THE HUMANIZATION OF THE SOCIAL SCIENCES

K. William Kapp

Edited by

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PREFACE

Shortly after Professor K. William Kapp's death in April 1976, Professor Roy Preiswerk of the University of Geneva assembled a set of papers by Professor Kapp on trends and difficulties in the contemporary development of the social sciences. The collection was designed to complement another volume of Professor Kapp's papers on social costs and industrial and environmental problems.* Upon Professor Preiswerk's most untimely death in 1982, it became my task to complete the job, with added introductory matter where indicated. It is an honor for me to present the work of my late friends and colleagues in this form.

Hempstead, New York
September 1984

John E. Ullmann

*K. William Kapp, Social Costs, Economic Development and Environmental Disruption, J. E. Ullmann (ed.), (Lanham, MD: University Press of America, 1983).

INTRODUCTION

Roy Preiswerk and John E. Ullmann

The present collection of papers addresses itself to the ever more urgent problem of the future of the social sciences, of their structures and objectives, and of what one may reasonably expect in the way of useful results for the shaping of the future organization of human society. The papers are presented at a time of major crisis in the social sciences in which a combination of generalized disappointment, political pressures of various kinds and an increasingly troubled global economy combine to call into question many of the problem solutions hitherto generated by social scientists in various fields.

Professor K. William Kapp (1910-1976), who authored these papers, was an economist whose interests stretched much beyond his specific field because he early on took the view that economists simply could not take a narrow and parochial attitude towards their field; that the shaping of the economy could not be undertaken without careful attention to other aspects of society, and that especially the implementation of economic policy required attention to other aspects of the social sciences.

Professor Kapp is perhaps best known for his work on the social costs of economic activities, focusing, in his later years, on the environmental effects of industrialization.[1] The requirements of the social sciences in the modern context, however, also concern him greatly and his interest was reflected in a 1961 volume, Toward a Science of Man in Society[2] as well as the collection of articles presented here, two of which precede the book while others follow up, ending with one completed just before his death in 1976.

The current crisis of the social sciences has its roots in a basic controversy over what the social sciences are really supposed to accomplish. A science generally may be considered as a purely investigative process, that is, as a way of generating new knowledge and understanding. In doing so, it must be descriptive and analytical and ultimately be able to define regularities of behavior, processes of change and other phenomena that usually are identified as the results of scientific endeavor. Its ultimate success in this sense is the predictive value of these results.

A second very important point, however, is the role of the social sciences in public policy formulation. This requires a judgment as to what ought to be and of how to get there; in other words, the results are used prescriptively as well as predictively. It is in this area that much of the controversy has arisen, primarily because of the way in which social science and scientists have associated with governments of various kinds. In the last generation, this association has had powerful effects on such social elements as health care, the legal structure, human rights, civil liberties and the rights of minorities, environmental problems, working conditions and the organization of work generally, personal conduct, family structure, cultural patterns, and many other aspects of human life.

Inevitably, the formulation of the public policies underlying all this ran into political conflicts. In the United States particularly, the eventual outcome was a sustained attack on what may loosely be called the liberal resolutions of social science problems. Whether conservative or neo-conservative, the attack has been rather basic and fundamental, perhaps expressing itself best by the increasingly prevalent cliché to the effect that "it is useless to throw money at problems." At times, this attack takes the form of questioning the very desirability of human beings organizing themselves in order to solve common problems; at the very least, the undesirability of spending money is put forth as a policy in itself, without realizing that, conversely, not throwing money at the problem will not make it go away either. This is not the place in which to recount the arguments and counterarguments in major detail. Much of Professor Kapp's work in this volume addresses itself to these problems, albeit within a framework of civilized academic discourse and disputation, rather than the more polemical environments of public debate. Nevertheless, the existence of the current attack and resulting controversies makes the whole subject highly topical. As matters are again called into question that had been presumed to have been definitively settled, as policies discredited years ago are again being touted, Kapp's clarion call for a humanization of the social sciences is a welcome counter to these basically defeatist sentiments.

A major problem in the current situation is

not actually posed by an adversarial condition between governments on the one hand and social scientists on the other. Rather, social scientists themselves are to be found on both sides of the issue. In the United States, neo-conservative critics are frequently social scientists themselves even though they may still represent minority opinions within their respective disciplines.

The conflict within the social sciences, however, is frequently not merely a result of different results from scientific analysis. Rather, it often is a conflict between those who trim their sails in accordance with government policies in order to retain a position at the seats of power (or, perhaps more precisely, at its footstools), and those who are guided by broader visions of professional purpose. As the economic crisis deepens and security diminishes in the wake of an accelerating arms race, the conflict is increasingly between those concerned with allocating the sacrifices required by such a widespread deterioration, and those who see the purpose of the social sciences as bringing improvements in the human condition. For those in the former group, the implementation of policies is determined first of all by working backwards from the ever more burdensome budgetary constraints. The criteria of human needs which Kapp wants to see as the essential starting point of the social sciences, take a poor second place.

In the United States, a further complicating factor arises from some severely misunderstood historical experiences. The view is firmly entrenched that the social reforms of the New Deal in the 1930's had really failed to heal the economy and that the Depression only ended as a result of the boom as preparations for World War II accelerated. However, it is at least equally clear that if $80 billion ($500 billion in 1984 dollars) had been pumped into the economy for any constructive purpose, like housing, transportation, or new industrial investment, instead of the war effort, the Depression would have ended equally effectively and with more productive implications for the nation's future. This alleged experience was further reinforced by the fairly rapid elimination of Great Society programs as the Vietnam War was escalated. This time, of course, there was no boom, only inflation, and general industrial deterioration, a condition that became known as stagflation. Nevertheless, the disappointing results of these

programs are being ascribed to their inherent defects rather than to the equally plausible point that they never had a chance since they were never adequately funded.

As a result, governments appear to have no difficulty in finding social scientists of one sort or another who can propound quite seriously policies that would have been considered completely unacceptable but a short while ago. This condition is most obviously prevalent within economics itself, as economic miseries are being accepted that, again but a short while ago, would have been considered politically disastrous for those responsible for them. As far as social scientists are concerned, however, this has led to something of a crisis of integrity.

It is a condition with a long history. The Roman philosopher Phaedras already notes that "alliance with the powerful is never safe." In a scathing attack on "establishment" intellectuals, Malcolm Muggeridge says "there is nothing worse for intellectuals than to attach themselves to authority, other than for money, or for fun at authority's expense; or, as happened in the case of Voltaire and Frederick the Great, for both . . . it is difficult to think of a single case of a writer whose talent has not been contaminated to the point of extinction by association with authority on other than hostile or subversive terms."[3] Muggeridge's notoriously pessimistic outlook may perhaps have rendered this comment somewhat extreme. Yet, anyone who has participated in debates over public policy in the last generation has had reason to be appalled at social scientists who lend their names and reputations to the propagation of utter nonsense, to the resuscitation of views which, one had hoped, had been consigned to the scrap yards of intellectual history and, worst of all, to providing intellectual legitimacy to a whole range of governmental cruelties and ineptitudes.[4]

K. William Kapp's critique of contemporary social science includes a clear awareness of the dire consequences of such policies, notably in the area of environmental disruption and damage. He notes that in economics in particular, a neglect of such factors in analysis had the advantage, if one can call it that, of making the work easier at the expense, however, of often rendering the interpretations it offered useless from a practical viewpoint. Elegance of model build-

ing superseded the traditional practical objective of science of being correct in the way nature was viewed and interpreted. Kapp sought a way out of these problems in a restructuring of the social sciences, in a plea for their return to providing an essential service to humanity, that could lead to better lives for many or perhaps for all.

In his own field of economics, his was a powerful voice in defining institutional economics which he viewed as requiring the integration of economics with other scientific disciplines. Since Thorstein Veblen initiated this approach among economists, no one has gone as far in exploring other fields of knowledge related to economics as K. William Kapp. He does not hesitate to assert that there "are no purely economic problems" and consequently, "there can be no legitimate boundary lines which separate economic analysis from the allied and related fields of social investigations. There is no autonomous problem of economic growth and development. As soon as we try to ascertain why some countries are underdeveloped and others are not, we come upon interconnecting circles within a process of cumulative causation rather than purely economic factors such as scarcities or shortages. In short, the so-called problem of economic development turns out to be not an economic problem but a sociocultural and political problem involving far-reaching structural changes."[5]

In his pioneering book, Toward a Science of Man in Society, Kapp uses insights from anthropology, biology, history, philosophy, physics, political science, psychology, social psychology, sociology and theology. But his basic criticism of "pure economics" dates back much further. In 1943, for instance, when he was 33 years old, he severely criticized the fiction of a "homo oeconomicus," i.e., of the reduction of human beings to the roles of producers or consumers.[6] Thus rationality, a useful concept for the description of human behavior, is turned into a norm, with the implication that those who are not conforming to the economist's idea of rational behavior are either backward or socially deviant. For instance, a "purely" economic analysis of consumer behavior would consider its psychological components as given without making any value judgments about them. But, as Kapp points out, this raises three problems. First, he questions the extent to which the consciousness of the researcher is free from values when he makes claims

about the psychology of the consumer. Second, trying to keep values outside the scope of one's analysis is an epistemological choice with ideological consequences. In a positivistic approach, what the "victim" of research, the consumer in this case, says, is right and can be treated as a "fact." Third, needs are largely socio-culturally determined and manipulated through sales techniques and advertising. In short, the concept of a universally valid economic rationality helps to legitimize the homogenization of behavior in the most diverse societies.[7]

K. William Kapp's critique of the claims of economics as an exact science thus goes back to the time when economists were breaking new ground, powerfully aided by new mathematical models and techniques. Of course he did not think he was alone in his criticism; in fact he pays tribute to a series of economists who "throughout the nineteenth and twentieth century ... subjected classical and neoclassical economics, the dominant orthodoxy of their time, to a searching critique ..."[8] Kapp's originality lies in the scope of his criticism and in the wide range of knowledge drawn from other disciplines that he was able to integrate into his work as an economist. In the course of this continuous process of widening his cognitive horizon, two trends became his central preoccupations. They were the compartmentalization of knowledge and the dehumanization of the social sciences.

In Toward a Science of Man in Society, Kapp concentrates on the increasing compartmentalization of knowledge and its negative consequences for the further development of science. In the present book, we have compiled a series of papers, spanning a period of 26 years (1950-1976), in which he deals with various aspects concerning the humanization of social sciences. Thus the volumes do not overlap, but are complementary. The links between the two problems, as we shall see in more detail further on, are obvious. At the end of his major work on integration of knowledge, Kapp stresses the need for a more humane social science. If the social sciences were more integrated, "the science of man in society would reverse the general trend toward the dehumanization of social inquiry which regards social processes as subject to natural forces over which man has but little control. While this dehumanization is the ultimate outcome of the departmentalized and formal analysis of

models of autonomous fictitious systems, an integrated social science would make man and human needs both the starting point and the intellectual center of its scientific preoccupations. Indeed, by making man and his essential needs for the first time the measure of our institutional arrangements and moral standards, a unified science of man in society would be one of the most important steps in the direction of a true scientific humanism that will be capable of humanizing not only social inquiry but human society as well."[9]

Such views indicate that K. William Kapp was a visionary in his generation. He spoke out on issues some forty years ago that are only now receiving some attention (even if limited) from other social scientists, governments and international organizations. It was only in 1972 that a President of the World Bank began to speak of basic human needs and only in 1977 that the United Nations University (just created) started a program on Human and Social Development, in which new values -- including qualitative ones -- were postulated as indicators of development.

K. William Kapp was among the very first modern economists who clearly expressed their disappointment with the performance of their discipline. Physicists had their awakening in Hiroshima and many of those who contributed to the development of atomic weapons never overcame that trauma. There have been many "economic Hiroshimas" in the world since 1945 if one considers the destruction of the natural environment or the number of people who have died of starvation. Putting it less dramatically, the global increase in economic misery likewise testifies to the inadequacies of economic analysis and the policies that in large part come from it.

It is true that the power of social scientists to change social reality is relatively limited. This, however, derives from the peculiar conception of science imposed on scientists by ruling powers and which the latter have largely accepted. In an earlier scientific tradition, scientific pursuit was considered a good in itself. Knowledge was produced for the sake of knowledge. Then it became accepted that knowledge-producers should influence decision-makers and inform public opinion of their findings. The present problems have created a condition where scientists must finally decide whether people should have a say in what research is to be carried out, by whom and for

whom, whether science is to express itself in language that everyone can understand, and whether they are prepared to act with people in the implementation of their findings as professional knowledge-producers. An evidently rising tide of political and politico-religious obscurantism shows the risks to all, scientists and non-scientists alike, in such reformulation of agendas and social relationships. As Kapp argues convincingly in Chapter 4 of this volume, the dehumanization of social scientific thought is obviously a parallel phenomenon to the dehumanization of social reality.

The practical question about Kapp's social science epistemology is how he envisages change. Can science be humanized in an inhuman environment? Kapp believes that scientists are partly responsible for the dehumanization of society and that they must now assume responsibility for redressing the situation as part of their professional ethics. In a real sense, they must put their organizational and intellectual house in order. Kapp makes four points in this connection.

