process of economic growth, which is one of the major goals of an economizing mode, is inadequately understood. If the integrative system of a country fails to develop concepts of mutuality, trust, and community beyond the confines of the family or the small intimate group, its attempts toward economic development are bound to fail. More than the elements of technology, such as physical inputs and outputs, dams, or roads, and more than the elements of economics, such as stabilization and trade, investment and consumption, money and budgets, what is required in the process of economic growth are such subtle, integrative elements as motivation and morale, conflict management and political legitimacy, family structure and religious beliefs.¹

¹Ibid. Also, see Bauer, Dissent on Development.
XI. THE SALIENT TRENDS OF THE POST-INDUSTRIAL SOCIETY

A. Toward the Economy of Spaceship Earth

The basic tenet of the free market is that the price system and maximizing behavior will provide an efficient allocation of resources within the framework of demand and supply. However, as Veblen pointed out, the direction of economy is ultimately provided by the value system of the culture in which the economy is embedded. Such a value system in an industrial society, regardless of its ideological predilections, usually centers around the desirability of economic growth where "the production, by its overpowering importance and its ineluctable difficulty is the central problem of our lives."  

What is more crucial is that the cultural values of Western society, particularly American society, increase the private consumption of economic goods. This has led to the major distortions and contradictions in the distribution of goods and services. Men often view frivolous goods with pride, but consider

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1 This section is adapted largely from the related writings of Kenneth E. Boulding. These ideas first originated with him, and I have relied heavily on his writings, particularly a paper presented at the Sixth Resources for the Future Forum on Environmental Quality in a Growing Economy in Washington, D. C. on March 8, 1960. The paper is entitled, "The Economics of the Coming Spaceship Earth," and is collected in Boulding, Beyond Economics, pp. 275-287.


public services at best to be a necessary evil and at worst "a malign tendency against which an alert community must exercise eternal vigilance."\textsuperscript{1}

Overly occupied with the production of private consumption goods which are in greater demand because they are embedded in the value system, the industrial economy creates a serious imbalance between public goods and private goods.\textsuperscript{2} Excessive pre-occupation with the production of private consumption goods in an economizing mode is grounded in the assumption that the source of

\textsuperscript{1}Ibid. Galbraith illustrates this contrast in the following passage:

The family which takes its mauve and cerise, air-conditioned, power-steered, and power-braked automobile out for a tour passes through cities that are badly paved, made hideous by litter, blighted buildings, billboards, and posts for wires that should long since have been put underground. They pass on into a countryside that has been rendered largely invisible by commercial art. (The goods which the latter advertise have an absolute priority in our value system. Such aesthetic considerations as a view of the countryside accordingly come second. On such matters we are consistent.) They picnic on exquisitely packaged food from a portable icebox by a polluted stream and go on to spend the night at a park which is a menace to public health and morals. Just before dozing off on an air mattress, beneath a nylon tent, amid the stench of decaying refuse, they may reflect vaguely on the curious unevenness of their blessings. Is this, indeed, the American genius?

\textsuperscript{2}In a similar vein, popular psychology aided by vote-mongering politicians does not view taxes as the necessity for purchasing public services that an individual cannot purchase for himself, but as money "taken away from me by them." See Bell, "The Corporation and Society in the 1970's," p. 14. Also, see Anthony Downs, "Why the Government Budget Is Too Small in a Democracy," \textit{World Politics}, XII (July, 1960), 540-563.
human welfare is commodities. In these terms, the greater welfare requires more productive workers who are institutionally molded to the pursuit of producing more in order to consume more. Consequently, "the rate of increase in income and output in National Income and Gross National Product . . . remains the all but exclusive measure of social achievement."  

The goals of economic growth in an industrial society derive largely from the image which man in such a society has of himself and his environment. In the last few thousand years, the human race has been expanding almost continuously in its total population and in its rate of utilization of the earth's resources. Primitive men, and to a large extent men of early civilizations, imagined themselves to be living on a virtually illimitable plane. After the unprecedented and accelerated exhaustion of resources as a result of the growth of the last 100 years, we have come to

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an end of the geographical expansion of modern times. In fact, we are just a hundred years short of the total drying-up of our resources: "there are no empty lands, and the view of earth from space dramatizes the image of man as inhabiting a small, closed spaceship, destination unknown and resources limited."¹

The transformation of man's image of his environment from an open earth to a closed spaceship also calls for some radical adjustment of his economic behavior. Circumscribed within a closing circle with an exploding population in the face of depleted resources, and with the limited waste-absorbing capacity of the soil, water, and atmosphere, we can no longer afford our modern linear economy. Such a linear economy extracts fossil fuels and ores at one end, transforms them into commodities, and ultimately into waste products which are spewed out the other end into the pollutable reservoirs.

This inherently suicidal process must come to an end,² because in a spaceship earth there are no mines or sewers. Ironically, as in a traditional village economy, everything has to be recycled, and man has to find a place in the middle of this cycle.


²The identity of finitude is what makes the concept of a spaceship earth distressingly irrefutable. Anything that grows into a finite space will eventually fill it and at the end will fill it rapidly, especially if its growth is at a constant rate. See Garrett Hardin, Exploring New Ethics for Survival: The Voyage of the Spaceship Beagle (New York: Viking Press, 1972), for further biosociological extension of this argument.
The spaceship earth simply repeats the cycle on a much larger scale and possibly on a higher level.  

The cyclical ecological system of the spaceship economy must be capable of continuous reproduction of material form even though it cannot escape having inputs of energy. Against the very grain of an open earth industrial economy, the process of consumption will have to be sharply curtailed. "In the spaceship economy, consumption is no longer a virtue but a vice; and a mounting G.N.P. will be regarded with horror." Unlike the industrial economy where both expanding production and consumption are actively sought after, the spaceship economy would measure its success by the nature, extent, quality, and complexity of the total capital stock, including the state of human capital.

The economic life of the open earth industrial society is organized around the production-consumption mix. In a spaceship earth, it would have to be organized around the maintenance-distribution mix. Stock maintenance would be essential, and technological advances would be geared toward conservation and not consumption, so that a rich variety of stock capital could be maintained without much production. Promise of growth would have

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2 Ibid. Some have suggested renaming the GNP as Gross National Pollution, and Boulding proposed that it be changed to Gross National Cost. See Gurley, "The State of Political Economics," pp. 60-61.
to be replaced by what has been called "the stationary-state," in which distribution, and not production, would be the central theme. Such a "stationary-state would make fewer demands on our environmental resources, but much greater demands on our moral resources."¹

As in all spaceships, sustained life requires that a meticulous balance be maintained between the life-support capability of the vehicle and the demands made by the inhabitants of the craft. Until quite recently, those demands have been well within the capability of the ship, both in terms of its ability to supply the physical and chemical requirements for continued existence and to absorb the waste products of the voyagers. . . . It is only in our time that we are reaching the ceiling of earthly carrying capacity, not on a local but on a global basis. Indeed . . . we are well past that capacity, provided that the level of resource intake and waste output represented by the average American or European is taken as a standard to be achieved by all humanity. To put it bluntly, if we take as the price of a first-class ticket the resource requirements of those passengers who travel in the northern hemisphere of the spaceship, we have now reached a point at which the steerage is condemned to live forever—or at least within the horizon of the technology presently visible—at a second-class level; or at which a considerable change in living habits must be imposed on first class if the ship is ever to be converted to a one-class cruise.²

¹Herman E. Daly, "Toward a Stationary-State Economy," in The Patient Earth, ed. by John Harte and Robert Socolow (New York: Holt, Rinehart, and Winston, 1971), pp. 236-237. However, it should be noted here that this stationary state may be rarely achievable. If it can be argued that the present period of human history is a great rarity with its unprecedented mutation, change, and pathological growth, it can also be argued that the stationary state is almost equally rare. See Kenneth E. Boulding, "The Gospel of St. Malthus," review of Exploring New Ethics for Survival, by Garrett Hardin, in The New Republic, September 9, 1972, p. 25. Also, see Herman E. Daly, "The Canary Has Fallen Silent," New York Times, October 14, 1970, p. 43.

This certainly does not mean that we cannot have an affluent society, that is, if by affluence we mean good health, creative activity, beautiful surroundings, love, joy, art, and so on. Rather, this affluence . . . will have to be combined with a curious parsimony. Far from scarcity's disappearing, it will be the most dominant aspect of the society. Every grain of sand will have to be treasured, and the waste and profligacy of our own day will seem so horrible that our descendants will hardly be able to bear to think about us, for we will appear as monsters in their eyes.¹

B. Inadequacy of Our Present Institutions

The germane issue here is whether the institutions around which the industrial society is organized would survive any longer in the post-industrial society of the spaceship earth. Furthermore, what kind of social and economic institutions would it take to organize the life in a post-industrial society? Can the system of private property, wide freedom of choice of location and occupation, reasonably fluid market system, and the like, which we have long taken for granted as principal characteristics of a capitalistic industrial order, remain with us in a spaceship economy? The institution of the market and its price mechanism which have provided us the relative luxury of reconciling our personal freedom with social control may have reached their limits. Along with

other social, economic, and religious institutions, they were devised in a world which was quite unlike ours and, indeed, they may be quite inadequate to organize life on a closed spaceship earth.1

It should also be pointed out that there is no panacea in a tightly controlled planning system, either, as exemplified in the performance of the socialist societies in the past fifty years. Their performance has revealed that when considering the diseconomies of scale, inflexible hierarchies, distortion of the reward system, and other defects, the capitalist societies operating under a loose market framework and the centrally planned socialist societies have much in common. Above all, when it comes to the pollution of the environment and the exhaustion of resources, "the pressures of a Plan are just as hard on the environment as the pressures of the market."2

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1Kenneth B. Boulding, "Toward a Twenty-First Century Politics," The Colorado Quarterly, XXI (Spring, 1972), 37. This theme of institutional change was aired recently at a symposium held to commemorate the 250th anniversary of Adam Smith, the father of the "invisible hand theory." According to this great laissez-faire economist, men freely pursuing their own economic gain are led by an invisible hand to increase the wealth of nations. Government intervention, he argued, only gums up the works to the restriction of the general good. Now, two centuries later, this was too much even for Arthur Burns, once a believer in Smith's theories and currently the chairman of the Federal Reserve Board, who found it necessary to revise his ideas about the proper role of the government in specific economic matters. He commented, "Experience is a demanding teacher, and my respect for it has led me at times to favor governmental actions that I abhorred in my youth." See "An Economic Mecca in Scotland: The Hometown of Adam Smith," New York Times, June 7, 1973, p. 77; and Neil Ulman, "Bringing Back Adam Smith Just for a Day," Wall Street Journal, June 8, 1973, p. 8.