First, a de-emphasis of overspecialization and the integration of social knowledge will contribute to the humanization of science. One can also put it the other way around and say, with Kapp (see Chapter 1) that the "humanization of the science of economics [calls for] an assimilation to its specific purposes of a validated concept of man and human nature and ... an inquiry into the repercussions of institutional arrangements of human development" and that this "points the way ... to the solution of the problem of integration of social knowledge ..." This cannot be done through a return to pre-positivistic science, to some ancient philosophy or religion, nor through the repudiation of contemporary research techniques of empirical data-gathering. A new social science epistemology cannot simply consist of doing the opposite of what is rejected (see Chapter 5). It can only be found through a process of dialectical imagination, retaining some of the acquired knowledge and methodology, abandoning some, and adding new values, ideas and data. Similarly, an alternative life style aimed at the humanization of the social environment will not be achieved through the return to a romanticized pre-industrial way of life or a renunciation of technological developments. The problem is how to utilize contemporary science and technology in

a different way (see Chapter 4).

At this point in the development of science, most scientists consider the idea of integration as utopian, and they occasionally speak of it with contempt. Kapp expresses the hope that "we may still see the day when the term dilettante and amateur refers to those who insist upon viewing social problems in isolation from their social context and are willing to analyze models with linear relationships without reference to the social space or time (or sociocultural environment) in which such relationships may actually occur."[10] He points to the danger of social research degenerating into "a series of meaningless, isolated and trivial studies." But "there can and must be specialization. In fact there will be experts who devote themselves to the full-time study of particular problems but such specialization will be in accordance with the nature of the problems under investigation. Instead of studying merely separate aspects of vital social problems from the perspective of a particular discipline as in the past, the social scientist trained in the techniques of integrated social analysis is committed not only to view the problems within the social context but to follow his problems wherever they may lead."[11] As J. M. Clark said; "... this comprehensiveness is scientific even if it involves some sacrifice of other qualities for which science likes to strive."[12]

The second major aspect of Kapp's epistemology, linked like many others to the preceding one, is the transdisciplinary use of common concepts. He started simply with the concepts of man and human nature and later, in his 1961 book, went into more detail by developing man and culture as the two central concepts involving the elements of "social context, social structure, social process, social causality, social law, social reality, social action, and time and space."[13] There could of course be many more, such as function, role, relativity, dignity or equity. All of these could be of great relevance to psychology, social psychology, sociology, anthropology as well as economics. Unfortunately, for reasons which stem partly from the institutional structure of universities and are partly linked to the professional pride and interests of specialists, most disciplines tend to monopolize certain concepts; economics deals with wealth, political science with power, anthropology with culture, sociology with society, and so on. It

is not certain, in spite of frequent obeisances toward interdisciplinary approaches, whether social scientists really mean it when they say that these separations are now outdated and will soon be overcome. For the present, compartmentalization helps keep things "simple" and thus leads to the fallacy succinctly defined by Daniel Yankelovich:[14]

> The first step is to measure whatever can be easily measured. This is okay as far as it goes. The second step is to disregard that which can't be measured or give it an arbitrary quantitative value. This is artificial and misleading. The third step is to presume that what can't be measured easily really isn't very important. This is blindness. The fourth step is to say that what can't be easily measured really doesn't exist. This is suicide.

This brings us to a third point: it concerns the choice of the most relevant disciplines in which an economist should have enough basic knowledge to be able to work competently in his own field. To remind us where the problem lies, Kapp says that "the fact remains that the majority of economists tend to derive their conclusions from a concept of man which isolates one particular motif of human behavior and makes it the basis of their deductions. By using the fiction of the 'economic man' we gain in precision what is lost in significance and relevance for prediction. ...to shift ... so-called non-economic aspects of behavior to other disciplines such as sociology, politics, or psychology does not help the economist in his task of explaining human action and predicting economic developments ...."[15] In fact there are three fields of study that Kapp considers to be indispensable for the economist: "The only disciplines that can claim to have made any headway in the analysis of social structures and institutional interdependencies are cultural anthropology, social psychology, and perhaps sociology. It is from these disciplines that we expect the greatest contribution to the emergence of an integrated science of man in society."[16]

Fourth, there is the need to break away from a discipline-oriented approach and to choose specific problem-areas which lie at the crossroads of integration and humanization. In his own work as an economist, K. William Kapp's choices in this respect are

obviously fundamental. They are social costs, economic development and ecology.[17] This choice illustrates the logical coherence between an epistemology which places the accent on the humanization of science and the integration of knowledge and a research program which deals with the impact of contemporary industrial development on human beings, with the neglect of basic human needs in poor countries and with the damage done to humanity by the profligate use of the world's resources.

In some ways, Kapp's epistemology remains incomplete. Other authors have raised many more issues involved in the integration of knowledge, notably Jean Piaget,[18] and there have been attempts at defining a unity of science that specifically includes all the natural sciences as well.[19] Kapp, however, has probably gone further than other scholars in this subject in dealing with the problem of humanization. In this context, he shows himself well aware of the danger of lapsing into the kind of anthropocentrism that has been precisely at the root of a widespread domineering attitude towards nature and thus a principal reason why environmental devastation has so often resulted from human activities. Humanization of the social sciences is thus, in Kapp's view, in no way a rationalization of environmental malpractice, nor an excuse for redefining the desirable results of a new social science as more efficient ways of exploiting nature. An adversarial relationship between nature and humanity is an undesirable consequence of human practices and cannot be the basis of a new formulation of human needs or societies.

Universalism is another trap into which the defender of a humanistic ideology may fall. When we speak of "human nature," do we mean that all people have the same aspirations, the same needs and the same values? Kapp certainly does not share this point of view. He defines human nature by what it is not: man is essentially different from the animal world.[20] But from there on we need to recognize cultural diversity in human societies. Kapp acknowledges the diversity of individuals in each society in spite of a clear awareness of the processes of acculturation. There is "ample room for variability" and no doubt about the "diversity of behavior within the general framework shared by all members of the culture."[21] Subsequently, variations between societies are also stressed: "... the social sciences must remain skepti-

cal of all explanations which tend to attribute primary potency to one allegedly predominant and universal human motive or need." And further on: "There have been many unsuccessful attempts by philosophers, biologists, and social scientists to define the structure of human motives and the pattern of human action by formulating monistic principles of great simplicity. The social scientist must resist this temptation to find in a monistic principle the key which will open every door to the understanding of man..."[22] Just as Kapp doubts the ability of the economist to make the socio-psychological behavior of individual consumers a valid variable in his analysis (or criticizes the exclusion of this variable by considering it as "given"), he does not accept that culturally different societies can be studied in a "neutral" way, i.e. without having researchers falling into the trap of considering their concept of rationality more or less consciously as the norm according to which the behavior of other peoples should be measured.

Kapp has undoubtedly set the stage for more work on the integration and humanization of the social sciences. However, the major question we should now ask ourselves concerns the areas of research that should be given priority in order to meet the demands of a new social science epistemology, with new values underlying research and stricter professional ethics imposed on scientists.

Some of the very early concerns of K. William Kapp, not always taken seriously by colleagues of his generation and even younger scientists, are now emerging as the central preoccupation of others. In a document previously referred to, the United Nations University outlines the objective of one of its major projects as follows: "The problem to be explored in this research project is how to arrive at a deeper understanding of the new paradigms of development currently emerging, relating development to the satisfaction of human needs, material and non-material; seeing development as <u>human</u> development, the development of man, conditioned by <u>social</u> development, the development of social structures at the international, national and local levels -- at the same time being highly sensitive to factors of cultural diversity and ecological constraints." And further on: "The goals ... are listed under four headings: <u>security</u>, <u>welfare</u>, <u>freedom</u> and <u>identity</u> -- touching on politi-

cal, economic, socio-cultural and psychological dimensions of development."[23] This may sound very general and, indeed, utopian, but one may hope that some of those dealing with development will measure the difference between this vision and the one that has been at the basis of national and international development policies over the past thirty years. The project shows that some of Kapp's very early ideas about development, such as the satisfaction of basic human needs, are now at the core of serious debates on development.

On the broader issues relating to the future of the social sciences, what questions should anthropologists, social psychologists and sociologists in particular study today to help economists make their discipline more relevant in terms of satisfying material and non-material human needs? Could values be determined for defining the professional ethics of scientists which could be applied to various disciplines without forcing researchers from different cultural backgrounds to use the same tools and criteria in very diverse social environments? Where do we stand in overcoming the effects of a traditional positivistic epistemology without losing the advantages of contemporary research techniques? Are increasing abstraction or formalization of knowledge and the use of such devices as the computer making science more inhuman? Are we doing too many poorly conceived, but mathematically oversophisticated, projects? How can basic needs be fulfilled for all human beings without destroying the environment? In other words, what is the future of the emerging research area called eco-development? Do we know enough about economic behavior in different types of societies? After we have acquired some knowledge about the social costs of industrial production, and private enterprise in particular, could we relate them operationally to the social benefits resulting from an alternative life style? K. William Kapp asked these questions throughout his writings; they demand at least attempts at answers in what promises to be a troubled yet challenging future.

FOOTNOTES

1. K. William Kapp, Social Costs of Business Enterprise (1963), Reprinted by Spokesman Press, Nottingham, England, 1978; K. William Kapp,

Social Costs, Economic Development and Environmental Disruption, J. E. Ullmann (Ed.), Lanham, MD, University of Press of America, 1983.

2. K. William Kapp, Toward a Science of Man in Society - A Positive Approach to the Integration of Social Knowledge, The Hague, Martinus Nijhoff, 1961.

3. M. Muggeridge, Tread Softly, London, Collins, 1966, pp. 128-129. Muggeridge's comment comes in an acerbic essay ("The Loved One") on the hagiography that made its appearance after the assassination of John F. Kennedy; he cites especially the work of such former associates as Theodore Sorensen and the historian Arthur Schlesinger, Jr.

4. There is a considerable literature which articulates the misgivings of some social scientists over the Faustian bargains and other problems that come from governmental pressures. See, for instance, C. Wright Mills, The Sociological Imagination, New York, Oxford University Press, 1959, esp. Chapters 4 and 10. A comprehensive and vigorous statement of the issues is in Herbert C. Kelman, A Time to Speak, San Francisco, Jossey-Bass, 1968, esp. Parts I and III.

5. Kapp, Towards a Science ..., p. 201-202.

6. K. William Kapp, "Rational Human Conduct and Modern Industrial Society," The Southern Economic Journal, Vol. X., No. 2, pp. 136-150.

7. Gerald Berthoud and Fabrizio Sabelli, L'ambivalence de la production: Logiques communautaires et logique capitaliste, Geneva, Institut universitaire d'études du developpement, Cahier No. 3, 1976.

8. Kapp, Toward a Science of Man ..., p. 31.

9. Ibid., pp. 210-211.

10. Ibid., p. 202.

11. Ibid., pp. 203, 205.

12. J. M. Clark, "The Socializing of Economics," in R. Tugwell (Ed.), The Trend of Economics, New York, Appleton-Century-Crofts, 1930, pp. 34-35.

13. Kapp, Toward a Science of Man ..., p. 208.

14. Cited in Adam Smith [pseud.] Supermoney, New York, Random House, 1972, p. 286.

15. Kapp, Toward a Science of Man, pp. 32-33.

16. Ibid., p. 202.

17. See the volume in honor of K. William Kapp's 65th birthday, Rolf Steppacher, Brigitte Zogg-Walz and Hermann Hatzfeld (Eds.), Economics in Institutional Perspective, Lexington Books, 1977, especially the introduction by the editors and Fred J. Blum, "Professor Kapp's Approach to a Science of Man" (Chapter 4).

18. Jean Piaget, Epistemologie des sciences de l'homme, Paris, Gallimard, 1970, and a comment on this in Roy Preiswerk, "Jean Piaget et l'étude des relations interculturelles," in Giovanni Busino (Ed.), Les sciences sociales avec et après Jean Piaget, Geneva, Droz, 1976. In an English exposition of his views, Piaget says that "in areas where metaphysical speculation is least indulged in, such as the Anglo-Saxon countries and the popular republics ... this problem, if raised at all, is very much less acute" and notes much greater interest among "the Germanic (apart from the Viennese, with their traditional positivism) or Latin peoples." See J. Piaget, The Place of the Sciences of Man in the System of Sciences, New York, Harper & Row, 1970, p. 60.

19. See, for instance, the effort, begun in 1938, which resulted in the International Encyclopedia of Unified Science, Chicago, Univ. of Chicago Press, 1955. See especially the essays by three of the editors, Otto Neurath, John Dewey and Rudolf Carnap in Volume I. Kapp criticized the approach in the 1957 article that appears as Chapter 3 in this volume.

20. One recalls the definition of culture once offered by the British historian Lord Raglan as "broadly speaking, what we do and monkeys don't."

21. Kapp, Toward a Science of Man ..., p. 171, p. 172.

22. Ibid., p. 151, p. 157.

23. United Nations University, Report of the Planning Meeting of the Human and Social Development Programme Advisory Committee, Tokyo, 21 January 1977.

CHAPTER 1

ECONOMICS AND THE BEHAVIORAL SCIENCES

SUMMARY

As long as economics is conceived as a purely formal science of human action (praxeology) the basic concepts and findings of such behavioral sciences as psychology, sociology and cultural anthropology will be considered as irrelevant for economic analysis. However, if economics is considered as an empirical (substantive) science which starts from actual human needs and places man's dependence upon and interaction with his natural and social environment in the center of its investigation, the basic concepts and conclusions of the behavioral sciences cannot be dispensed with.

The question then arises as to the proper method by which the results of one field of inquiry can be utilized in another. Such integration is possible only if we find or formulate common denominator concepts sufficiently broad to contain and cut across the subject-matter of several social disciplines. Which particular concepts are likely to prove useful for a "substantive" science of economics depends upon the nature of the central research problems of contemporary economic analysis. Since these germinal questions of modern economics are all related to the behavior of social groups and of individuals acting as members of structured social entities the basic concepts and findings of social psychology and cultural anthropology are likely to prove most useful for the substantive-empirical economist.

Having outlined the major concepts which have proved helpful in the analysis of group decisions and the individual-group relationship the article concludes by setting forth the thesis that a substantive science of economics must be conceived from the very outset as an integral part of a science of man and culture. Such a "humanization" of economics would have the task of placing the living human being once more in the center of economic analysis and, at the same time, would provide a starting point for the solution of the urgent task of integrating our contemporary knowledge about man and culture.

The question of the relationship between economics and other behavioral sciences such as anthropology, psychology and sociology admits of two basically different answers depending on one's conception of the nature and scope of economics. If economics is conceived as a pure science which derives its theoretical conclusions from the logical analysis of *a priori* postulates (subject to direct verification by introspection) no useful purpose can be served by an attempt to integrate economics with those behavioral sciences which operate with concepts and hypotheses whose content and validity is at least in part given a *posteriori* and hence subject to indirect confirmation or refutation by empirical factual observations. Such an explicit denial of any connection between economics and the empirical behavioral sciences is in harmony with the views of those economists for whom economics is the central and most important part of a general science of human action or choice (hence "praxeology"). Thus, in the words of L. Von Mises (p. 49)[1]:

> "The scope of praxeology is the explication of the category of human action. All that is needed for the deduction of all praxeological theorems is knowledge of the essence of human action. It is knowledge that is ours because we are men; no being of human descent that pathological conditions have not reduced to a merely vegetative existence lacks it. No special experience is needed in order to comprehend these theorems, and no experience however rich, could disclose them to a being who did not know *a priori* what human action is. The only way to a cognition of these theorems is logical analysis of our inherent knowledge of the category of action. We must bethink ourselves and reflect upon the structure of human action. Like logic and mathematics, praxeological knowledge is in us; it does not come from without."

In other words, a science of economics which aims at a universal theory of human action derived logically from introspectively verified postulates, makes unnecessary and, indeed, meaningless the task of taking notice of the growing body of knowledge in anthropology, psychology and other behavioral sciences. In fact, if we regard eco-

1. See bibliography at the end of this paper.

nomics as a pure science of choice concerned with the explication of human action on the basis of introspectively verified postulates (such as the existence of a scale of preferences and an intrinsic rationality in adapting means to ends in accordance with a given preference scale) it would occupy a unique position among the various social disciplines in as much as its postulates are directly verified and neither call for, nor admit of further validation. That is to say there can be no relationship between a pure science of economics and other behavioral sciences because the two are concerned with entirely different types of inquiry.

In fact, even if the basic postulates concerning human action are considered to have at least in part an empirical basis the analysis of human behavior in the light of a given preference system and the maximization principle enables the economist to avoid any commitments to the findings of the behavioral sciences. For as Duesenberry (p. 15) pointed out, the preference system analysis "in its present form . . . is a more or less deliberate attempt to sidestep the task of making psychological assumptions. It has the advantage that it allows one to avoid getting out on a psychological limb which may collapse at any moment". Thus, whether we believe that our postulates concerning human behavior are verified by introspection (and hence do not require any further confirmation "from without") or whether we believe that the postulates rest, at least in part, on an empirical basis but consider it unnecessary to make inquiries into the motivation of the individual, the system of deductive theorems arrived at will possess only a minimum of factual content and the question of its predictive significance for concrete empirical situations is likely to remain problematical, no matter how great the precision and certainty of its theoretical conclusions.

If, on the contrary, economics is conceived as a science operating with concepts, hypotheses and generalizations which are subject to confirmation or disconfirmation by empirical observations, it is not only possible but necessary to utilize in economic analysis the findings of other sciences dealing with human behavior. In fact, ideally speaking, it would be necessary, and indeed essential to relate to and to base such an empirical science of theoretical economics upon a science of man and human behavior as it may ultimately emerge from the combined findings of anthropology, psychology and sociology. This

was the methodological conviction which all classical political economists shared with the originators of a secular social science as it emerged from its formative stages. Grotius, Pufendorf, Hobbes, Locke, Quesnay and A. Smith were all agreed that a science of politics and political economy could be erected only upon the foundation of a concept of man and human behavior. And such is still the general methodological orientation of all those economists who are working in the tradition of either the historical or the holistic school of economics associated with such names as Schmoller, Veblen, W. C. Mitchell, Spiethoff, Schumpeter, K. Polanyi, Katona and many others. For these economists it has always been axiomatic that economic science must go beyond the purely formal explication of the logical character of the means-ends relationships. In order to be relevant for the interpretation of actual relationships and sequences of events under concrete historical and institutional conditions economics must be "substantive" in the sense of taking its departure from man's actual needs and his dependence upon and interaction with his natural and social environment (K. Polanyi). Such a "substantive" empirical science of economics must utilize the findings of the behavioral sciences in the formation of its basic premises.

The nature of such an empirical science of theoretical economics differs substantially from that of a system of economic theorems deductively arrived at from introspected valuations and axioms. It neither aims at nor achieves universal validity and absolute certainty; its factual content and empirical significance are always subject to further validation and revision in the light of new findings of the empirical behavioral sciences. For, such a science of economics can never be absolutely certain of the validity of its conclusions since new findings concerning human behavior may invalidate or qualify its basic premises and call for new formulations. Its realism and empirical relevance are therefore bought at the price of a tentativeness of its conclusions which it shares with other empirical knowledge. Just as our contemporary cognition of the structure of the physical universe lacks the universality and absolute certainty of classical physics, economics as an empirical social science stands ready to revise its conclusions in the light of new empirical observations and findings.

The last 20 to 30 years have witnessed new departures in the study of man and great advances in the scientific interpretation of human

behavior. These new developments—no matter how tentative the propositions of psychology, anthropology and sociology may still be at the present time—call for a careful survey of the findings of these behavioral sciences from the point of view of their specific significance for economic analysis. Such a survey would enable the empirical economist to assimilate to his reasoning and to the conduct of his specialized inquiries those results of the behavioral sciences which are relevant for economic analysis.

Methods of integration

Obviously, the first question which calls for an answer is *how* one assimilates the findings of another discipline or for that matter of a group of related sciences to one's own work? This is a question of method and cognition which must be answered before the interdisciplinary problem between empirical economics and the newer behavioral sciences can be approached. Once the general method of integration is agreed upon it would be necessary to determine which of the findings of anthropology, psychology, sociology etc. are of particular relevance to economic theory. Obviously not every finding of these behavioral sciences is likely to be of equal significance for the conduct of economic research. The question calls for an answer from the point of view and in the light of the specific research tasks of contemporary economic analysis.

Turning first to the urgent and important question of the method of assimilating the results of the newer sciences of human behavior to economic analysis, it appears that much could be learned from a general survey of the manner in which such assimilation (integration) has taken place in the past. For example it would be important to show how earlier attempts of establishing a secular system of social knowledge proceeded from the concept of the "natural man", human behavior and natural law. For even if we can no longer accept the particular concepts of man and human behavior which Grotius, Pufendorf, Hobbes, Locke or Adam Smith utilized in the erection of a system of economic and political knowledge, the basic methodological procedures of these early social scientists have not lost their significance for the solution of the contemporary interdisciplinary problem. Furthermore, it would be of interest to indicate

how the earlier political scientists (including the classical political economists) made use of the general modes of thinking and of the basic concepts and findings of the physical sciences. Much is, of course, known about the manner in which the natural sciences have influenced the various social disciplines. Much more could still be learned from a systematic inquiry into the cross-fertilization of the various branches of knowledge in the past.

A judicious reinterpretation of the history of social thought as part of the general stream of thought both from the point of view of their continuous cross-fertilization and their final specialization and compartmentalization is likely to yield results which may be directly relevant for the contemporary problem of interdisciplinary cooperation and integration in the social sciences. Such a reinterpretation of the history of social knowledge would have to pay special attention to the role of analogical reasoning in the history of social theory and will finally have to concern itself with the merits and limitations of various current proposals for the integration and unification of social knowledge

Among these proposals the following seem to be of special interest: Integration in terms of a so-called "deeper dimension" of a new *Weltanschauung;* integration by historiography; integration by interdepartmentalized research on specific problems; unification of knowledge in terms of a common methodology and unified scientific language; integration by reduction and the use of analogies and finally the unification of knowledge in terms of common (integrating) concepts. The author believes that the most fruitful approach to the interdisciplinary problem between economics and the behavioral sciences consists in the search for and employment of common denominator concepts or of integrating constructs which because of their comprehensiveness contain and cut across the subject-matter of several disciplines[2].

2. The epistemological problems raised by such an approach to the interdisciplinary problem have been investigated by NORTHROP (1950), MARGENAU (1950) and KLUCKHOHN (1950) and with special reference to the problem of the integration of social knowledge by the writer in a forthcoming study entitled Toward a Science of Man in Society, The Hague, 1961.

The Germinal Questions of Contemporary Economic Analysis

The second and more specific question as to which of the particular concepts and findings of the newer sciences of human behavior are of special importance to economics can be answered only, as we indicated before, in the light of a clear understanding of the specific research tasks of contemporary economic analysis. As we see it the truly germinal questions of economics are all concerned with the behavior of individuals or groups of individuals acting in different situations and the repercussions of such action upon the economic process in general and the individual in particular. It will be convenient to view human behavior at the following four levels: consumers' behavior, the behavior of workers and labor unions, the behavior of enterpreneurs, investors and innovators and the behavior of various political units or government agencies.

The behavior of consumers: We need generalizations concerning consumers' behavior particularly with regard to their spending patterns which takes into account the effect on consumers' expenditures of such factors as culturally conditioned drives for higher levels of consumption, accumulated savings, changes of incomes in the past, expectations of future prices and anticipations as regards future changes of personal income. Techniques for such factual investigations into consumers' spending patterns are being developed in various quarters and it is reasonable to expect that we are well on the way to the formulation of a more "empirical" theory of consumption and savings based upon actual field studies.

There can hardly be any doubt that these studies would gain in scope and relevance if they could be related to an integrating concept of man (and human culture) to which reference has been made before. From such a concept we could expect to derive not only an empirical concept of human needs including their physiological basis (see C. R. Noyes), but also a more satisfactory understanding of the manner in which specific internalized value-orientations and social norms and their manipulations as well as various group influences and expectations may affect the allocation of consumers' incomes to different purposes under different conditions. In short, the whole concept of the so-called economic motivation of human behavior which has attracted attention throughout the last decades must be

approached afresh in the light of the more sophisticated conceptual frameworks of the newer behavioral sciences.

The behavior of laborers and labor unions: We need a more profound understanding of the response of laborers to various incentives especially in connection with the problem of labor mobility. We need information as to how laborers arrive at their decisions on the actual labor market as far as the choice of new jobs and the retaining of old ones is concerned. (For an empirical study of some of the factors which seem to determine such choices as well as the prevailing lack of information about job opportunities see L. G. Reynolds and Joseph Shister, 1949.) Closely related to the question of the determinants of the decisions of individual workers is the problem of the decision-making process in labor unions. It is not difficult to see that decisions of labor unions (and employers' organizations) are taken in a field of interpersonal power relations in which the pursuit of security (in all its manifestations) is interrelated in a complicated manner with the pursuit of satisfaction such as the desire for higher wages. Such non-wage objectives as the desire to maintain and expand the size of the union relative to employers and to rival unions, the need of the union leadership to uphold its power against rival cliques, as well as political aims do not merely represent in a vague manner parts of the economic and cultural environment in which the struggle for a larger share of the national product takes place, but belongs to the specific determinants of union behavior at any given time. To single out wage objectives as the determinants of union action is to fall into the trap of a traditional concept of social causation which attributes causal potency to one isolated factor without seeing the "field" or interactional character of the causal nexus.