C. Duality of the Technological Development

No other revolution created as much radical change in man's way of life as the contemporary technological revolution. Erupting in all conceivable dimensions--economic, social, etc.--it is perhaps "the most revolutionary change that man has ever lived in."¹ Unlike the industrial revolution that shook Europe and the world more than a century ago, the modern post-industrial revolution is not territorial, but spatiotemporal.² The industrial revolution was territorially confined, and it only gradually spilled over to affect other societies. In contrast, the modern technological revolution has rapidly created a common world civilization.

In the West, where it grew out of the indigenous culture, it has challenged and overthrown deeply rooted social and political institutions. In the East, it is continually corroding and dissolving history, tradition, culture, and values, no matter how old, how highly developed, or how deeply cherished and loved.³


²Brzezinski, Between Two Ages, pp. 106-108.

Although the world is on the eve of a transformation more dramatic in its historic and human consequences than that wrought either by the French or the Bolshevik revolutions, the social revolution now taking place, especially in America, is not proclaimed by any victorious revolutionaries. It is simply happening very quietly. More than a revolution in the conventional sense, it is a novel metamorphic phase in human history. Under the muffled metamorphosis of the technological revolution, all the highly industrialized countries are now moving into the first stages of post-industrialism. The United States in particular has become "a transitional society undergoing a profound and painful social transformation."¹

If the most obvious aspect of this revolutionary transformation is a science-based technology, somewhat less obvious is the unevenness of the technological change. The contemporary American society is now beginning to be shaped by the impact of this technology, particularly by computers and telecommunications. Its industrial process is no longer the principal determinant of social change, altering the mores, the social structure, and the

¹Bertram M. Gross, "Some Questions for Presidents," in A Great Society? ed. by Gross, p. 315. Furthermore, viewing from a longer perspective, Brzezinski notes that both the Bolshevik and French revolutions merely scratched the surface of the human condition. The changes they precipitated involved alterations in the distribution of power and property within society; they did not affect the essence of individual and social existence. He contends that life—personal and organized—continued much as before, even though some of its external political forms were substantially altered. See Zbigniew Brzezinski, "America in the Technetronic Age: New Questions of Our Time," Encounter, January, 1968, pp. 16-26.
values of society, as in the past.\(^1\)

Thus, if in the area of "mobiletics"—that is, the movement of information, things, and energy over space and time—the United States has a dazzling array of telestars, computers, supersonic airplanes, and electric power grids, in the areas of construction, city planning, traffic safety, integrated transportation, prevention of air and water pollution, pedagogy, nutrition, penology, mental illness, and social statistics, her current technologies are unbelievably backward, poverty-stricken, and myopic.\(^2\)

As these "mobiletics" and the functions of the space-military sector absorb an enormous proportion of our intellectual, research, engineering, and growth resources, the civilian portion of the economy has been severely affected by the lack of resources.\(^3\)

\(^1\)Brzezinski, "America in the Technetronic Age," pp. 10-22.


Further, as Boulding observes, the relations between the world superculture produced by the network of electronic communication and the more traditional national and regional cultures of the past provide the great question mark of the next fifty years. See Kenneth E. Boulding, "Expecting the Unexpected: The Uncertain Future of Knowledge and Technology," in Prospective Changes in Society by 1980, ed. by Edgar L. Morphet and Charles O. Ryan (New York: Citation Press, 1967), pp. 199-215. Reading about this dichotomous aspect of man's technological accomplishments, one is reminded of the brilliant oration of the Devil in Shaw's Man and Superman, where the sobering suggestion is made that this has always been the case. See Bernard Shaw, Four Plays by Bernard Shaw (New York: Washington Square Press, 1965), pp. 380-382.

\(^3\)For example, Melman estimates that some 60 per cent of the total research and development effort is channeled into space-military operations. See Seymour Melman, Our Depleted Society (New York: Holt, Rinehart and Winston, 1965), pp. 13-47. The technological development of the civilian sector of the economy
This widespread technological malaise has created a dual society,
and within it a dual economy, where one part lives in the rapidly-
moving world of science-based post-industrial technology, and the
other in an underdeveloped realm of human, technological, and
scientific backwardness.\(^1\)

Following is a summary of recent changes in the structure
and performance of the American society.\(^2\) Because of the duality
of the technological development, these changes also have been
taking place at uneven, varying, and, in some cases, unprecedented
cannot be adequately accomplished because the resources are devoted
to what some call the "relatively sterile activities of the space-
military complex." This assertion is usually argued against by
stating that there are in fact considerable spillovers from the
space-military industry into the civilian economy. Boulding notes
that this may have had some truth to it, as exemplified by the ad-
vanced civilian jet aircrafts. However, he warns, these spillovers
are declining, mainly because the space-military complex is now at
least a whole technological generation ahead of the civilian econ-
omy. Furthermore, this technological chasm between two sectors
effectively prevents the transfer and spillover benefits. A re-
cent study of the Denver Research Institute, for instance, sug-
gested that the spillover effects from the space-military operation
in Colorado into the civilian economy were very small. See
Boulding, "The Great Society in a Small World," pp. 215-216; and
Melman, Our Depleted Society, pp. 114-130, 240-249.

\(^1\)See Gross, "Some Questions for Presidents," pp. 315-317;

\(^2\)This discussion of changes has been developed largely
with the help of the papers collected in A Great Society ed. by
Gross. Of particular importance are the following upon which I
have relied: Bertram M. Gross and Michael Marien, "The President's
Questions--And Some Answers," pp. 3-31; Robin M. Williams, Jr.,
"A Model of Society--The American Case," pp. 32-56; Daniel Bell,
"The Adequacy of Our Concepts," pp. 127-164; Peter F. Drucker,
"New Political Alignment in the Great Society," pp. 102-186;
Kenneth E. Boulding, "The Great Society in a Small World--Dampen-
ing Reflections from the Dismal Science," pp. 209-226; and
rates. Furthermore, these changes also provide evidence of the progressive emergence of a society that increasingly differs from the industrial one in a variety of economic, political, and social aspects.

D. From the Production of Goods to the Provision of Services

Owing to the unusual breakthrough in agricultural technology and the consequent phenomenal increase in agricultural productivity, the major structural change in employment from agriculture to industry was inevitable. Now we have reached another threshold of the technological breakthrough. As a result of automation and the cybernetics of the post-industrial society, conventional manufacturing activity yields to the production of services.

The emergence of a service economy raises a question about existing accounting techniques which are oriented to measure the productivity and rate of economic growth in terms of manufacturing production and the size of the gross national product. A reorientation of accounting techniques will have to be formulated.

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1 In consequence, our problems now correspond to those of an urban civilization. For example, in 1790 only twenty-four cities in the United States numbered more than 2,500, and together they accounted for only 6 per cent of the population. By 1860 the 392 largest cities held 20 per cent of the population; and by the late 1950's, 108 great metropolitan areas from Boston through Washington, D. C., contained 60 per cent of the nation's people. See Heilbroner, The Making of Economic Society, p. 105.

to cope with the inevitability of a greater proportion of services as contrasted with the predominance of goods in the making of the gross national product.

Unless the industrial sector, which is now comprised of giant corporations, is reorganized to adequately reflect the changing composition of the gross national product, the service sector cannot readily develop a unifying sense of mission. Changes will have to be made in the nature and character of the unit of enterprise around which a great deal of the service sector is organized. Also, the basic change in the nature of the work required in a service economy will have to be appreciated and measured.

E. From the Metropolis to the Megalopolis

Nearly 7,000 years ago, the first technological revolution of irrigation provided man with the institution of city government. ² Since then the advances in transportation, from the natural waterways and canals to the railroads and steamships, serving as the strategic variables, have determined the scales of urbanization.

Since World War I, the advance of the internal combustion

¹As Drucker notes, the first great code of law, that of Hammurabi, developed during the first technological revolution, would still be applicable to much of the legal business of the modern society. See Drucker, Technology, Management & Society, pp. 117-121; and E. A. Wallis Budge, Babylonian Life and History (2nd ed.; London: Religious Tract Society, 1925).
engine has made it possible, to an extraordinary extent, to increase and diffuse the power which is a basic requirement of material progress. In so doing, it not only advanced the pace of urbanization, but it also changed the character of urbanization. With the development of trucks and automobiles, the entire economy was literally mobilized. For its very functioning it was dependent upon the existence of wheeled, self-propelled transportation, which is a principal cause of the modern urban phenomenon that comprises the central city, suburb, and metropolis where half of all Americans live.¹

As the suburbs continue expanding to escape from the central city, the new urban complexes have emerged to form a social and economic unit called the megalopolis. Three huge megalopolitan areas around which several regional metropolitan areas have clustered are already visible: on the Northeast seaboard from Boston to Washington; in the Great Lakes region around Lake Michigan; and on the West coast from San Francisco to San José and from Los Angeles to San Diego.²

The conventional geographical concepts of regions as well as state organizations constrained by state boundaries are

¹Heilbroner, The Making of Economic Society, p. 103. It should be noted that because of the existence of the automobile, some 50,000 towns manage to flourish without rail or water connections. By 1960, seven out of ten workers commuted to work, and of the nation's freight tonnage, 76 per cent is no longer moved by rail but by truck. Ibid., p. 104.

²These large megalopolitan areas are converging into twelve or so metropolitan clusters which comprise about 40 per cent of the American population. See Gross, "Some Questions for the Presidents," p. 310.
inadequate and do not have the economic, political, or social sense to deal with the modern urban phenomenon. The development of the megalopolis intensifies the need to organize the common use of water, land, recreational resources, and transportation systems for large areas that cut across the boundaries of existing state and local governments. Thus, the functional concepts of regions will have to be applied for organizing the administrative structures and their accounting measurement techniques.¹

"The definition of what is a region varies not on the basis of geography but on the function to be performed."² To handle the vast problems of the megalopolis, both the administrative structure and the accounting framework that performs the information function would have to be reoriented in terms of a water region, a transportation region, an education region, and the like, where there would be different overlays on the map. This regional overlapping on the map also suggests an overlapping network of organizational clusters. The administrative structure

¹For example, as Bell notes, the existing organization of fifty states makes no economic, political, or social sense. What is the rationale for the boundaries of New Jersey, Delaware, Rhode Island, or Maryland? What is more crucial is that under the constitution such concerns as education, welfare, local services, and the like are powers reserved to the states and municipalities, but these entities are no longer able to perform such services because their tax bases are inadequate, and their administrative structures archaic and inefficient. See Bell, "The Adequacy of Our Concepts," p. 140. See also C. L. Sulzberger, "Challenges to Democracy," New York Times, June 10, 1973, sec. 4, p. 15.

would resemble a loose and heterogeneous system, such as the banking system or the mass communications system. This would amount to a transition from large organizations to complex macrosystems. ¹

F. From White-collar Work to Extended Professionalism

In the industrial society, social leadership shifts from the traditional rural-aristocratic to an urban-plutocratic elite. In the post-industrial society, however, such plutocratic pre-eminence is challenged by the political leadership, which is itself increasingly permeated by individuals possessing special skills and intellectual talents. ² The practical success of the science of decision-making has conclusively proven that there is now, perhaps for the first time in mankind's history, a great deal of immediate power in reason and knowledge. Indeed, the effective mobilization of talent has become an important way to acquire the power. ³


²Brzezinski, Between Two Ages, pp. 10-11. This presupposes that the scientific and technological revolution cannot be led by the working class. The processes of science are quite unlike the traditional activities of the industrial type. As Richta writes, science possesses a peculiar exponential growth potential where every finding is both a result and then a starting point for further research. Furthermore, the stratification system of the new society inevitably will have to emphasize the dominance of the professional and technical classes. See Richta, Civilization at the Crossroads, pp. 217, 245-250; and Bell, "The Post-Industrial Society," p. 155.

³Michael Crozier, "The Lonely Frontier of Reason," in
In the industrial society, education was available for a limited and specific period of time. This education was based largely on written and sequential reasoning, and was oriented toward technical training. In the post-industrial society, however, advanced training would be indispensable as well as continuous throughout the adult working life. The essential condition for survival in the new hyper-rationalist world will depend increasingly on a capacity for abstract reasoning, for which advanced education holds the key.¹

The emergent post-industrial American society is organized around knowledge, skill, and specialization. The growth of the professional-technical class is estimated to rise to about 14,000,000 by 1980. This trend toward professionalization, where much more than the mere color of the collar is involved, will continue to advance, given the deepening specialization, university-based credentialism, and elaborate networks of formal associations. The age group most concerned about careers—young adults from twenty-one to thirty-five—in a variety of specialized jobs and professions, will dominate and constitute the center of demographic gravity at least for the next two decades.²


²Ibid.

What is more crucial in this demographic development is that if we hope to succeed in creating a vast number of new jobs for the young people coming into the labor market during the years just ahead, the country will have to find a great deal of new capital. This need for capital formation will be particularly urgent. On the average, a "knowledge job" in the American economy
G. From Bureaucracy to Organic-adaptive Temporary Systems

Weber was the first and foremost of the structuralist founders to conceptualize an organizational structure. For Weber, the primary source of bureaucratic administration lay in the role of technical knowledge which, through the development of modern technology, had become completely indispensable. In contrast to earlier societies, moreover, the modern societies have placed a high moral value on rationality, effectiveness, and efficiency. Consequently, the modern society and its instrumental organizations have featured scientific procedures, standardization, objective recruitment, impersonality, automation, exquisite division of labor, hierarchy of authority, and status. These are the

today requires a prior investment of something like $20,000. The bulk of tomorrow's employment will be in the service trades--in health care, teaching, government, management, research, and the like--where the greater the skill or knowledge demanded by a job, the greater will be the capital investment needed to make it possible. See Peter F. Drucker, "The Surprising Seventies," Harper's Magazine, July, 1971, pp. 36-39, and Gross, "Some Questions for the Presidents," p. 316.

1The bulk of this section is heavily drawn from Bennis, "Organizational Developments and the Fate of Bureaucracy," as it brilliantly summarizes the basic theme of bureaucracy and its much- awaited metamorphosis.

2See Weber, The Theory of Social and Economic Organization, pp. 223-225, 239-241; and Etzioni, Modern Organizations, pp. 50-54. Also, Crozier writes that the cross carried by the modern American male is not his submission to the large organizations; "it is his submission to rationalism itself, the manipulation of himself by himself to which he finds himself condemned if he wants to succeed." See Crozier, "The Lonely Frontier of Reason," p. 200. For Weber, however, the true hope for man lay in his ability to rationalize, calculate, to use his head as well as his hands and heart.

3Presthus, The Organizational Society, p. 10.
essential ingredients of a bureaucracy.

In spite of all the pejorative connotations invoked by the term "bureaucracy," it was originally conceived as a social arrangement which was perfected during the industrial revolution to organize and direct the activities of the firm. It was an ideal weapon to harness the human and mechanical energy which fueled the industrial revolution, and it flourished in a highly competitive, fairly undifferentiated, and stable environment.

1Most contemporary students of organizations would argue that bureaucracy must be viewed as a condition which can be dimensionalized, and which can be found to vary empirically from organization to organization. Hall analyzed the various dimensions of bureaucracy as envisioned by Weber, Litwak, Friedrich, Merton, Udy, Heady, Parsons, and Berger. He attributes the following dimensions of bureaucracy to Weber: (1) hierarchy of authority, (2) division of labor, (3) technically competent participants, (4) procedural devices for work situations, (5) rules governing behavior of members, (6) limited authority of office, (7) differential rewards by office, (8) impersonality of personal contact, (9) administration separate from ownership, (10) emphasis on written communication, and (11) national discipline. These dimensions are not necessarily subscribed to by others. See Richard H. Hall, "Intraorganizational Structural Variation: Application of the Bureaucratic Model," Administrative Science Quarterly, VII (December, 1962), 294-308; and Richard H. Hall, "The Concept of Bureaucracy: An Empirical Assessment," The American Journal of Sociology, LXIX (July, 1903), 33.

2For example, the Oxford Dictionary quotes Carlyle as saying: "The continental nuisance called 'bureaucracy.'" It also defines a bureaucrat as one who endeavors to concentrate power in his bureau. See Bennis, "Organizational Developments and the Fate of Bureaucracy," p. 41. Also, another view of bureaucracy is given in one of Webster's definitions: "A system of administration marked by officialism, red tape and proliferation." See Webster's Seventh New Collegiate Dictionary, 1970, p. 112.

3As Becker and Gordon write, "A complete bureaucracy is optimal when the environment is stable." The stable environment decreases the effect of complexity of interaction, and specifies the predictable responses of the organization. However, since
The pyramidal structure of a bureaucracy, where power is concentrated at the top--by one person or a group which has the knowledge and resources to control the entire enterprise--seemed perfect to run the large-scale industrial or commercial organizations such as the railroads. Indeed, the bureaucracy has proved to be an effective and suitable social arrangement for the routinized tasks involved in operating large organizations.\(^1\) The chief merit of the bureaucracy lies in its rationality and technical efficiency, with a premium placed on precision, speed, expert control, continuity, discretion, and optimal return on input. However, these elements also involve one of its major negative characteristics: impersonality.\(^2\)

The bureaucratic structure attempts the complete elimination of personalized relationships and nonrational considerations, such as hostility, anxiety, affectual involvement, etc. Its development was conceptualized as a "reaction against the personal subjugation, nepotism, cruelty, emotional vicissitudes and subjective judgments which passed for managerial practices in the early days of the industrial revolution."\(^3\) The impersonality

\(^{1}\text{Bennis, "Organizational Developments and the Fate of Bureaucracy," pp. 49-50.}\)


\(^{3}\text{Bennis, "Organizational Development and the Fate of}\)
that made bureaucracy technically superior and literally inevitable for the functioning of modern organizational society is also the basic bureaucratic dilemma. Although impersonality delivers to bureaucracy its ultimate efficiency, it also constitutes its most fatal weakness.