Enterpreneurial behavior: What has just been said about the need for an understanding of the behavior of workers and their groups applies *pari passu* to employers and enterpreneurs. We need a "substantive" theory of the behavior of large corporate structures; we also need psychological premises which do not ignore the fact that enterpreneurial action particularly the decision to invest is a highly complex one which is neither automatic nor clearly dependable in the sense that it can be explained with reference to any single factor such as the level of the interest rate or changes in the demands for finished goods. What is required, for example, is an understanding of how

those spontaneous waves of optimism and urges to action, to which Keynes referred, come into being, of how they are sustained and may finally falter and break. This is doubtless a psychological problem of the first order to which we do not do full justice by reiterating merely what John Stuart Mill already knew, namely that it is not profits but the expectations of profits which tend to be equalized in different occupations under competition and that it is these expectations which play a major role in enterpreneurial actions. Expectations and the so-called marginal efficiency of capital are essentially psychological determinants of enterpreneurial decisions which require explanations and must not be treated simply as data. We have as yet no theory of how expectations are formed and transmitted and without such a theory we are unable to formulate an adequate theory of investment decisions.

Business cycle theory: We need to develop a conceptual framework in terms of which it may be possible to utilize our findings concerning the determinants of the behavior of each of these three categories of individuals and groups for the analysis of those cumulative and self-sustaining movements of expansion and contraction to which we are accustomed to refer as business fluctuations. The general significance of contagious group and mass influences on human behavior for the study of business fluctuations has found repeated recognition in various "psychological" theories of cyclical movements. We need a more systematic treatment of the socio-psychological factors and of the cumulative and contagious movements to which they may give rise in the light of the relevant findings of social psychology and psychology and we must face the task of integrating them into the theoretical apparatus used for the explanation of business fluctuations[3].

The behavior of political units: The increasing importance of public budgeting and fiscal policy, the persistent growth of the scope of the public economy (whether measured in terms of the relative number of people employed, or relative amounts of income originating in the public sector or the proportion of public expenditures to gross national product or expenditure) makes it increasingly necessary to place the study of the formulation of collective decisions in the center of

3. See W. A. JÖHR's successful assimilation of certain basic concepts of social psychology to the economic interpretation of cumulative business movements of expansion and contraction.

economic analysis. For this purpose we need a realistic theory of political processes based upon a concept of power and a basic understanding of the psychological and sociological roots of political behavior.

The effects of production, distribution and consumption on man: Perhaps the most crucial problem with which economists (and other social scientists) have to concern themselves is the question as to the effects of production, distribution and consumption on man and the development of the human personality. This is a question on which modern economic analysis has hardly anything to say for the simple reason that it is neither equipped to answer it nor even willing to raise it. And yet there can be no more important question calling for an answer if we want to make our inquiry into economic processes relevant for the solution of the practical problems of the contemporary world.

The Areas of Behavioral Research most useful to Contemporary Economic Analysis

Thus far we have been concerned with the central research problems in contemporary economic analysis. Ideally speaking, it would now be necessary to examine the relationships between the various terms and concepts used in economics and other behavioral sciences in order to ascertain what the different disciplines have in common and where they are dealing with distinct aspects of the problem of human behavior. Having thus established lines of communication it would then be possible for the economist to adapt and borrow what is relevant and to reject what is distinct and without bearing on his specific problems. In this way the road would be open to the much needed cross-fertilization between the empirical behavioral sciences and the way prepared for the ultimate conceptual integration required for a unified science of man and society. To repeat, what would be needed is a thorough examination of the relationship between the various strange vocabularies and seemingly unrelated conceptual frameworks which the different behavioral sciences have found useful for the analysis of what is the common problem of all; namely, the behavior of social groups and individuals who as members of larger social entities interact with specific situations in which they find themselves.

However, for the time being we cannot hope to do more than to indicate in a tentative manner some of the concepts developed by the various behavioral disciplines which appear to have the greatest utility and relevance for the above mentioned research problems of contemporary economic analysis with a view to establishing merely the most obvious points of contact between economics and related areas of behavioral research.

A science of economics which is prepared to view individual behavior within the context of a structured group setting and in reciprocal interaction with specific environmental conditions can draw upon a considerable number of partly overlapping concepts and conceptual frameworks from several behavioral sciences. Let us approach these concepts by first outlining briefly what an empirical science of economics needs to know. Above all, such a science of economics requires an understanding of the nature of the recurrent human needs calling for gratification and the manner in which these needs arise and find temporary satisfaction. In short, we must be clear about the "inner" biological and genetic determinants of human behavior. In other words, the realization that all behavior is social behavior (in the double sense that it takes place within the context of a structured social entity and in reciprocal interaction with a specific environmental situation in which the individual is placed) must not dim the economists' awareness of the relative constancy of the genetic structure and the biological determinants of human nature and human conduct. In this way we may be able to protect ourselves against a view of human nature which considers the individual as infinitely malleable and capable of adapting himself passively to all kinds of human and non-human environments without adverse effects. In this sense it would appear that neither economics nor any of the other behavioral disciplines can ever completely dispense with certain basic concepts and conclusions of biology concerning the nature of the human organism.

The second task which follows from the nature of the central problems of economic analysis is to arrive at a clear understanding of the caracter of the structured group or the organizations of which the individual is a part and within which he functions. As we have endeavored to show the most important groups and organizations from the point of view of the economist are labor unions, different

types of corporate structures, employer and farm organizations, consumer's groups, the family and perhaps other spending units. These groups and organizations constitute social or collective entities which need to be distinguished from the broader and more inclusive environments such as the structure of the economy, the social system, the political framework and the culture as a whole (by which we mean the sum total of man-made techniques and tools, the symbolic universe as well as the ideas, attitudes, customs and the corresponding behavior patterns of a society). Like these more inclusive environments the economic groups and organizations mentioned above are "real" in the sense of having the effect of influencing and patterning the behavior of individuals. (That is to say they are "real" in the sense in which K. Lewin spoke of groups as "real" if, as and when they have real effect.) Because the behavior of consumers, laborers and enterpreneurs takes place within a structured group setting, the economist cannot avoid turning to those relatively recent and still overlapping conceptualizations in terms of which these social groups and their essential properties and effects on individual behavior have been analyzed by different behavioral sciences (notably sociology, social psychology and psychology).

The questions which are of particular interest in this connection center around two interrelated problem areas: 1. The nature of the relationship between the individual and the groups and 2. the nature and determinants of group decisions. The study of the relationship between the individual and the group has long been an area of research claimed by two neighboring behavioral sciences: psychology and sociology. Whereas psychologists tended to concern themselves with the nature of the relationship from the point of view of the single individual, sociologists tended to view the relationship as a function of the inclusive group entity (see T. M. Newcomb, p. 1–5). While these different approaches have kept the two behavioral disciplines apart and prevented each from making much headway toward a unified science of human behavior for many decades, the situation appears to have changed in recent years. The latest developments in both these behavioral sciences seem to point in the direction of greater interpenetration by extending conceptual bridges from either end of the once separated territories. Just as psychologists have come to recognize "the social determinants" of behavior, sociologists have

discovered that there is much to be learned from the contributions of psychology to the understanding of human behavior. The upshot of this interpenetration has been the gradual emergence of a new and more sophisticated version of social psychology whose concepts and findings seem to be directly relevant for the elucidation of the relationship and interaction between the individual and the more inclusive group entities—as far as their relevance for the interpretation of the behavior of consumers, workers and enterpreneurs is concerned.

The explanation of the interaction between the individual and the group will have to center around the manner in which this relationship is established and maintained. The concepts which have proved useful for the explanation of the nature of this interaction consider the relationship between the individual and the group as a specific form of communication and concensus which establishes, maintains and constantly renews the ties between the individual and the more inclusive collective entity. Among the various concepts helpful for an understanding of the individual-group relationship are the following: The "self" and the "social-self" with its emphasis on the internalization of social norms and social value-orientations and their organizing functions; status, position and roles, common perception and common expectancies and self-reenforcing attitudes in response to common situations. These concepts and the related theories may provide at least the beginning for a realistic and empirically more or less verifiable interpretation of the behavior of consumers, laborers and enterpreneurs in response to changes of prices, wages, profits and costs and may also throw light on the genesis of common and contagious reaction patterns in situations marked by general uncertainty and the resulting "crowd behavior" often observed in the conduct of large groups of consumers, investors and speculators.

As far as the second aspect of social action (namely the nature and determinants of group decisions) is concerned, empirical-substantive economics will have to take account of the (sociological) theory of organization. This theory which owes much to Max Weber and is being further elaborated by current researches raises a number of questions which may prove to be relevant for the theory of the firm and the enterpreneurial behavior of corporate structures as well as for the interpretation of the action of unions and similar organiza-

tions. Among these questions are the following: The origin and basic modes of operation of organizations; the nature of their internal hierarchy (intra-organizational tensions, the settlement of internal disputes); the role of financial incentives as against such factors as social prestige and power; the genesis of organizational goals and the formulation of organizational decisions including the highly important problems of centralized versus decentralized decisions (their economies and diseconomies) and the tendency toward managerial and bureaucratic control. Concepts and theories concerning the emergence of leadership in structured organizations and groups can be expected to throw light on the manner in which leadership operates in large corporate structures and on the nature of the collective action in such important economic groups as labor, farm, management as well as other professional organizations. The concept of democratic leadership (defined in terms of participation and persuasion rather than authoritarian control and submission) may ultimately permit us to draw up valid criteria and norms for the establishment in industry and other groups (*e.g.* labor organizations) of work-processes and human relations which provide a maximum of human incentives without affecting human personality in an adverse way.

The third task which follows from the definition of the behavioral problem is the conceptualization of the environmental situation. Here the difficulty is that the situation is not simply an objectively given series of economic variables (*e.g.* rising prices, changing interest rates) but rather a constellation of factors as they are perceived in terms of the particular subjective attitudes of acting individuals or groups of individuals. In short, what is required is a distinction between the objective situation and the perceived situation and the realization that different individuals may perceive the same objective situation in a different manner. Thus an individual or group of individuals who have experienced inflationary price rises in the not too distant past are likely to perceive the same objective price and monetary constellation in a different way than others who lack such experiences. (That is not to say that past experiences are necessarily the only factors which determine our perception and our attitudes in the present.) In any event, in trying to understand the environmental situation to which the individual (or groups of individuals) reacts, the economist will find it useful to assimilate to his own reason-

ing some of the basic concepts used in contemporary theories of perception.

Apart from this, economists will have to view economic situations not in isolation but within the wider context of the social and political structure, that is to say in the light of the distribution and use of political power between different groups, and their political behavior. The concept of political power has lost almost all standing in formal economic analysis due no doubt to the implicit belief that competition offers an automatic solution of the abuse of power by a few (J. K. Galbraith). The realization that actual market situations are rarely perfectly competitive and contain usually elements of monopolistic power which can be met only by political counter-power (either by the government or by countervailing private groups or both) make it more necessary than ever for the economist to devote some attention to the analysis of power and power conflicts. Such an analysis would have the twofold objective of assimilating the phenomena of political power to economic analysis and to provide a conceptual framework in terms of which it may ultimately be possible to deal with the political decisions and collective choices underlying the formulation of economic policies. To be able to do so is becoming increasingly important in view of the growing significance of the role of governmental regulations in economic life and the increasing scope of the public economy in comparison to that of the private sector.

In conclusion we may say that since all human action and particularly the behavior relevant for economic analysis must be regarded as a form of social interaction between an individual (or groups of human beings organized in structured entities) and the situation in which the individual finds himself, the general direction of the economists' effort of finding useful and relevant behavioral concepts for the interdisciplinary tasks ahead is clear: We must turn to those areas of research and partly overlapping disciplines which operate with conceptual frameworks in which the social (interactional) character of human behavior is fully recognized without committing the error of viewing human conduct merely as a passive adaptation to environmental conditions.

The Science of Man and the Humanization of Economics

In the preceding two sections we have set forth what we consider to be the important research problems of contemporary analysis and some of the concepts and theories of the behavioral sciences which we believe to be useful for an integrated attack on those problems.

The next and final task which concerns us is the definition of the scope and nature of economic analysis as one of the behavioral sciences. This task can be approached only in the light of an understanding of the nature of the economic problem with which economic analysis has to deal. For our purposes it will be sufficient to say that the specific economic problems and the related studies of human action arise from the fact that man has to gratify his recurrent needs by interacting with a natural and cultural environment which offers him the means for such gratification only at the price of overcoming various resistances through human effort, improved techniques, specialization and exchange (C. R. Noyes). Viewed in this broad fashion the economic problem (as a problem arising from and centering around the gratification of recurrent human needs and the struggle against scarcity) becomes a general problem of human existence. To view the subject-matter of economics in this manner is equivalent to saying that the science of economics can never be an autonomous science. On the contrary, the science of economics must be conceived from the very outset as an integral part of a broader science of man and culture. Once this proposition is accepted in principle it is possible to restate the program of the interdisciplinary task at a higher level of generalization than has been possible so far. As far as economics is concerned the interdisciplinary problem becomes one of relating economic analysis to the concept of man and culture as it may eventually emerge from the integrated findings of the behavioral sciences[4].

4. Similarly, just as the science of economics must build conceptual bridges to the science of man, the emerging science of man and human behavior must never lose sight of one of the most fundamental conditions of all human existence and human behavior: namely the aforementioned fact that the environnement offers the potential means for the gratification of recurrent wants not freely but only at the price of overcoming various resistances by human efforts and improved techniques.

The practical implications of this view of the interdisciplinary problem may be spelled out in greater detail. For, if we share and take seriously the methodological convictions of the classical political and economic thinkers who considered it as axiomatic that all social theory had to be based on and nourished by a concept of man and human behavior it follows that the most fundamental and most urgent task of economic analysis is to overcome what has been called the withdrawal of the living human being from economic theory (F. Perroux, p. 10). Instead of confining itself to the search for levels of equilibrium between efforts (costs) and benefits (returns) economic analysis will have to start again from the nature of man and, what is more, must study the repercussions which the benefits and sacrifices involved in production may have on man and the human personality under given historical and institutional arrangements.

If this is granted, the next question obviously is how and where can such a general concept of man be found. The answer can only be that such a concept has to be constructed in harmony with the improved understanding of human behavior emerging from some of the findings of the newer behavioral sciences. Again, this is not to say that everything that these sciences have produced in the form of preliminary hypotheses and clinical findings must necessarily be reflected in the concept of man. If this were so we would probably never be able to develop a coherent concept of man and human behavior. Moreover, there are many areas of psychological and sociological research which have only very little if any relevance to economic analysis. In fact, there seem to be many highly speculative formulations in some of the newer behavioral sciences which may have no other purpose than to provide defenses against disconfirmation by factual observation. While economic analysis cannot and need not take into account every detail and refinement of the behavioral sciences it must and should assimilate those findings and modes of thought which have a direct bearing on the central questions of the behavior of individuals and groups in connection with the struggle against scarcity. Perhaps, the most important requirement of an adequate concept of man is that it views human behavior not in terms of isolated drives but as responses of the organism as a whole, to the total situation within which the individual acts and functions. Human action and particularly the behavior relevant for economic analysis

takes place in a field of interpersonal relations characteristic of a particular culture. That is to say in order to anticipate or "predict" human behavior it would be necessary to develop a concept of human nature and human behavior which includes the interaction of the individual with his specific human and non-human environment. Such a concept would have to include those internalized and more or less unconscious value-orientations and social norms which the individual tends to absorb during the process of acculturation and which influences behavior in virtually all situations and at all levels.

More specifically, we believe that the concept of human nature and human behavior must be a "holistic" one in the sense of being capable of taking adequate account of the totality of factors which influence human behavior. No theory of human behavior which operates with single determinants (whether the pursuit of wealth, or any other partial "drive") is likely to prove adequate for the explanation of human behavior at any level and under any of the various conditions under which man acts as a consumer, worker, entrepreneur, or member of a social or political group. In fact, any attempt to account for human conduct in terms of single drives or determinants can only yield an oversimplified picture of human behavior by singling out one factor from a number of determinants and attributing causal potency to it. A holistic concept of man and human behavior seems to emerge from the findings and writings of several cultural anthropologists and sociologists and particularly from such psychologists as K. Goldstein, H. S. Sullivan, E. Fromm and A. Maslow to name only a few among the many writers who have worked along the lines we consider most fruitful for the interdisciplinary problem as viewed from the standpoint of economics.

A holistic concept of man leads directly to and indeed contains the concept of culture. That is to say that man, due to basic biological needs and his social nature, is a culture building animal and is, at the same time, the product of his cultural environment. The implications of the holistic concept of man and culture for economic analysis are perhaps more clearly seen if we bring them in relation to such important auxiliary concepts as social interaction, acculturation and social learning, value-orientations, and social norms, social groups and social organization. All of these auxiliary concepts, as we have indicated above, can be shown to be relevant for a realistic analysis.

of the behavior of consumers, workers and enterpreneurs and their groups. In short, then, a general concept of man and human behavior is relevant for virtually all problems with which economic analysis is concerned. From it economics would be able to derive its special categories and to formulate its specific problems which, as we have pointed out, arise from the fact that recurrent human needs call for satisfaction obtainable by overcoming the resistances of an environment which offers the potential means for such gratification only at the price of human effort.

Such a "humanization" of the science of economics by means of an assimilation to its specific purposes of a validated concept of man and human nature and the inclusion of an inquiry into the repercussions of institutional arrangements on human development also points the way, we believe, to the solution of the problem of integration of social knowledge in general. In fact, no genuine integration of social knowledge can dispense with the concept of human nature and human behavior and no social analysis must shy away from the question of what given institutional arrangements do to man and human growth. In this sense we are led to the conclusion that the task of basing its analysis of social processes upon a generalized and empirically (though not necessarily experimentally) verified concept of man and thus of relating social knowledge once more to the knowledge of human behavior must never again disappear from the agenda of social research.

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CHAPTER II

POLITICAL ECONOMY AND PSYCHOLOGY*

[In this, the earliest article reprinted here, Kapp examines the use of psychological hedonism -- i.e., of the notion that human conduct is determined by a desire to maximize individual pleasure and minimize pain -- as a basis for economic analysis. What he terms its "surprising power of survival" is due to its great usefulness in furnishing a simple objective function for economic analysis, such as maximizing of income and, as Section II shows, the fundamental assumption for several important and basic economic formulations. It is, moreover, the implicit basis for modern advertising and an explicit one for a great deal of it. While it is easy to find fault with this approach, it is also true that alternatives may be, in a sense, much worse.

Human action, as Kapp puts it, "is also determined by conventions and traditions,... loyalties, religious attitudes,... instincts, appetites, habits, ..." and, as the experience of the 20th century has shown ad nauseam, these often lead in the opposite direction, i.e. to the uncritical, indeed enthusiastic, acceptance of misery. Securing such acceptance is decisively aided by modern communications technology and methodological refinements. In a sense, it is strange to discuss hedonism in a time on the one hand, of what is called the "me-generation" and, on the other, of continuing salability of politico-religious obscurantism and cruelty, and of economic regression and stagnation as good for the national fiber. In a sense, such a contradiction is no more than the fact that an indulgence in the more ample forms of hedonism has always been a privilege of the powerful in society at the expense of everybody else.

Kapp rightly notes that there is no current psychological answer to the problems raised; indeed, with the cooperation of so much of the social sciences for these regressive political ends, the prospects are not good. Still, the remedy proposed, i.e. that of integrating into the study a far wider array of individual and group behavior patterns, is a sound one. - J.E.U.]

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THE SURVIVAL OF HEDONISM AND THE RESEARCH TASKS OF THE FUTURE

A substantial part of economic analysis deals with the "repercussion-effects" of individual and collective decisions. In fact, if we were to define the subject-matter of economics in terms of the central preoccupation of economists we could say that economics is concerned with the analysis of the repercussions of human action insofar as it has to do with the private or collective allocation of scarce resources between competing private and social ends. Thus we study human actions and their effects when we analyze the decisions of individuals with regard to the choice of specific consumers' goods and the allocation of income to present and future consumption. We deal with the repercussions of human actions when we describe or "predict" the decisions of business firms with regard to price, output and investment. Again we trace the effects of human actions when we analyze the consequences of governmental decisions concerning the allocation of resources to collective purposes (fiscal policy) and of economic policies in general.

It is, therefore, not surprising that economic theory, whether implicitly or explicitly, has always made use of psychological premises concerning the motives of human behaviour. What is perhaps astonishing is the fact that the importance of psychology for economic analysis has not always been fully acknowledged. In fact, from time to time it has even been suggested that economics deals with the problem of choice and decision-making in a purely formal way only (i.e. without concerning itself with the motives of the decision) and hence is not concerned at all with the psychological determinants of human action. Indeed, it is sometimes argued that any attempt to explore the motives of human behaviour would be to overstep the methodological boundary which is supposed to separate economics from psychology. These views, according to which the economist must take human action for granted—"as he finds it," so to say—have enabled many economists to continue to base their theoretical deductions upon the psychological insights of 18th century rationalism. In fact, this survival of hedonistic psychology can be traced from the

economic man of classical political economy or the analysis of consumers' choices in terms of indifference curves in contemporary theory to Keynes' "fundamental psychological law" according to which people are said to be disposed "to increase their consumption as their income increases, but not by as much as the increase in their income ..." (1).

The purpose of the present article is 1) to account for the extraordinary power of survival of hedonism in modern value analysis; 2) to describe the major psychological premises which underlie such important tools of analysis as the quantity theory of money, the consumption function, the multiplier and the accelerator, and to indicate their major limitations; and 3) to suggest ways and means which would make it possible to establish alternative psychological premises for the tracing of the "repercussion-effects" of economic decisions.

I

The surprising power of survival of hedonistic principles in economics is due to several reasons. In the first place there is the extreme methodological usefulness of hedonism for purposes of economic theory. Only on the basis of the assumption of rational conduct it is possible to formulate social and economic problems in a fashion similar to that in which the physical sciences viewed, until recently, the events of the physical world. Nobody has made this as explicit as Alfred Marshall when he pointed out that economists have established their theoretical work on a scientific basis by "being concerned chiefly with those aspects of life in which the action of the motive is so regular that it can be predicted, and the estimate of the motor-forces can be verified by results" (2). In other words, the political economist, impressed by the success of the physical sciences and their methodological procedures, insists upon placing his work upon a scientific basis by concerning himself with problems "which are grouped as economic because they relate specially to man's conduct under the influence of motives that are measurable by a money price [and hence] are found to make a fairly homogeneous group" (3). Thus it is not the nature of the economic problem which determines the method but the method and

(1) J. M. KEYNES, *The General Theory of Employment Interest and Money* (London, Macmillan and Co., 1947), p. 96.

(2) ALFRED MARSHALL, *Principles of Economics* (8th ed.) (New York, The Macmillan Company, 1930), p. 27.

(3) *Ibid.*, p. 27.

the ultimate purpose of obtaining measurable i. e. "scientific" results which determines the kind and the selection of the problems to be investigated.

Second, the rationality assumption provides a seemingly solid foundation for the imputation of regularity and orderliness into the economic process—a procedure which must be regarded as an essential characteristic of classical as well as of neo-classical economic analysis. In fact it can be shown that virtually the entire system of theoretical conclusions in favor of the classical system of natural liberty can be derived from the assumption of rational human conduct (1). To hold on to this assumption despite considerable logical and factual evidence to the contrary may indeed belong to those subconscious defense mechanisms with the aid of which economists were able to preserve the agreeable delusion about the essential rationality of the economic process and thereby were able to avoid anxiety-generating conclusions which might have become necessary if they had "permitted themselves to recognize all ... disturbing 'non-economic' factors" (2) in society.

Third, the survival of economic hedonism is also due to the fact that in our culture an ever increasing proportion of our daily activities seems to be devoted to the pursuit of sensate and sensual pleasure and happiness. Indeed, it is possible to point to a gradual extension of elements of hedonistic rationality into new spheres of life. What is more, man and especially the business man—product of a hedonistic culture that he is—likes to believe that he is actuated by a careful and deliberate cost-reward calculation. In fact, the idea that man may be motivated by many diverse and complex forces and that even the profit motive is in reality a highly complex motive consisting of many components which may not all be reducible to simple monetary terms is not yet easily accepted in our time.

Finally, the errors involved in generalizing the basic premises of hedonism into a general psychological presupposition for purposes of theoretical analysis are not quite as self-evident as Marx seemed to imply when he declared that Bentham "with the dryest naïveté takes the modern shopkeeper, especially the English shopkeeper, as the normal man" (3). In fact, the philosophical critique of utilitarianism has been much

(1) H. SIDGWICK, *The Principles of Political Economy* (London, 1901), p. 29.

(2) WALTER A. WEISSKOPF, "Psychological Aspects of Economic Thought," *Journal of Political Economy*, vol. LVII, August 1949, p. 307.

(3) KARL MARX, *Capital* (Chicago, Charles H. Kerr and Company, 1906), vol. I, p. 668 n.

less adequate than is usually believed. In the first instance the critics tended to conceal the truly democratic and progressive elements of the utilitarian psychology which, "by making man's own experience of pleasure and happiness the sole criterion of value ..., shuts the door to all attempts to have an authority determine 'what is best for man' without so much as giving man a chance to consider what he feels about that which is said to be best for him" (1). Furthermore, in their correct emphasis on the non-rational factors in human behaviour such as habits, instincts and impulses, the critics of utilitarianism often failed to point to the importance of and the need for reflection and intelligence in conduct (2).

Can it really be said that utilitarian psychology has survived in contemporary tools of economic analysis and if so, what are the major limitations of this utilitarian psychology whose truly progressive elements cannot be denied? *Prima facie* the present version of the theory of demand seems to be a reaction against the utilitarian presupposition upon which all theories of subjective value seem to be based. It represents an attempt to meet the old argument against any quantitative measurability of marginal utility. Thus, it is believed that "the great merit of the indifference function is its ability to encompass these factors [i.e. "all the psychological and sociological factors which determine consumer choices"] in their full generality and complexity and yet be free of irrelevant or erroneous assumptions about human psychology" (3). Is this really the case? Are indifference curves which list equal amounts of total satisfaction derived from various combinations of quantities of two commodities actually free of irrelevant or erroneous assumptions about human behaviour and choice? Does the assumption of a direct and evidently precise calculation of the *total* satisfaction obtainable from different amounts of two commodities in the form of an internal barter transaction meet the objections

(1) ERICH FROMM, *Man for Himself* (New York, Rinehart and Company, 1947), p. 15.