The paradox here is that, as the official nature of bureaucracy develops more perfectly, the more completely it is dehumanized and the more completely it succeeds in suppressing from its functions love, hatred, and all purely personal, material, and emotional elements which escape bureaucratic calculation. Consequentially, the bureaucratic mechanism has often been used in the service of repression. Its "iron law" treats man's ego and social

Bureaucracy," p. 43. For Weber, the basic theme of bureaucracy was woven around its impersonality. He believed that roles, institutionalized and reinforced by legal tradition, rather than personalities, should conduct the processes of administration. It should exclusively rely on reason and law. Weber once compared the bureaucracy to "a vending machine into which the pleadings are inserted together with the fee and which then disgorges the judgment together with its reasons mechanically derived from the code." See R. Bendix, Max Weber: An Intellectual Portrait (New York: Doubleday & Co., Inc., 1960), p. 421.

1 Though organizations are not a modern invention, their preponderance as well as dominance in modern society is. They fulfill a greater variety of societal and personal needs, involving a greater proportion of citizens and affecting a larger segment of their lives. Their domination of modern life has forced some writers, such as Presthus, to characterize modern society as an organization society. As Etzioni points out, from the cradle to the grave we are inevitably tied to organizations. See Presthus, The Organizational Society, ch. 1; Etzioni, Modern Organizations, ch. 1; and Boulding, The Organizational Revolution, Part 1.

needs as constant, nonexistent, or inert. In short, the elements of the integrative system, such as love, dignity, respect, identity, and their counterparts, hate, contempt, alienation, etc., are ignored by the bureaucratic machinery. Nonetheless, they insinuate themselves into the social processes of organizations in strange and unintended ways.

These powerful elements must be reckoned with, but that is precisely where the bureaucratic mechanism fails. The routine and oppressive aspects of bureaucracy create a vicious circle which develops from the resistance of the human factor to the mechanistic rationalist theory of behavior imposed on it. This very resistance, paradoxically, tends to reinforce the use of the theory. In a vicious-circle syndrome, the dysfunctional consequences of bureaucratic methods of control lead to a still stronger reliance on such methods. The breakdown of rules automatically begets more rules to take care of the breakdown.¹ This also is an indication that the bureaucratic system is restricted in its possible rate of development, and that the evolution toward efficient, large bureaucratic organizations is not so unrelenting as Weber thought. Rather, such evolution depends to a large extent

on the ability of men to break out of the bureaucratic vicious-circle.  

In addition to the task of realizing the structured goals, such as profit, production, and efficiency, the bureaucratic organizations must undertake two major tasks if they are to survive in the post-industrial society: (1) they must maintain the internal system and coordinate the human side—the task of reciprocity; and (2) they must adapt to and shape the external environment—the task of adaptability. Some writers argue that given its structural determinants, methods, and social processes, the bureaucracy would prove incapable of coping with its internal environment (the task of reciprocity), as well as with its external environment (the task of adaptability).  

Internally, it is incapable of resolving tensions between the individual and organizational goals. Externally, due to the modern technological revolution, the texture of the external environment now contains causal mechanisms so rapidly changing and unpredictable that it poses an insuperable problem for the bureaucracy, which thrives only where the environment is stable and, above all, predictable.

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2Bennis, "Organizational Developments and the Fate of Bureaucracy," pp. 41-50.

3Ibid. This is the basic theme of the Bennis paper. On the question of reciprocity, which would resolve the tension between individual and organizational goals, Argyris also argues that hierarchy, specialization, and other features of bureaucracy are basically incongruous with the needs of a mature personality. Inherent in a hierarchy is a system where the part on the top can direct and control the part on the bottom, which implies the vesting of formal powers at the top to hire, discharge, reward,
Given the post-industrial environment—the task structure, population characteristics, and the features of environmental turbulence—the bureaucracy will have to be replaced by a social structure with more or less the following characteristics.

First, the key word will be temporary: organizations will become adaptive, rapidly changing temporary systems. Second, they will be organized around problems-to-be-solved. Third, these problems will be solved by relative groups of strangers who represent a diverse set of professional skills. Fourth, given the requirements of coordinating the various projects, articulating points or "linking pin" personnel will be necessary who can speak the diverse languages of research and who can relay and mediate between various project groups. Fifth, the groups will be conducted on organic rather than on mechanical lines; they will emerge and adapt to the problems, and leadership and influence will fall to those who

and penalize. The impact of such a structure makes individuals dependent upon, passive toward, and subordinate to, the leader. As a result, individuals have little control over their working environment. Their time perspective is shortened because they do not control the information necessary to predict their future. Such individuals, Argyris sadly concludes, exemplify the dimensions of immaturity, not adulthood. See Chris Argyris, Personality and Organization (New York: Harper & Brothers, 1957), pp. 60-61. In a similar vein, Crozier writes that a vast amount of human resource is wasted because of the bureaucratic inability to organize a social system that would allow people to mature and participate. The basic problem lies in integrating the technical requirements of the bureaucracy and human wants. He warns that so long as management principles are tied in with traditional bureaucratic practices, modern management will not be able to integrate different kinds of rationality and abandon the narrow kinds of synthesis that had previously been necessary to insure precise processes and performance measurement. See Crozier, "A New Rationale for American Business," Daedalus, pp. 154-155. A few resolutions and strategies which deal with the bureaucratic dilemma are proposed by scholars, such as Barnard, Simon, Levinson, Mayo, Likert, Argyris, Blake and Mouton, Shephard, McGregor, Leavitt, and Thompson and Tudens. For discussion, see Benne, "Organizational Developments and the Fate of Bureaucracy," pp. 45-50; and Edmund P. Learned and Audrey T. Sproat, Organization Theory and Policy: Notes for Analysis (Homewood, Ill.: Richard D. Irwin, 1960).
seem most able to solve the problems rather than to programmed role expectations. People will be differentiated ... according to skills and training.

Adaptive, temporary systems of diverse specialists solving problems, coordinated organically via articulating points will gradually replace the theory and practice of bureaucracy... It might be called an organic-adaptive structure.¹,²

¹Bennis, "Organizational Developments and the Fate of Bureaucracy," p. 52. Bennis also provides a footnote referring to M. B. Miles, "On Temporary Systems," in Innovation in Education, ed. by M. B. Miles (New York: Bureau of Publications, Teachers College, Columbia University, 1944), pp. 437-490. Five years later when Bennis returned to the basic theme of this paper, he remarked retrospectively that he was basically analyzing the shift of cultural values and organizational philosophies in this paper. As far as cultural values can be specified, these shifts were from achievement toward self-actualization, from self-control toward self-expression, from independence toward interdependence, from endurance of stress toward capacity for joy, from full employment toward full lives, and from mechanistic forms to organic forms. Concerning the organizational philosophies, the shifts were from competitive relations toward collaborative relations, and from separate objectives toward linked objectives. Referring to the term used by Trist, Bennis suggests that these shifts are essentially toward the post-bureaucratic world. See Warren G. Bennis, "A Funny Thing Happened on the Way to the Future," Indian Administrative & Management Review, II (October-December, 1970), 20; and Eric Trist, The Relation of Welfare and Development in the Transition to Post-Industrialism (Los Angeles: Western Management Science Institute, University of California at Los Angeles, 1968).

²Bennis elsewhere notes that most of these trends are already visible and have been surfacing in the aerospace, construction, drug, and consulting industries as well as in professional and research and development organizations. This indicates that the older models, patterned on pyramidal structures, may no longer be applicable, and that in the coming decades the traditional bureaucratic form will have given way to organizational modes more adaptive to the needs for initiative, free time, joint consultation, and the like. The future organization will have to require fewer restrictions and repressive techniques because of the legitimization of play and fantasy, accelerated through the rise of science and intellectual achievement. See Warren G. Bennis, "Post-Bureaucratic Leadership," in The Future Society, ed. by Donald N. Michael, Trans-Action Books (n.p., Aldine Publishing Company, 1970), pp. 33-55. Also, see Bell, "The Adequacy of Our Concepts," p. 150; and David Riesman, "Leisure and Work in Post-Industrial Society," pp. 71-91. However, it should be noted that the basic challenge for future organizations is how to organize
H. From Public vs. Private to Mixed Entities

Conventional economic analysis has always contrasted the private profit-seeking enterprises with the nonprofit public entities. However, the role of the state as owner and regulator in the economies of Western Europe and, increasingly, in the United States, has permeated so thoroughly that what is public and what is private, and what is for profit and what is not for profit, are no longer easily distinguished.

Particularly in the area of aerospace, atomic energy, and military procurement, the line that now divides the public from so-called private organizations is "so indistinct as to be nearly imperceptible." In name, these companies constitute private enterprise, but nearly all of their output is purchased by the federal government, and all profits above a negotiated sum are returned to the government. Rather than private, these firms the work so that man can live humanely on as well as off the job. In this respect, the task of the organization of work will be particularly difficult in the future because for the first time since creation, man will be faced with his permanent problem, "how to use his freedom from pressing economic cares, how to occupy the leisure which science and compound interest will have won for him, to live wisely and agreeably and well." See John Maynard Keynes, "Economic Possibilities for Our Grandchildren," in Readings in Economics, ed. by Paul A. Samuelson (New York: McGraw-Hill Book Company, 1970), p. 402.

1This section was developed with assistance from Mason, "Introduction." Many references that follow were first found there, and then traced to their original sources for further research.


represent the seminationalized branch of the economy. The government, rather than the competitive market, determines their profitability and even their survival.¹

On the other side of the fence, there are so-called non-profit public enterprises, such as the New York Port Authority, which obtain their funds by selling bonds to private investment institutions. They make enormous profits which do not go to the stockholders, but which are reinvested in new enterprises far beyond the original charter of these corporations. Similarly, mutual insurance companies and mutual savings banks are nonprofit, yet their rates, salaries, and practices are virtually identical with the capital stock insurance companies and savings banks.²

In the forms of organization, techniques of management, and motivations and attitudes of managers, there is a great deal

¹Murray L. Weidenbaum, as reported in ibid., pp. 399-400. During much of the late sixties Boeing and General Dynamics sold 65 per cent of their output to the government. Raytheon sold 70 per cent, Lockheed sold 81 per cent, and Republic Aviation sold 100 per cent. What is more, executives move easily across the line. On retirement, the admirals and generals, as well as high civil servants, go more or less automatically to the more closely associated industries. Ibid. For an account of how such highly placed officials as Bryce Harlow, Clarence D. Palmhy, Carl E. Bagge, James Ferguson, Nicholas Katzenback, and James Needham move between business and government, see Michael C. Jensen, "Musical Chairs in Business and Government," New York Times, November 12, 1972, sec. 3, p. 1.

of similarity between public and private enterprises. This is more a function of the administrative imperatives of a large organization rather than of ideology, which is usually invoked when a distinction between public and private enterprises is made. Basically, a large organization "facing fundamental similar problems, acts in fundamentally the same way, whether publicly or privately owned."^1

As a result of the remarkable flexibility of the American administrative system, governments at various levels have sought increasingly to use the private corporation for the performance of what are essentially public functions.^2 Private business organizations still enjoy an immunity from detailed government supervision, while a public organization suffers from archaic civil service rules and rigid bureaucratic immobility. Private corporations, in turn, particularly the giant multinational ones, in


^2According to Bell, this also comes from the distinctive role of government as the "funder," but not the operator, of activities. As a specific instance, he cites the emergence, in the ten years after World War II, of the nonprofit systems, research and development corporations. The creation of Rand Corporation, housed originally at Douglas Aircraft Corporation as a "think factory" for the Air Force, provided a model which was quickly used by the Defense Department and other government agencies to create what is essentially a new form. In some cases, these new groupings are independent corporations; in others, they are housed in universities or are managed by a consortium of universities. There are nearly 500 such nonprofit defense contractors whose annual billing in the fiscal year 1967 amounted to more than one-half billion dollars. See Bell, "The Adequacy of Our Concepts," p. 148; and Ridgeway, The Closed Corporation, pp. 199-210.
affect and mold public policy both at home and abroad.\textsuperscript{1} Thus,

If the question [of public versus private] is seen in realistic terms, we shall have to devise some way of calculating whether a particular function can be performed best in the public interest as a completely government operation at the one extreme, or a completely private operation at the other extreme, or by some mixture of the nearly infinite possibilities of elements of ownership regulation and management that our variety of precedent suggests. . . .\textsuperscript{2}

In the above perspective, the folklore of capitalism concerning the socialism-versus-free enterprise debate seems to have lost most of its steam. Insofar as corporate capitalism is concerned, private ownership is simply a legal fiction. It is a tendency of big enterprise to socialize itself; a point is reached in the growth of such entities when "the stockholders are almost entirely dissociated from the management, with the result that the direct personal interest of the latter in the making of great profit becomes quite secondary."\textsuperscript{3}

\begin{itemize}
\item \textsuperscript{1}For instance, in testimony before the Senate Foreign Relations Subcommittee, the executives of International Telephone and Telegraph Corporation admitted that in 1970 they tried to enlist the Central Intelligence Agency and other government agencies in schemes to prevent the election of Marxist Salvador Allende as Chile's president, and to disrupt the country's economy. The admission of this case created a scandal, particularly when many companies are urging the government to do more to help them meet rising international competition. See "Foreign Commentary: The Questions the ITT Case Raises," \textit{Business Week}, March 31, 1973, p. 42. See also Mason, "Introduction," pp. 15-19.


\end{itemize}
In earlier eras, property ownership was conceived in a larger individual and social matrix. By the nineteenth century, the capitalist owner was "full-blooded" and ready to fight for his property against any encroachment. In the era of corporate ownership, however, the present stock-and-bond owner has only the vaguest idea about where his property is or of what it consists. He is rarely an owner like the property owner of earlier days, who was involved directly and psychologically in the fate of an enterprise.1

This kind of ownership description better fits the employees of the corporation. The stockholders, in contrast, are mostly in-and-out, with little continuing interest in the enterprise. Their in-and-out procedure does indeed provide a disciplinary force that may prod the corporate management to perform more effectively, but this is more in the form of a countervailing power than ownership. On the other hand, in a society of

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1As Schumpeter remarks, it is indeed ironic that the capitalist process pushes into the background all those institutions that express the needs and ways of truly private economic activity. Furthermore, by substituting a mere parcel of shares for the walls and machines of a factory, the capitalist process takes the life out of the idea of property. This leads to the evaporation of the material substance of property—its visible and touchable reality. Dematerialized, defunctionalized and absentee ownership, Schumpeter concludes, does not impress and call forth moral allegiance as the vital form of property once did. See Schumpeter, Capitalism, Socialism and Democracy, pp. 139-142. Similarly, Mason concludes that the eighteenth century economic justifications of private property based on the assumption that ownership carries with it control lack relevance in a corporate universe. It is difficult to see in the ownership of corporate securities the source of that invigorating moral, social, and political development that Jefferson saw in private property. See Mason, "Introduction," pp. 14-15.
wage and salaried employees, the corporation provides a social institution for its employees to inhabit. If we conceive of stockholders not as owners but merely as legitimate claimants to some fixed share of the profits of a corporation, then it is certainly not a private property institution, and the concept of stockholders as owners of the corporation is reduced to a mere legal fiction.¹

In the Marxian as well as the neoclassical economic schemes, capitalism was generally considered an economic system in which the means of production were privately owned and the mechanism of the market regulated the main currents of economic activity. These schemes also implied that the economic machinery in a capitalist economy has a dominant superstructure apart from the rest of the societal structure. Since World War II, however, 

¹Bell, "The Corporation and Society in 1970's," pp. 28-29. There is an enormous amount of literature available both favoring and opposing this theme, varying from the classic Berle-Dodd debate in the Harvard Law Review, to the writings of Thurman Arnold from the thirties until the present. Opponents of this view, like Friedman, see the corporation as fundamentally an artificial person, and the corporate manager as simply an agent of the individual shareholders. The underlying reason for their view is that a stockholder as an owner has put up the equity capital and taken a risk. Davenport suggests that the heart of the matter is the question of the nature of the corporation: Is the corporation primarily an instrument of owners—legally the stockholders—or is it an autonomous enterprise which, despite its particular history, has become—or should become—an instrument for service to society in a system of pluralist power? See Adolph A. Berle, Jr., "Corporate Powers as Powers in Trust," Harvard Law Review, XLIV (May, 1931), 1049-1076; E. Merric Dodd, Jr., "For Whom Are Corporate Managers Trustees?" Harvard Law Review, XLV (May, 1932), 1145-1164; Thurman Arnold, The Myth & Folklore of Capitalism (New Haven: Yale University Press, 1937); Milton Friedman, Capitalism and Freedom; and John Davenport, "Bank of America Is Not for Burning," Fortune, January, 1971, pp. 91-93, 152.
the range and depth of government penetration into the economic process have undergone a radical and decisive increase. Particularly in the United States, military, space, and other governmental expenditures have been greatly enlarged. Activities of the federal, state, and local governments in providing community services have expanded in the unprecedented growth of health, education, and welfare functions. This has created a political superstructure which now dominates the economy and exercises a control over the entire economic spectrum that was not anticipated.¹

The so-called nonprofit public sector now accounts for about one-fourth of the gross national product. During the fifties, one out of every ten new jobs added to the economy was generated in the public sector. During the sixties, not less than one-third and possibly almost two-fifths of all employment was accounted for by the activities of this sector.² The economy that accommodates such an overwhelming public sector can better be described and analyzed as, to say the least, a mixed economy.


XII. CONCLUSION

A. A National Society

A model of the national society provides a framework for the nation and its subunits to orient their internal and external relationships. More particularly,

a national society, taken in its full concreteness, involves a human population inhabiting a bio-physical environment, using numerous artifacts that are produced, maintained, and used by means of knowledges and skills. The society's members relate themselves to members of other societies, and some relations are representative for the entire society as a collective unit. At any point in time, the society's members carry a describable culture, including language, concepts, science, law, beliefs, values, goals, symbols, and numerous norms providing definition of behavior, thoughts and feelings.¹

Increasingly apart from the local and regional differences which once fragmented it, the American nation has emerged into one society in the fundamental sense that the changes taking place in one section of the society have immediate and repercussive effects in all the others. In this respect, it has become a genuinely national society.²

1 Robin M. Williams, Jr., "A Model of Society--The American Case," in A Great Society? ed. by Gross, p. 40. Williams further states that the major normative structures in all societies are the institutions which interconnect "subsystems of important obligatory norms guiding conduct in sets of status roles that cohere around major foci of interests." For Williams, the major institutions of society include the following: (1) kinship and family, (2) social stratification, (3) economy, (4) polity, (5) education, (6) religion, and (7) recreation. Ibid., pp. 40-41.