(2) JOHN DEWEY, *Human Nature and Conduct* (New York, The Modern Library, 1930), p. 222.

(3) W. A. WALLIS and MILTON FRIEDMAN, "The Empirical Derivation of Indifference Functions" in *Studies in Mathematical Economics and Econometrics* (ed. Oscar Lange et al. (Chicago, The University of Chicago Press), p. 176. Similarly J. R. Hicks says: "If one is a utilitarian in philosophy, one has a perfect right to be a utilitarian in one's economics. But if one is not (and few people are utilitarians nowadays) one also has the right to an economics free of utilitarian assumptions." *Value and Capital* (Oxford, at the Clarendon Press, 1939), p. 18.

which the critics of hedonism have advanced against the basic psychological premises of Jevons' theory of marginal utility? In short, do the difficulties in the way of accurately measuring marginal utilities represent the only limitations of the hedonistic calculus?

Recent discussions of these questions lend increasing support to the view that indifference curves, while avoiding the minor difficulty of a precise distinction and measurement of marginal utilities, are still open to all the major objections advanced against the validity of the utilitarian calculus (not to mention certain others which have to do mainly with the fact that the modern theory of consumers' preference and choice seems to be incapable of assimilating to its reasoning such facts as product differentiation, institutional price controls, goods of infinite utility (1) and neglects completely the interpersonal interdependence of all preference scales). Like the older marginal utility school, the new theory is based upon the assumption of a given and stable scale of preference, which while it may not permit the consumer to say exactly by how much he prefers one commodity or one bundle of commodities to another, nevertheless enables him to calculate the relative total utilities and typically induces him to allocate his income in a manner consistent with such a scale. This assumption of a given and relatively stable scale of preference, as J. M. Clark has again pointed out recently, is common to all utility theorizing including that of the indifference curve variety (2). As such it retains all the essential features of the hedonistic calculus and accounts for the unrealistic and misleading precision of the modern version of the theory. Essentially the consumer is still presented as the economic man actively engaged in the calculation and comparison of (total) utilities gained and lost (in the form of alternative satisfactions) and the formulation of a plan of action designed to maximize the total amount of utilities in accordance with the (pre-established) scale of preference.

This is not the place to subject the assumption of a hedonistic calculus to a detailed and exhaustive analysis. In so far as the hedonistic psychology asserts that human action aims at a maximization of some non-observable magnitude called utility, it can be shown, as Schumpeter pointed out, "to boil down to the triviality that, whatever the data and in partic-

(1) R. T. Norris, *The Theory of Consumers' Demand* (New Haven, Yale University, 1944), pp. 44–50.

(2) J. M. Clark, "Realism and Relevance in the Theory of Demand," *Journal of Political Economy*, LIV, August 1946, pp. 347–353.

ular the institutional arrangements of a society may be, human action, as far as it is rational, will always try to make the best of any given situation" (1). In other words it represents merely a definition of rational behaviour. If, on the other hand, we try to give some empirical content to the non-observable psychic magnitude called utility by saying for example with Max Weber that the ultimate driving force of all economic activity in a market economy is the maximization of income (2), the proposition is false for two reasons: First, even if we grant for a moment that income maximization is a goal of economic behavior it does not thereby become the ultimate driving force of all economic activity. There are other driving forces of economic activities such as traditions and conventions, instincts, emotionally determined loyalties, religious attitudes and the tacit belief in the validity of certain ultimate values of which Max Weber is fully aware in other parts of his analysis (3) and to which we will turn presently. Second, income maximization is simply *not* the only goal of economic behaviour or human action in so far as it is economically relevant, i.e. in so far as it may have economic consequences. Economic behaviour (whether individual or group) is also directed toward security —a complex goal which, as will be shown below, may or may not be in conflict with the maximization of income.

Perhaps the most basic criticism of the assumption of economic hedonism derives from the first of the objections just advanced. If human action is also determined by conventions and traditions, by traditionally determined loyalties, religious attitudes and beliefs in the absolute validity of moral, esthetic and other values—not to mention instincts, appetites, habits and similar factors, it is bound to turn out to be much less rational than the hedonistic calculus assumes. It is true, these other driving forces need not make economic behaviour "irrational" but they are likely to make it "non-rational" or "non-logical" in character. Now, "non-rational" behaviour as for example instinctual behaviour "may work out in results that are, as Pareto says, 'marvelous.' But also, obviously, it may not. 'Instincts' may miss fire, in a sufficiently variable environment, and traditional ways of behaviour, the products of unplanned

(1) J. A. SCHUMPETER, *Capitalism, Socialism and Democracy* (New York: Harper and Brothers, 1942), p. 77 n.

(2) MAX WEBER, *The Theory of Social and Economic Organization* (New York: Oxford University Press, 1947), p. 320.

(3) *Ibid.*, pp. 126, 127, 130.

growth and cumulation, may finally work out in all sorts of 'stresses' for the people who have been holding to them (1)."

The second objection to the hedonistic assumption of modern value theory questions the adequacy of a psychological framework which assumes income maximization as the sole goal of economic behaviour and fails to inquire into the component parts of human motivation. No doubt, economic activities are undertaken and carried through by individuals and groups for self-regarding reasons. The goal of economic action is indeed to make provision for our own interests whether they be ideal or material. But in this pursuit of our interests we are guided at any given time by a concern for security, self-esteem and integration with the group and the culture of which we are a part. In fact, it may be useful, as some social psychologists and psychiatrists suggest, to classify human performances into two basic pursuits according to whether the end state sought is one of satisfaction or one of security. Whereas satisfactions may be said to be rather closely connected with the biological organization of the human body, the pursuit of security pertains more closely "to the culture, to the social institutions, traditions, customs and the like, under which we live" (2). In short, this pursuit of security which may become much more important than the impulses resulting from the feeling of hunger or thirst or lust, seems to have its source in the individual's desire to gain the recognition and approbation of his fellow men and thus to achieve social standing within the group and the culture of which he is a part. The relative strength of this drive for security evidently differs from person to person. It seems to be related to the individual's feeling of anxiety which varies in different persons and under different conditions to the extent to which the individual feels isolated, powerless and frustrated in his various endeavors and hence without adequate recognition and response in his inter-personal relations. Now the problem is not that the pursuit of satisfaction and the drive for security are necessarily in conflict with each other. On the contrary, the latter can be satisfied by success in the acquisition of money and wealth and the pursuit of conspicuous satisfaction,

(1) LOUIS SCHNEIDER, *The Freudian Psychology and Veblen's Social Theory* (New York: King's Crown Press, 1948), p. 17. See also ROBERT K. MERTON, "The Unanticipated Consequences of Purposive Social Action," *American Sociological Review*, I, 1936, pp. 894–904.

(2) H. S. SULLIVAN, "Conceptions of Modern Psychiatry," *Psychiatry*, III (1940), p. 6.

particularly in an acquisitive society. But the important fact is that the pursuit of security seems to derive its energy, at least in part, from a level of human consciousness which is pre- or subconscious in character. In other words, the behaviour patterns characteristic of the drive for security are even less subject to reasoned and logical calculation than the drive for satisfaction.

Finally, it is important to note that consumers' preferences are also influenced by persons who have a self-regarding interest in the outcome of their choices. The commercial manipulation of preferences in the course of which often the most recent insights of modern psychology are used against the consumer raises further doubts about the practice of regarding the individual's choice at any given time as the visible evidence of a given and stable scale of preference with which he arrived in the market.

This conclusion receives additional support if we consider that what economists accept as "ends" are in reality subject to further exploration at any given time. This was made quite clear by Dewey when he pointed out that what is usually considered as "ends" are "not strictly speaking ends or *termini* of action at all. They are terminals of deliberation ..." (1). The process of deliberation, in so far as it occurs at all, is an exploration in one's mind of the possible implications (i.e. consequences) of opposing ends not in order "to do away with this opposition of quality by reducing it to one of amount" (of pleasure) but in order "to reveal qualitative incompatibilities by detecting the different courses to which they commit us, the different dispositions they form and foster, the different situations into which they plunge us. In short the thing actually at stake in any serious deliberation is not a difference of quantity, but what kind of person one is to become, what kind of self is in the making, what kind of a world is making (2)." If this is the essence of all deliberation and of all serious choice—and there is no difference in principle between minor and serious decisions—it is not difficult to see that the assumption of an "economic" consumer with a stable and quantitative scale of preferences is not tenable. Indifference curves may eliminate quantitative comparisons of marginal utilities but by assuming individual preferences to be given and constant, they tend to perpetuate the precision of the utilitarian calculus which in turn makes it possible to preserve the fictitious determinateness of modern equilibrium analysis.

(1) JOHN DEWEY, *op.cit.*, p. 223.
(2) *Ibid.*, pp. 216–217.

Does the hedonistic calculus perhaps provide a more adequate psychological premise for the analysis of the motivation and actions of other decision-making agents in our economy? For example, how relevant is the hedonistic calculus for the actions of the entrepreneur? In the first place we cannot be quite sure what the real determinants of entrepreneurial decisions are. With our present inadequate knowledge as to who exercises the "entrepreneurial function," it may turn out that there are not only more than one person but also more than one objective guiding entrepreneurial decisions. Indeed, entrepreneurial behaviour at any given time is likely to be the result of the interaction of several conflicting drives (such as the desire for stability and continuity, power, social approval, as well as competitive aggressive impulses). In fact, in a culture in which the striving for power, prestige and social status and the pursuit of security can be satisfied by expanding the size of one's operations and by manipulating large amounts of capital, it would be surprising if these and similar drives did not play an important role in the group decisions which guide the destinies of our corporate empires. If this line of reasoning is correct it would appear that entrepreneurial decisions are more likely the result of a compromise between competing motives and are neither simple nor sufficiently quantitative in character to be reduced to monetary terms. Furthermore, if conflicting motives must be regarded as the drives determining entrepreneurial action, the behaviour patterns resulting therefrom are bound to be much less rational (in the sense of "reasoned") than the hedonistic calculus assumes. It is true, reason may still and doubtless does play a role in the process of arriving at a compromise between conflicting drives and the outcome may be described as a kind of balance of opposing forces, but the process of establishing the balance and hence the final action is far removed from any simple cost-reward calculus.

This conclusion finds additional support if we consider next that entrepreneurial action or inaction and particularly the decision to invest or not to invest have to be made more often than not under conditions in which nobody can be certain of what is going to happen. Their outcome is not so much a matter of mathematical probability which can be calculated with reference to certain data but depends to a considerable degree on developments which are surrounded by an unmeasurable uncertainty, to use a term of F. H. Knight. Indeed, the decision to invest has often to be arrived at without relevant evidence or with reference to data of "in-

trinsic doubtfulness" (1). Hence entrepreneurial decisions—as in fact human action in general—feed on those waves of contagious optimism and pessimism for which J. M. Keynes coined the term "animal spirits." "A large proportion of our positive activities depends on spotaneous optimism rather than on a mathematical expectation, whether moral or hedonistic or economic. Most, probably, of our decisions to do something positive, the full consequence of which will be drawn out over many days to come, can only be taken as a result of animal spirits—of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities. Enterprise only pretends to itself to be mainly actuated by the statements in its own prospectus, however candid and sincere ... Thus if the animal spirits are dimmed and the spontaneous optimism falters, leaving us to depend on nothing but a mathematical expectation, enterprise will fade and die ... (2)." Surely, then, the hedonistic cost-return calculus is much too narrow and too precise a framework for the analysis of entrepreneurial action.

Finally, there is the empirical evidence which indicates that the entrepreneurial determination of output and price takes place in a manner quite different from that which marginal analysis and the assumption of economic rationality have led us to believe (3). The average entrepreneur has not even a notion of marginal costs and marginal returns and, even if he had, he would be unable to calculate them with any reasonable

(1) This is a term with which Bertrand Russell refers to a kind of probability which is not of the mathematical kind not only because it is neither relative to some arbitrary data nor indeed to any known evidence "but also because it has to take account of something which lies wholly outside the province of mathematical probability." See BERTRAND RUSSELL, *Human Knowledge* (London, George Allen and Unwin, Ltd., 1948), p. 359.

(2) J. M. KEYNES, *op. cit.*, pp. 161–162. The above passage, as indeed the entire chapter from which it is quoted, bears eloquent testimony not only of Keynes' psychological insight at least in so far as entrepreneurial action is concerned but also indicates how fundamental his rejection of econometrics must have been no matter how much his theoretical model may have lent itself to exact formulation by mathematical economists. Cf. JOSEPH A. SCHUMPETER, "Keynes and Statistics," *Review of Economic Studies*, XXVIII, 1946, p. 196.

(3) R. L. HALL and C. J. HITCH, "Price Theory and Business Behaviour," *Oxford Economic Papers*, II, May 1939, pp. 12–45; R. A. LESTER, "Shortcomings of Marginal Analysis for Wage-Employment Problems," *American Economic Review*, XXXVI, No. 1, March 1946, pp. 63–82.

degree of accuracy because he has only the vaguest idea of the shape and elasticity of the supply and demand curve for individual commodities. Hence it is not surprising to find that most business men set their prices and determine their output by estimating average costs and by adding a certain mark-up—a procedure which is basically different from the economic calculus in terms of marginal costs and marginal returns (1).