² For example, in the midst of the severe economic depression of 1893, a group of unemployed, the so-called "Coxey's Army," began a march on Washington from Massillon, Ohio. Ten thousand
The enormous problems of education, transportation, welfare, urban renewal, air and water pollution, medical care, and the like are now viewed as national in scope, and are passed on to the national society for solution. The main thrust of this development is to create an integrated mass society where we have: (1) an intertwined national economy, in which both public and private sectors cooperate with each other for the total societal benefit; (2) a national polity, in which the government has become an active force for social change; (3) a welfare society, in which medical care, education, and income maintenance for the disadvantaged have become a responsibility of the federal government; and (4) a national culture, which

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*Williams views this as a shift in the direction of what he calls an integrated mass society. For him, the dominant trends are toward affluence, consensus, centralization, advanced technology, high level of formal education; equalization of rights, privileges, and substantive conditions of regions, races, ethnic groupings, and religious groupings; security and enjoyment values; low tension; and increased expressiveness. Supporting these trends are the main movements from particularism to universalism, from ascription to achievement, from affectivity to affective neutrality, from diffuseness to specificity, and from self-interest to collective interest. See Robin M. Williams, Jr., "Social Change and Social Conflict: Base Relations in the United States, 1944-1904," Sociological Inquiry, XXXV (Winter, 1905), 8-25; and Williams, "A Model of Society--The American Case," pp. 40-50.
diffuses popular art through the mass media.\textsuperscript{1}

The increased objective interdependence on a national scale, particularly in economic, technological, and political activities, and decreased local isolation and autonomy have accelerated trends toward national centralization and uniformity which are evident in the federal government, in the education system, and in virtually every other sector of the society. The emergence of a variety of activities that are carried on at a national scale, including a federal administrative structure of unprecedented dimensions, closes the full circle of the American national social system.\textsuperscript{2}

Given the coordinative needs of a national society, a national state will have to provide an effective centralized government that claims a final monopoly of political authority in the legitimate use of coercion and organized physical violence. However, such a governmental structure is centralized effectively only in the area of policy formulation and funding. The operative functions should be in the hands of regional or metropolitan, profit-oriented or nonprofit, organizations whose size, scope, and competence would be appropriate to the functions that need to be performed.\textsuperscript{3}

\textsuperscript{1}Bell, "The Adequacy of Our Concepts," pp. 145-147.


\textsuperscript{3}Ibid.
B. Dilemmas of Collective Decision-making

A social system can be seen as an "energized web of overlapping interactions among social actors, sufficiently stabilized to permit us to discern recurrent relationships and institutional patterns."¹ The basic idea here is that activities of men are mutually intertwined and that any activity in society is not independent of any others; therefore, it should be specified in terms of others. In a tightly interwoven national society, this mutuality of activities is increased multifold.

In a national society, more goods and services would of necessity have to be purchased communally. Services such as the clean-up of pollution, the reorganization of a city, the rationalization of transit, the maintenance of open spaces, and the extension of recreational areas cannot be bought individually. Such projects must be undertaken through the group or communal instruments. One cannot buy his own share of clean air in the market. Communal mechanisms are the only available tools to deal with the problems of pollution and the like.²

If these goods can be bought only on a collective basis, the mechanism of the market which has served us well so far

¹Ibid., p. 34.

²Shonfield, "Business in the Twenty-First Century," pp. 197-200. See also Bell, "The Adequacy of Our Concepts," pp. 128-134. Similarly, Rostow suggests that the post-industrial tasks can be dealt with effectively only in a national and communal way. The individual acting alone cannot do much for himself or for others. An array of increasingly acute problems has emerged which we can only solve at the national level and which require that we make common cause as a national community. See Rostow, "The Next Stage."
collapses immediately. The distinct merit of the market lies in its invisible hand which aggregates the multiple choices of thousands or millions of consumers, who are acting independently in the market. These aggregated decisions are public and real. The invisible hand of the market disperses the responsibility, however, because the processes of decision-making are multiple and private. In the case of the public goods of the national society, decisions will have to be made increasingly through collective planning. Against the impersonal and dispersed role of the market, planning provides a specific locus of decision. Not only the decisions, but also the decision-makers themselves are visible.

In effect, decision-making has already become public, and therefore politicized. The question of whether a road is to go through the ghetto or the rich section of town, the location of a jet airport, a decision to centralize or decentralize schools, the character of a housing project, and thousands more cannot be settled on the basis of technical criteria alone. Such questions are subject to all the multiple, direct pressures of political decision-making. They represent an effort to create social choices out of the discordance of personal individual preferences.

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1 Bell, "Unstable America," pp. 20-21.
3 Ibid. This is particularly important for accounting because now it has reached a stage in its development where the wide issues of public policy can be settled by the establishment
One reason why the market mechanism works so well is that individuals have their own scale of values which allows them to assess their relative satisfaction against cost, and to make their choices accordingly. There is no ordering mechanism in the non-market decision-making process that would rationally combine the discordant individual preferences in a cost-benefit analysis with the varying combinations of private consumption and public purchase of goods.\(^1\) Worse yet, the translation of the will of the people in social policy, which is considered a desirable objective at least in a democracy, is not even a theoretical possibility. The problem of "how best to amalgamate the discordant preference patterns of the members of a society to arrive at a compromise preference pattern for society as a whole" is insoluble.\(^2\)

\(^1\)Bell, "The Adequacy of Our Concepts," pp. 128-134.

\(^2\)Ibid., p. 132.
As Arrow has shown in his "impossibility theorem," no social decision can amalgamate the diverse preferences of a group in the way a single individual can amalgamate his own. The individuals in a group may have a perfectly consistent set of preferences, yet the group preference, as determined by a majority vote, can be inconsistent. For example:

Let A, B, and C be the three alternatives and 1, 2, and 3 the three individuals. Suppose individual 1 prefers A to B and B to C (and therefore A to C), individual 2 prefers B to C and C to A (and therefore B to A), and individual 3 prefers C to A and A to B (and therefore C to B). Then a majority prefer A to B, and a majority prefer B to C. We may therefore say that the community prefers A to B and B to C. If the community is to be regarded as behaving rationally, we are forced to say that A is preferred to C. But in fact a majority of the community prefer C to A.

The rational method of arriving at a social policy does not yield determinate results even at the theoretical level, and thus the idea that there is at least a theoretical social decision which can satisfy all is an illusion. At the practical

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1Kenneth J. Arrow, Social Choice and Individual Values (New York: John Wiley and Sons, 1951), p. 3. This is Arrow's "impossibility theorem" or what has often been called the paradox of voting. Arrow's above-mentioned book contains a more complete discussion of it. However, a somewhat shorter statement by Arrow, followed by papers discussing its major theme by leading economists and philosophers, including Paul Samuelson, Kenneth E. Boulding, Milton Friedman, Sidney S. Alexander, Kurt Baier, Adolph Lowe, and Paul Weiss, can be found in Hook, ed., Human Values and Economic Policy, Pt. I and II. Also, further discussion of this theme can be found in R. Duncan Luce and Howard Raiffa, Games and Decisions (New York: John Wiley & Sons, Inc., 1957), ch. xiv; and James M. Buchanan and Gordon Tullock, The Calculus of Consent, Ann Arbor Paperbacks (Ann Arbor: University of Michigan Press, 1965), Pt. III and Appendix 2.

2To some, this conclusion seems a little unwarranted because they think that the paradox of voting as stated by Arrow
level, in nonmarket politicized public decision-making, what is left is not rationality but rather hard bargaining between different interest groups exercising their relative weights and pressures, which are balanced in the light of some value sense of the national need and the public interest.¹

C. The Necessity of Arbitration and Planning

Whereas individual goods are divisible, and therefore appropriable and saleable, public goods are indivisible. They must be provided collectively, where it is impossible to exclude some from their benefit. Here, of course, what is true of public goods is equally true of public bads.²

¹Bell, "The Adequacy of Our Concepts," pp. 129-134. Similarly, with particular reference to the American political system, Dahl observes that decisions are made by endless bargaining. With all its defects, the bargaining process nonetheless provides a high probability that an active and legitimate group will make itself heard effectively at some stage in the decision-making. See Robert A. Dahl, A Preface to Democratic Theory (Chicago: University of Chicago Press, 1956), p. 150.

The basic issue in a national society where both public goods and bads proliferate is that of control. In a market economy where goods are divisible and appropriable, control is exercised through the so-called exclusion principle. If a customer wishes to satisfy his desire for a particular commodity, he must bid for it and meet the terms of exchange set by those who happen to possess this particular commodity, and vice versa. "That is to say he is excluded from the enjoyment of any particular commodity or service unless he is willing to pay the stipulated price to the owner."¹

In the case of public goods or bads, however, the exclusion principle does not provide an effective tool for social control. "People who do not pay for the services cannot be excluded from the benefits that result; and since they cannot be excluded from the benefits, they will not engage in voluntary payments."² If it pays to be a free loader, everybody will become a free loader. Consequently, public goods will be in a worse condition than they otherwise would have been. Similarly, if third parties cannot be excluded from the benefits of public goods, neither can they escape from the harm of public bads. ³ While private goods and bads

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²Ibid., p. 8.