II

So far we have been concerned with the survival of the hedonistic calculus in traditional value analysis. The next step in our analysis is concerned with the psychological assumptions which underlie such important tools of analysis as the quantity theory of money. Early formulations of the quantity theory asserted merely the existence of a rough correlation between the quantity of money and price levels in the long run. With full utilization of productive factors taken for granted, no attempt was made by the theory to account for the transition from one level of employment to another. Its emphasis was on the long-run relationship between changes of money and changes in price levels. Crude though it was, it served as an adequate tool of analysis of those states of affairs for the explanation of which it was designed, namely the price movements resulting from the influx of substantial amounts of precious metals into Europe from the new world. Used in this context, the quantity theory can, indeed, be regarded as "a rough approximation to the truth (2)." Nor have we any quarrel with those formulations of the quantity theory of money which assert merely the existence of a basic equation of exchange between the total amount of money spent and the value of the total product sold during a given period of time. However, the quantity theory fails as a tool of analysis if it is used to explain the relationship of money and prices in the short run, i.e. during periods of transition from one level of employment to another. A causal and roughly proportionate relationship between the total amount of money spent and the average level of prices in the short

(1) This conclusion is *not* refuted by the fact that the most profitable price is equal to the marginal cost plus a fixed percentage provided the elasticity of demand is constant. The elasticity is precisely not constant in a dynamic economy. Nor do the average variable costs correspond to the marginal costs except perhaps for a small range of output variations.

(2) A. G. HART, *Money, Debt and Economic Activity* (New York: Prentice-Hall, Inc., 1948), p. 144.

run can exist only if it is assumed further that there exists a mechanical link between the quantity of money and total spending, for it is obviously only through spending (i.e. its effects on demand) that changes in the volume of money could exert the alleged influence on price. Only if we assume a mechanical, i.e. non-psychological, relationship between money and spending could these two magnitudes possibly be related causally and proportionately. It is precisely this mechanical relationship between the amount of money and the level of spending which has no counterpart in reality (1) and hence the quantity theory of money breaks down quite apart from the fact that prices need not and do not change in proportion to total spending.

But while the mechanical behaviour patterns assumed by the quantity theory of money are now more or less generally understood and abandoned, it is nevertheless true that such modern tools of analysis as the consumption function and the multiplier also assume an essentially stable and mechanical relation between changes of income and spending for consumption. For evidently to relate consumption expenditures (and savings) solely and in a determinate fashion to income fails to take into consideration that the proportion of the total income a person is likely to spend (and to save) depends not only upon the absolute size of his income but also upon the volume of his accumulated savings, his experience and expectations with regard to price developments, his interpretations of his income earning capacity in the past and in the future, as well as upon the whole series of psychological processes which make the attainment of higher standards of consumption a matter of social status and self-esteem and hence of anxiety for man in contemporary society (2). To disregard these determinants of individual behaviour and to relate the propensity to consume (and to save) both of the individual and of the nation to income alone is not a simplification for purposes of theoretical

(1) See the calculation of the historical ratio of money to income by A. H. HANSEN, *Monetary Theory and Fiscal Policy* (New York: McGraw Hill Book Company, 1949), ch. 1. It may be mentioned that contrary to Hansen's implication, Cantillon was fully aware of the secular trend of an increasing ratio of money to income and hence considered it not possible to determine the exact degree in which new money may give "a new turn to consumption and even a new speed to circulation." RICHARD CANTILLON, *Essai sur la Nature du Commerce en général* (ed. H. Higgs) (London: Macmillan and Company, Ltd., 1931), p. 181.

(2) J. S. DUESENBERRY, *Income, Saving and the Theory of Consumer Behavior* (Cambridge, Harvard University Press, 1949), pp. 28–32.

analysis or merely a first step in a gradual approximation to reality. It is a distortion of reality. It reflects a point of view which seems to regard human action as an essentially automatic and mechanic reaction to changes of income. The fact that human action (i.e. the decision to spend or not to spend) is regarded as an essentially dependable and determinate reaction to one variable only has the effect of imputing once again into economic life that basic regularity the belief in which, as we have pointed out above, has shaped economic thought since its inception.

As a matter of fact, it is possible to regard the Keynesian consumption function as closely related to the utilitarian psychology of neo-classical value analysis. When Keynes dignified the relation between increases in income and less than proportionate changes in amounts consumed with the appellation of a "fundamental psychological law" he must have had in mind the diminishing utility of increasing amounts consumed. Only with the principle of diminishing utility in mind would it make sense to call the disproportionate relation of income and consumption (and savings) a fundamental *psychological* law (1).

Similarly, the multiplier and the acceleration principle are not free from assumptions of a mechanistic behaviour pattern. This is particularly clear in the usual formulation of the multiplier which measures the effect of an increase of investment, either private or public, on national income by assuming stable relations between income changes and the rate of consumption (or savings). In this way, i.e. by assuming a stable marginal propensity to consume over time it is possible to describe the multiplier (i.e. the number by which the original change in investment must be multiplied in order to arrive at the resulting change of income after the recipients of the additional income have had time to spend it in the proportion indicated by the marginal propensity to consume) as the reciprocal of the proportion of total income saved. Whatever help such

(1) J. M. KEYNES, *op. cit.*, p. 96. This is not to suggest that Keynes did not possess a keen psychological insight or that the consumption function is not one of Keynes' outstanding contributions to the new economics usually associated with his name. On the contrary, Keynes' understanding of human behaviour is far superior to that of the older school—particularly when it comes to the interpretation of entrepreneurial and investment decisions. Similarly, the consumption function which constitutes an essential part of his entire theoretical framework presents a step in advance over previous levels of understanding, because it locates the determining factors of behaviour in (objective) social and sociological aggregates rather than in exclusively introspective (subjective) calculations.

definition and conception may render in the interpretation of the repercussions of changes of investment, they reflect a belief in an essential uniformity and predictability of human behaviour which is looked upon as being determined and determinable by essentially *one* factor: income. No wonder, therefore, that forecasts based upon models built upon the simple multiplier concept have so far had a tendency to be widely off the mark and that recently several variants of the original multiplier have appeared which, because of their extreme complexity, have remained not amenable to operational definitions and even less so to empirical verification (1).

The so-called acceleration principle is another case in point. This principle describes the effects of changes of the demand for the products in one stage of production on the demand for products in the preceeding stage. In the gradual development and refinement of the acceleration principle entrepreneurial investment decisions seem to have assumed the character of purely mechanical and automatic reactions. Thus, assuming constant ratios between the output of consumers' goods and the amount of capital goods required and by further assuming that capital replacement expenditures vary proportionately with the extent to which they turn out finished goods, it can be demonstrated that a 10% increase in the demand for consumers' goods forces the entrepreneur to make outlays for new capital equipment which, if added to constant replacement needs, may amount to a 100% increase in total (i.e. gross) investments. In short, a relationship which is essentially indeterminate is made precise and determinate by an imputation of precise ratios between output of consumers' goods and by the elimination from the discussion of any of the psychological determinants of entrepreneurial expectations which serve as links between different periods of time in any real situation. Any precision in the formulation of the acceleration principle can be gained only at the price of neglecting the fact that investment decisions at any given time are never determined solely by the demand for consumers' goods. The decision to invest is dependent at any given time upon the

(1) Among the many variants of the multiplier are the "direct period multiplier," the "over-all timeless multiplier" and the "over-all period multiplier" and especially the various concepts of changing multipliers operating with variations in the marginal propensity to consume over time and space. For a brief review of these variants of the multiplier see HAROLD M. SOMERS, *Public Finance and National Income* (Philadelphia, the Blakiston Company, 1949), pp. 49–60.

interpretation which the demand situation receives from the investor in the light of the total business and political situation as well as upon a host of other factors such as technological changes and cost factors, the degree of utilization of existing equipment in both consumers and capital goods industries. In short, any precision in the formulation of the relation of changes in the demand for consumers' goods and changes in the demand for capital goods can be achieved only by neglecting psychological determinants of expectations and by imputing causal potency to one factor in a situation in which the outcome is in reality the result of the interaction of several competing factors (1). As in the case of the consumption function and the multiplier, the neglect of the psychological determinants in the decision to invest goes hand in hand with a concept of social causation which views the sequence of events not within the context of the total situation but as the dependable and necessary effect of one factor.

This then appears to be the essential dilemma of economic science. While all economic reality is a complex configuration of circumstances each of which can be regarded in isolation from the others only at the price of falsifying their unique inter-relationship, it is necessary for the purposes of theoretical analysis to select and to simplify, that is to say to break up reality and focus attention on some of its elements. Such a procedure, as Alfred Marshall once pointed out, may give results "which even as they stand, are roughly applicable to certain *special* (italics added) cases. But this does not justify us in speaking, in general, of one element as determined by another ... It is difficult to remember a prominent Ricardian writer who has not attained brevity at the expense of accuracy by employing the former of these expressions (2)." Indeed, the danger of the Ricardian tradition which, as the foregoing survey has tried to show is still with us, lies precisely in an undue oversimplification of the economic process which may give rise to determinate and precise but false theoretical conclusions. No wonder, therefore, that the theoretical models of economics have remained too far removed from the real world to per-

(1) A recent attempt to incorporate the qualifications which must be advanced against any rigid formulation of the accelerator into the theory itself turns out, on examination, to be merely a restatement of the qualifications and the admission that a precise formulation of the principle under realistic conditions is out of the question. HAROLD M. SOMERS, *op. cit.*, ch. 5.

(2) ALFRED MARSHALL, "Philosophy and Physical Science," *The Academy*, April 1, 1872, p. 131.

mit the transition from the former to the latter and that forecasts based upon such models go wrong.

Thus, the reconsideration of the psychological assumptions of economic theory raises some of the most fundamental methodological issues of economic science. Indeed, it emphasizes the need for a thorough reconsideration of the concept of causation in economics and of the problem of methods in general. It lends support to the suspicion that although simplified structures of the type employed by static mechanical economic theory may provide mental training for the beginner, they are able to condition his mind in such a fashion as to make him thoroughly incapable of ever viewing economic reality in its full dynamic complexity. In fact, our analysis of the inadequacy of the psychological assumptions of economic theory raises doubts about the whole assumption of a basic continuity between economic statics and economic dynamics according to which the transition from the former to the latter can be made by the gradual introduction of more and more variables. However, this is not the place to elaborate upon these methodological questions.

III

The central issue of this paper calls for an answer to the question of what are the alternative psychological premises which could replace the economic calculus and bring economic analysis more in line with the insights of modern psychological research. From the very outset let it be said that modern psychology does not present us with a ready-made and generally agreed formula concerning human action. In this respect the situation today is not better than it was several decades ago when individual economists began to look in vain for a more adequate psychological foundation for economic analysis. However, despite a perplexing variety of theories and methods in modern psychology it is possible to discern a number of developments which are of immediate relevance for economic analysis. Perhaps the most important of these developments is the abandonment of the rationalistic psychology and the realization that human behaviour can be explained and "predicted" only if we are willing to conceive of the individual as part of a larger whole (a group, an economic constellation, a culture) in which he operates and acts and to which he responds. The attempt to isolate the individual from the situation-as-a-whole and to interpret his behaviour in terms of a single psychological mechanism along the lines of a theory of an exclusively conscious motiva-

tion (à la Bentham) or for that matter in terms of a concept of an unchanging and "universal" Libido (no matter how diverse its component parts and how complex its constitution may be assumed to be) can lead only to an oversimplified view of human behaviour. In fact, to do so is to commit the error not only of singling out one factor from a great many factors and attributing causal effectiveness to it, but also of disregarding completely the fact that man is essentially a social being deeply involved, at any given time, in social or more precisely interpersonal relations.

Indeed, as long as we take human ends as primarily directed toward a more or less "regular" pursuit of wealth, we can never hope to establish economic analysis on a truly empirical and realistic basis. Instead of assuming a given scale of individual and collective preferences it is necessary to concern ourselves with the study of the way in which private *and* group objectives and the resulting decisions actually come into existence. This requires above all the realization that all economic relations are interpersonal relations *par excellence*. In other words, all economic action takes place in a field of interpersonal relations and as such is also conditioned and motivated by important drives for security. As already mentioned, this pursuit of security has its source in the individual's desire to achieve an integration with the group and the culture of which he is a part and thus to gain the recognition and approbation of his fellow men. The relative strength of this drive for security and integration seems to vary with the feeling of anxiety and helplessness which man may experience to a greater or lesser degree, depending upon the character of his inter-personal relations and the culture in which he lives (1). Further elaborated and integrated into economic theory, these concepts may

(1) Polanyi seems to go even further in his thesis that economic interests are rarely paramount and that man's economy tends to be completely submerged in his social relationships: "The outstanding discovery of recent historical and anthropological research is that man's economy, as a rule, is submerged in his social relationships. He does not act so as to safeguard his individual interest in the possession of material goods; he acts so as to safeguard his social standing, his social claims, his social assets. He values material goods only in so far 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 that process is geared to a number of social interests which eventually ensure that the required step be taken. These interests will be very different in a small hunting of fishing community from those in a vast despotic society, but in either case the economic system will be run on non-economic motives." KARL POLANYI, *The Great Transformation* (New York: Rinehart and Company, 1944), p. 46.

serve as a point of departure for a new approach to the study of human action in economic life.