³Boulding, "Toward a Twenty-First Century Politics," pp. 314-316. Boulding further suggests that there has to be some form of legitimized coercion, such as the government, if public goods are to be provided. Ibid. Furthermore, in many cases, the problem may not have any technical solution, and may require a
can be handled adequately by the market mechanism, public goods can be provided only through budgetary public planning, and public bads can be curbed only through public arbitration.¹

The traditional concept that the equilibrium between costs and returns, between the values of the elements of production and the product, is spontaneously established by the machinery of the market, and that the individual members of society can establish and achieve their goals through the invisible hand of the market, should be reexamined in the light of post-industrial realities. Further, given these realities, functions of planning and arbitration will be of decisive importance.²


¹ See Musgrave, The Theory of Public Finance, pp. 6-12; and Bourricaud, "The Post-Industrial Society and the Paradoxes of Welfare," pp. 50-55. What is worse, the effect of free loading is reinforced by the tendency of public budgets to be too small. Downs has proposed that budgets of democratic governments tend to be kept below the optimum. He gives three explanations for this tendency: (1) The citizens are incompletely informed, especially concerning the advantages which they can obtain as users of the public services. (2) There is some amount of cognitive dissonance in public taxation. On the one hand, the benefits which a citizen may derive from a social service program are remote and uncertain, and on the other hand, the cost which the establishment of such a program entails is immediately and painfully felt, because it brings an increase in taxes and quota changes. (3) The eventual beneficiaries are unorganized individuals who not only are rather incapable of perceiving what their interests really are but who, even if they succeeded in understanding their real interests, would be lacking in the means to prevail. See Downs, "Why the Government Budget Is Too Small in a Democracy," pp. 540-563.

² Bourricaud, "The Post-Industrial Society and the Paradoxes of Welfare," pp. 52-60. Bourricaud maintains that the necessity of planning or forecasting is indicated as a counterweight to the thoughtlessness, or rather the insensitivity, of individuals to their common interest as citizens. As to the necessity for arbitration, he suggests that it is due to the excessive extent to
The orientation of collective action will have to be more in terms of an ex-ante direction of the factors of production and less in terms of ex-post remedies, such as a correction in the distribution of income. The inequalities, such as those in income distribution, once crystallized tend to stick fast and are extremely difficult to eliminate. Therefore, they should be dealt with in a preventive manner. Thus, the core of post-industrial public policy, both in planning and arbitration, will be framed in terms of ex-ante control and direction in order to keep at a minimum both the internal and external costs of growth, and to direct growth activities in such a way that they will create positive internal as well as external effects.

D. The Catholicity of the Accounting Function

Accounting can be considered an information system of a limited kind that transfers certain images of a phenomenon with which the decision-maker is dealing. On a broader scale, it seeks to clarify for the society as a whole a certain dimension of its properties. So far, that dimension has been the economic which those who are organized profit by the abuse of their power. 

\[1\]

For example, the existence of irreducible poverty is well established in most of the industrialized countries. Bourricaud examines the French case. See ibid., p. 53-55. For a somewhat dated analysis of the American case, see Michael Harrington, The Other America, Poverty in the United States (Baltimore: Penguin Books, 1963). Also, see Richard Parker, The Myth of the Middle Class, Notes on the Affluence and Equality (New York: Liveright, 1972).

\[2\]Bourricaud, "The Post-Industrial Society and the
dimension of society as measured in monetary units, that is, accounting as a communication system has tried to provide images of the subject matter to the decision-maker which were framed in the unidimensionality of monetary terms.

In a dynamic view of the societal process, it is envisioned that society is continually seeking an equilibrium with its ever-changing self as well as with its environment. Accounting, as an anticipatory and a feedback information system, seeks to help society achieve that equilibrium. This societal function of adaptation is in the domain of a social subsystem of the economy. It is through the economy that society tries to adapt itself to its larger ecological environment, and in the process also adapts that environment. To a great extent, accounting functions as a tool that furthers the societal processes of adaptation.

The general function of accounting thus can be interpreted as one which dispels the divergence which exists between the reality of a phenomenon and its varied perceptions. This is the function of shattering the illusions which the decision-maker might have about the phenomenon with which he is dealing. Consequently, accounting should be neither more nor less than an equable communication of the images of reality in all their authenticity. Like a good camera, it should depict the subject matter in a picture as truthfully as possible.

The unadulterated transfer of authentic images by accounting does not, however, entirely insure us against the distortion

of reality. The last vestiges of an illusion that distorts reality are within our native perception. There is bound to be some ineluctable and irreducible difference in the way in which people perceive a subject, regardless of how carefully and truthfully it is communicated, because human beings simply do not perceive things identically. Nevertheless, the basic accounting function of communication still holds. The better we know the reality that surrounds us, the better equipped we are. Whether we know it all or nothing at all, our contact with that reality is inevitable.

E. The Contour Lines of the Post-Industrial Accounting Function

The basic thrust of post-industrialism is to end social fatalism. We no longer mutely accept the events of nature and society as "givens"; the future will no longer simply arrive but will be made with deliberately chosen goals. In such a societal framework, the communication function of accounting, both as a retrospective feedback system and as an anticipatory guiding system, should attempt to help us prepare for the relevant elements of futurity. It is this post-industrial imperative which requires that the accounting profession, particularly in its adherence to generally accepted accounting practices, should come to terms with the changed realities of the post-industrial world. The industrial world may well be the last of the societal environments to tolerate the unidimensionality of the accounting report, which is the kernel

1Adolph Lowe, "Is Present Day Higher Education 'Relevant'?
Social Research, XXXVIII (Fall, 1971), 33-50.
of the accounting function.

The industrial society in the West was marked by three distinctive features: the growth of the corporation, the imprint of the machine and its rhythms on the character of work, and the labor conflict.\(^1\) The predominance of these features in the industrial society was to a great extent a measure of the latter's preoccupation with the theme of economic growth. These factors are the direct derivatives of a growth economy. It should be noted that in each case the stakes were private or organizational; they could be, and indeed were, reconciled on economic terms. This is why the mechanisms of the market have performed so well in the functioning of industrial economies. The societal accent on economic growth in an industrial economy preempts the focus, while noneconomic considerations, no matter how relevant, are condemned to oblivion.

With the emergence of a post-industrial order, however, the distinctive industrial features are changing. Above all, the affluence of a post-industrial order brings noneconomic considerations and their resilient multidimensionality to the center stage. Further, the conflicting interests of a post-industrial society are no longer private or organizational. Rather, they are collective and communal, and difficult to be reconciled on a monetary scale. The multidimensionality of a post-industrial conflict is not only pronounced but also something which cannot be ignored in the pluralistic democratic societies.

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\(^1\) See footnote 1 on page 63 above.
It is in the multidimensionality of the post-industrial environment that accounting faces its first historic crisis. If accounting continues to march along the primrose path of its traditionally revered dogma of unidimensionality, it will surely fall short of its catholic communication function. In such a failure it would lose its impact on human action, and, ultimately, its public purpose. In accounting "it is useless merely to observe what accountants do; it is necessary to show that the results of what they do have a clear connection with the kinds of action people take and with the attainment of the ends they pursue."^1

It is the public reliance on accounting communication which gives this field its legitimacy as a public profession. As such, accounting has been effective, which was one of the bounties of the growth-oriented industrial economy. But that era is passing, and the creeping multidimensionality of a post-industrial economy from which there is no escape is upon it.

Even in a post-industrial order the basic accounting function of measurement and communication has not changed. What has changed, and changed radically, however, is the content of that function. The new content—the information to be measured and communicated—is no longer responsive to the traditional accounting tools of measurement and communication. In fact, this is the heart of the accounting crisis.

For five centuries since Paciolo, the accounting function has been performed with varying tools and notions. It is only in this century, however, that the society at large has taken wider notice of the public purpose of accounting. In the past decade and a half, accountants have witnessed a great number of controversies concerning the nature of the accounting function and how it ought to be performed. These controversies reveal the growing pains of a profession which is struggling to meet the challenges of a world quite different from the one in which it was originated.

With the post-industrial erosion of the market, performance of the accounting function necessitates that it, above all, be cybernetic. The feedback system of reward and punishment which has performed so well through the invisible hand of the market will now have to be specifically contrived to assure efficiency in communal actions.

In the industrial society, where exchange relationships predominate, the market forces unobtrusively guide human behavior by specifying rewards and punishment through the terms of trade. This system of market sanctions works well in industrial societies because nearly all dominant issues are generally seen and resolved in terms of exchange relationships, and therefore are functionally reducible to monetary calculations. In the post-industrial society, however, with the emergence of collective choice and action, the effectiveness of market sanctions is lost. Guidance of human behavior becomes a deliberate and conscious process, as exemplified in planning and arbitration.

The post-industrial emergence of planning and arbitration
requires that the accounting framework must help the decisional authorities assess (1) the public goods and bads on a multidimensional scale, and (2) the divergence between private and public costs. In spite of technical and other difficulties involved in its development, such a social cost-benefit matrix is precisely what is needed to effectively perform the post-industrial accounting function.¹

The directions in which steps should be taken to develop a social cost-benefit matrix are the following:

(1) more complete coverage of variables; (2) greater exactness in the indicators used; (3) greater capability of quantitative expression; (4) improved analysis of the complex interaction effects among the elements making up the model; (5) greater sophistication in qualitative mapping of unmeasured factors and variables; (6) greater sophistication in allowing for possible effects of unmeasured factors; (7) improvement in the procedures and technology of computer simulation.²

A social cost-benefit matrix system using the above criteria should be set up to provide social indicators that will

¹Bell, "The Corporation and Society in the 1970's," pp. 15-17. Bell further notes that currently the accounting system evaluates publicly-provided services such as health, education, or protection only by the "input" costs. Thus, the "output" of police services is measured by salaries paid to the members of the police department, the cost of police cars, etc., and not by the social and economic value of crimes prevented or violators apprehended. Regarding the divergence between private and social costs, Bell suggests that in the next decade one of the major social questions will be the determination of who is to pay the costs of such externalities, and how the amounts will be assessed. Further, which costs ought to be borne by the parties that generate the costs, and which, legitimately, should be borne by the society as a whole—this will be one of the most difficult questions in the political economy of the future. Ibid.

²Williams, "A Model of Society--The American Case," p. 46.
give us a broader and more balanced perspective of the meaning of economic growth. Such a system would move us toward measurement and communication of the utilization of societal resources in the following four areas:

(1) the measurement of social costs and net returns of innovation; (2) the measurement of social ills (e.g., crime, family disruption); (3) the creation of "performance budgets" in areas of defined social needs (e.g., housing, education); and (4) indicators of economic opportunity and social mobility.¹

F. The Post-Industrial Formulation of Accounting Principles

The process of planning and arbitration provides a focus for the centers of decision-making. In earlier societies where market forces largely predominated, decision-making was individual and private. The decision-maker could hide behind his anonymity, and his decisions became a market force only when they were aggregated with those of large numbers of others. In this process of aggregation, however, the focus on individual decision-making was lost. Its force, though very real, was essentially invisible, and this invisibility provided a shield behind which market mechanisms were functioning.

In a post-industrial society, the process of planning and arbitration identifies the centers of decision-making. Their very visibility makes them vulnerable to pressures from groups whose vital interests are at stake and under consideration. In a pluralistic democratic society, the planning and arbitration

process becomes open and public, and therefore political. This is the most important implication of the post-industrial environment. The political orientation of even the most complex of problems necessitates that mere technical considerations, no matter how objective, are not enough to provide the legitimacy needed for implementing decisions. This is the lesson, though hardly heeded, of the controversy that ensued each time the Accounting Principles Board touched the area of investment tax-credit.

To say that rule-making in accounting is a political process is not to minimize the complex technical aspects of the whole galaxy of problems facing the profession. On the contrary, as already shown in a variety of the Opinions of the Accounting Principles Board, complex technicalities have been a preoccupation with the Board as well as with the profession which has had to come to grips with the Board's Opinions. Moreover, as the complexity of the post-industrial environment continues to increase, the required accounting practices and pronouncements will inevitably grow more arcane and complicated. However, the rule-making process in accounting at its heart will continue to be political where technical considerations are not the only ones that provide all the answers.

The political orientation of rule-making in the accounting profession would insure that all groups whose legitimate interests are at stake would be appropriately represented in the
decision-making process. The purpose of such representation is not to provide a decisional equivalent of the lowest common denominator. Rather, it is to meet what Weber has called the "ethics of responsibility." Those who take on the responsibility of reordering the surrounding environment or of drawing a blueprint of the new society or its various parts will have to reject the absolutes and accept pragmatic compromises. They cannot afford to seek ultimate ends. On the contrary, it is their burden to adapt to all sorts of people and situations--"a game in which one may score but only by accepting one's

1This much has been conceded by the American Institute of Certified Public Accountants. Marshall Armstrong, the first chairman of the Financial Accounting Standards Board, recently insisted: "When we think about issues, there must be public thinking about issues. Without public involvement, the FASB will not be successful," See "The Accountants' Last Chance," Business Week, March 31, 1973, p. 91. It was also decided that not only will the Board hold public hearings on the Standards that it is considering, but it will also see that drafts of proposed accounting rule changes are circulated for public comment before the final vote. The Board is comprised of seven members of whom only four should be drawn from the public accounting practice. The Institute is determined to include a broad-based representation not only in the Board but also in the Financial Accounting Foundation which appoints the members to the FASB, and in the Financial Accounting Standards Advisory Council which will work closely with the Board in an advisory capacity. See "Recommendations of the Study on Establishment of Accounting Principles," The Journal of Accountancy, CXXXIII (May, 1972), 60-71. It is interesting to note that in regard to the Accounting Principles Board, it was decided that the "Big Eight" public accounting firms must be given representation through their powerful managing partners. The membership of the initial Accounting Principles Board was composed of twelve practicing accountants, three university professors, two financial executives, and one AICPA Director of Research. See Zeff, Forging Accounting Principles in Five Countries, pp. 172-173.

opponents, rather than a moral crusade in which one's stainless standard must mow the enemy down."¹

One immediate impact of the politicization of the accounting rule-making process is to force the organized accounting profession into the thicket of national and, with the emergence of multinational corporations, into international politics. So far, accounting has enjoyed a relatively rich political anonymity. In the largely open and public decision-making process of the post-industrial society, however, the accountant will have to shed his anonymity and be answerable for his actions.

The visibility of the accounting function is already evident. Recently, the profession was involved in the larger issues of public policy to the extent that it formulated and proclaimed policy rules on its own in the process of establishing certain reporting principles and conventions. The case in point here is the APB Opinion on mergers which, as some believe, has curtailed the rush of conglomerates much more effectively than could have been accomplished by the attorneys of the Department of Justice.² This involvement on the part of accounting in the matters of public affairs occurred by default because those in charge of the policy formulation either had sought to ignore such policy matters or, worse yet, were unaware of the impact that

¹Edmund Wilson, as quoted in Bell, The End of Ideology, p. 302.

²For example, see Frese and Mautz, "Financial Reporting--By Whom?" pp. 3-4.
accountants could exercise on national trends. ¹

In the post-industrial society, the accounting function will be construed as one of the powerful instruments in the public armory to be used to achieve the larger objectives of public policy. To be such an effective instrument, the accounting profession and its rule-making body need the leverage of a vested authority. Only such an authority can pronounce rules and regulations which will prevail. Accounting as a profession would have to come to a collective realization that, without such leverage, at least in the public arena, any rule-making body is nothing but a sham. On substantive issues a regular display and an occasional exercise of political muscle are the only sure ways to obtain the desired adherence to rules.

In spite of all due deliberations, and representative consultation and participation that will go into the making of the various pronouncements of the Financial Accounting Standards Board, it will encounter the same problems as its ill-fated and much-abused predecessor. As soon as its pronouncements erode

¹One outstanding example of how accounting practices affect the fate of vital national industries is the case of railroads. Since 1914, the railroad industry has been practicing so-called Betterment Accounting, under which it never depreciates its tracks. Thus, the tracks are still carried on the books at their historical costs long after they have lost all their economic utility. Further, to improve the income situation fictitiously and make the books look better, Betterment Accounting discourages railroads from incurring any normal expenditures pertaining to repairs, renewals, and replacements. Thus, modern technology has revolutionized everything in transportation but the railroad, which is still a dismal captive of its accounting practices. See "How Railroad Accounting Eats Up the Assets," Business Week, September 8, 1973, pp. 50-57.
the vested interests, the latter will put up stiff resistance. It is in this context that rule-making in accounting is essentially a political as well as an institutional process rather than a theoretical, technical, or research issue, as some have asserted.¹

Figure 7 gives a bird's eye view of the major theme of this inquiry. An attempt has been made here to integrate the institutional phenomenon of modern technology and its impact on social as well as economic organizations. It is in the perspective of this integration that future accounting functions should be conceived, or that the catholicity of the accounting function should be rediscovered. It is only in this way that accounting can escape the blind alley of unidimensionality in which it has found itself. Even in the post-industrial age, the motto that should guide accounting is as old as Bacon, who admired the inventor and experimenter. Nearly four centuries ago, he wrote:

Again there is another great and powerful cause why sciences have made but little progress, which is this.

¹For example, in 1957, Alvin R. Jennings, then the incoming AICPA president, proposed the creation of a research foundation which would "carry on continuous examination and re-examination of basic accounting assumptions and . . . develop authoritative statements for the guidance of both industry and our profession." He further added that the "development of accounting principles should be regarded as in the nature of pure research." See Alvin R. Jennings, "Present-Day Challenges in Financial Reporting," The Journal of Accountancy, CV (January, 1958), 32-34; and George O. May, "Generally Accepted Accounting Principles," The Journal of Accountancy, CV (January, 1958), 23-27.
FIGURE 7
THE POST-INDUSTRIAL ACCOUNTING ENVIRONMENT

INSTITUTIONAL PHENOMENON
OF
TECHNOLOGY

ACCOUNTING FUNCTION
AND
DISCIPLINE

IMPACT ON ECONOMY
AND
ECONOMIC
ORGANIZATIONS

IMPACT ON
SOCIAL SYSTEM
IN GENERAL
It is not possible to run a course aright when the goal itself has not been rightly placed. Now the true and lawful goal of the sciences is none other than this: that human life be endowed with new discoveries and powers.¹

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VITA

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