In so far as contemporary economic analysis finds the causes of individual behaviour (such as the pattern of spending and saving) in social aggregates (such as levels of income), it is on the right track. The most significant chain of social causation runs indeed from the aggregates to the individual and not from the individual to the social aggregates. This insight, which is the basis of the new macro-economic analysis and which had been temporarily lost under the influence of the subjectivism of neo-classical value theories, must not be abandoned again. What is needed rather is to free the current macro-economic approach from its unduly simplifying and mechanistic assumptions which it has inherited from an earlier phase of the evolution of the social sciences. More than this we must view the consumer's behaviour as being determined by the whole constellation of the social situation in which he finds himself at any given time. That is to say, instead of taking the consumer's preferences and desires as given, the economist must study the manner in which such preferences are shaped by the total economic and social environment. More specifically, we need generalizations concerning consumer's behaviour particularly with regard to their spending pattern, which takes into account the effect on consumption of such factors as compulsive drives for higher standards of consumption, accumulated savings, changes of income in the past, expectations of future prices and anticipations as regards future changes of personal income. Fortunately, techniques for such factual investigations into consumers' spending patterns are being developed in various quarters (1) and it is reasonable to expect that we are well on the way to the formulation of a truly "empirical" theory of consumption and saving based upon actual field studies instead of upon *a priori* pseudo-psychological premises.

As far as the determinants of entrepreneurial action are concerned, a new point of departure for new generalizations may be found in the results of recent empirical studies of pricing and cost behaviour in private

(1) F. S. DUESENBERRY, *op. cit.*, and GEORGE KATONA, "Effect of Income Changes on the Rate of Saving," *Review of Economic Studies*, XXXI, No. 2, May 1949, pp. 95–103; A. CAMPBELL and G. KATONA, "A National Survey of Wartime Savings," *Public Opinion Quarterly*, Fall 1946, pp. 373–381; C. WINSTON and M. A. SMITH, "Income Sensitivity of Consumption Expenditures," *Survey of Current Business*, January 1950, pp. 17–20.

and state enterprise. Moreover, we need psychological premises which do not ignore the fact that entrepreneurial action, particularly the decision to invest, is a highly complex one which is neither automatic nor clearly dependable in the sense that it can be explained with reference to any single factor such as the level of the interest rate or changes in the demand for finished goods. What is required is an understanding of the way in which those spontaneous waves of optimism and urges to action, to which Keynes referred, come into being, how they are sustained and finally, falter and break. This is doubtless a psychological problem of the first order to which we do not do full justice by reiterating what John Stuart Mill already knew, namely that it is not profits but expectations of profits which tend to be equalized in different occupations under competition (1) and which play a major role in entrepreneurial action. Expectations and the marginal efficiency of capital are essentially psychological determinants of entrepreneurial decisions which require explanation and must not be treated simply as data. We have as yet no theory of how expectations (and hence the marginal efficiency of capital) are formed and without such a theory we are unable to formulate an adequate theory of investment decisions. It may well be, as Lachmann pointed out, that expectations are essentially indeterminate and unpredictable because they depend ultimately upon responses to, and interpretations of events by the human mind which are themselves unpredictable and indeterminate. But even if this is the case, as it may well be, it does not follow that we must despair of the task of formulating a theory of investment decisions as long as we do not make mathematical precision the criterion and aim of our theory. We could still try "to understand *why* the acting and expecting individuals interpreted a set of facts in the way they actually did ... [Indeed] we need not deplore unduly the undeterminateness of expectations for it is *intelligibility* and not *determinateness* that social science should strive to achieve (2)." In short, the task is precisely to relate the decision to invest to those aspects of the economic, technological and political situation as a whole which have proved in the past to have been of strategic importance for the development of optimistic expectations by the investor. Here too the roots of behaviour seem to lie in a field of inter-personal rela-

(1) JOHN STUART MILL, *Principles of Political Economy* (London, Longmans, Green and Company, 1904), p. 274.

(2) L. M. LACHMANN, "The Role of Expectations in Economics as a Social Science," *Economica*, X, No. 37, February 1943, p. 14.

tions which can be understood only in terms of a psychological mechanism which does full justice to the complex and conflicting motives of entrepreneurial behaviour and which is neither static nor regular but dynamic and discontinuous.

This applies also to the analysis of the behaviour of such important groups in contemporary society as labor unions, employers' associations and the organizations of farmers. It is becoming increasingly clear that these groups are responsible for some of the most important economic decisions concerning factor-costs and product-prices and thereby establish conditions essential for the performance of the economy. Obviously, it is the behaviour of these groups which must be studied if we are to understand and interpret economic life. And yet, as a result of its one-sided preoccupation with rational individual behaviour modern economics has almost nothing to say about the behaviour of these groups. We do not even have a very clear notion of what these groups are and of the functions they perform in society. We often fail to see that labor unions and farm groups owe their existence and their growth to the fact that they seem to meet sucessfully the basic need for security and integration of their members. In an otherwise atomistic culture these groups are able to command the loyalty of their members because they integrate the individual into a larger unit. In addition, of course, they fulfill their original purpose, namely to strengthen the bargaining power of the group and thus of the individual. As such these group organizations are indeed "an inevitable and necessary protection for the common man: his alternative to serfdom" (1). However, just as combinations of employers, associations of workers and farmers can also be used for the monopolistic purposes of exploiting and plundering the consumer. This combination of protective and exploitative aims which probably underlies all organized group behaviour must be taken into account in any realistic analysis of group action in economic life.

Take for instance the behaviour of labor unions and their participation in the establishment of wage rates and labor conditions in modern industry. It is not difficult to see that decisions of labor unions and employers are taken in a field of inter-personal power relations in which the pursuit of security (in all its manifestations) is interrelated in a complicated manner with the pursuit of satisfaction such as the desire for higher wages. Such non-wage objectives as the desire to maintain and expand

(1) J. M. CLARK, *Alternative to Serfdom* (New York: A. Knopf, 1948), p. 122.

the size of the union relative to employers and to rival unions, the need of the union leadership to maintain its power against that of rival cliques, as well as political aims, do not merely represent in a vague manner parts of the economic and cultural environment in which the struggle for a larger share of the national product takes place, but belong to the specific determinants of union behaviour at any given time. To single out wage objectives as the determinant of union action is to fall into the trap of the traditional concept of social causation. The avoidance of this trap calls once more for the use of a system of psychology which endeavors to understand man and his action in relation to the total constellation of which he or his group is a part.

From the discussion of the psychological determinants of union behaviour we turn to the determinants of political behaviour in general. The increasing importance of public budgeting and fiscal policy, the persistent growth of the scope of the public economy (whether measured in terms of the relative number of people employed, or relative amounts of income originating in the public sector or the proportion of public expenditure to gross national product or expenditure) makes it increasingly necessary to place the study of the making of collective decisions in the center of economic discussions. Indeed, the time may come when the study of political economy will again have to start with the study of the public economy and the decisions that give it scope, direction and purpose.

The question to be answered in this connection is simply how are collective decisions arrived at or what are the determinants of the decision-making process in government. How far do our traditional psychological assumptions help us to throw light (if any) on the manner in which collective, i.e. governmental choices in economic matters are formulated?

One answer to questions of this sort is, of course, that the determinants of collective decisions are not "psychological"; that such decisions take the forms of laws and decrees which, although usually arrived at according to certain rules of the "political game," are the outcome of a complicated struggle and compromise between conflicting interests. While it is admitted that psychological factors play a role in these struggles, it is held that the process of decision-making does not itself lend itself to an analysis and interpretation in strictly psychological terms. Moreover, it may be argued that the business of economics is to analyze the repercussions of collective decisions and that there is no need to go behind the decision

itself. In other words, it is possible to take the position that just as we take the consumer's scale of preferences for granted, we must accept the outcome of the decision-making process (the law, the decision of the Executive) as the point of departure for our analyses.

However, several considerations speak against these arguments. In the first place, as we have endeavored to show, economists must concern themselves with the genesis of individual preferences, if their conclusions are to possess empirical and predictive value. It would appear that this conclusion applies with equal force to the analysis of collective decisions. For without an understanding of the nature and genesis of collective decisions, economics can deal with the problem of collective choices only in a purely formal manner. That is to say our conclusions may define the optimum size of public investments in precise terms (e.g. as the point where the marginal social returns of all expenditures are equal and the marginal disutility of taxes is the same for every taxed group (1), but without enabling us to define either of these concepts in realistic and operational terms.

Second, a better understanding of the process of government as a process of decision-making would also enable economists to see economic problems in a more realistic light. Indeed, by viewing economic problems in the context of the political situation we would increase our understanding of the forces that shape the formation of present and future economic policies.

Within the context of this article it is neither possible nor desirable to launch upon an exhaustive analysis of the character and genesis of political decisions. All that can be undertaken here is to sketch the general nature of collective decisions as well as some of the circumstances under which they are arrived at. Obviously, the general nature of collective decisions can be understood only in terms of a concept of the nature of politics. Indeed, upon our conception of politics depends our thinking in these matters. The greatest danger derives from the fact that, impressed by the conscious effort involved in any governmental decision and misled by our desire for "good" government, we are inclined to overestimate the role of reason and to underestimate the importance of non-rational determinants of political processes and decisions. While the political process

(1) See e.g. ARTHUR SMITHIES, "Federal Budgeting and Fiscal Policy" in *A Survey of Contemporary Economics* (ed. Howard Ellis) (Philadelphia, The Blakiston Company, 1948), p. 193.

can be said to be one in which social needs (individual or group needs) are translated into social action (public policy) (1) and while such action consists in the making of decisions, the entire political process is shaped by the struggle for power of the various groups which make up society. Indeed, which particular goals and objectives will be singled out for satisfaction and the whole determination of how far the satisfaction of social needs should be carried, is not so much a matter of reason and intellect, but reflects rather the existing distribution of power between different individuals and groups at any given time. Thus, what made the demand for progressive taxation ineffective during the 19th century and effective now is precisely the fact that the extension of democratic universal suffrage has made it possible for large masses of people who did not possess such power formerly to make their wishes and power (i.e. their votes) felt. In short, what is recognized and satisfied as a collective need depends not so much upon what may "reasonably" be regarded as being in the general interest, but is a matter of adjustment and compromise between conflicting interests. As a result, the whole process of government decision-making is usually accompanied by the use of such instruments of power as intimidation, bluff, persuasion, coercion and economic pressure, and the outcome may appear to be far removed from anything that may be called "reasonable." In short, the social needs actually translated into legislation and policy may be those of dominant groups which can muster a majority of votes and may bear no or only a remote relation to the national interest, however defined (2).

This may suffice to show that any attempt to interpret the decision-making process of the government in purely formal terms or in terms of a rationalistic mechanism which fails to take into account the complex na-

(1) H. LASKI, *Politics* (J. B. Lippincott, 1931) (quoted from R. C. Snyder and H. H. WILSON, *Roots of Political Behavior* (New York: The American Book Company, 1949), p. 89.

(2) Of course, the problem of a conflict between the majority vote and the national interest does not arise if one identifies the two *per definitionem*. In practice, such identification can only give rise to an uncritical subservience of political analysis to political power. For this reason we prefer to uphold the traditional view that the majority decision and the general interest of the community do not coincide automatically. In fact, it appears reasonable to say with Laski that the relation between the general interest of the community and the legal imperatives of the state will be the more profound the more equally economic power is distributed in society. See H. LASKI, *op.cit.*, pp. 87 ff.

ture or the determinants of political decisions is bound to stop short of a realistic interpretation of the process of planning and public policy formulation.

Perhaps two generally acceptable negative conclusions have emerged from the foregoing analysis: First, the assumption of rational economic conduct provides no tenable hypothesis for the analysis of the behaviour of such heterogeneous groups as consumers, entrepreneurs, investors, labor unions and government. Second, no single alternative psychological premise is as yet in sight which would provide an adequate framework for the analysis of the determinants of the great variety of decisions which together shape the economic process.

What our discipline needs are new psychological premises which, instead of viewing man in isolation and possessed of immutable instincts and simple propensities, represent generalizations from observed behaviour patterns of men or groups of men engaged in making active decisions and choices. We need carefully tested regularities of human behaviour which, because they have been derived empirically, are subject, at any given time, to further empirical verification.

Only by examining and observing the actual behaviour of individuals and of large bodies of men under the most divers circumstances in the past and the present, indeed only by the most comprehensive and laborious appeal to experience and by not quitting too soon "the duty of dwelling long and humbly among things" (1) can we hope to extract from the empirical data the principles and regularities upon which depends the further progress of knowledge in our discipline. "Then [indeed] we could be sure that most of what we knew would continue to be true, no matter how breath-takingly original the ideas advanced in the next numbers of journals, no matter how disconcerting the replies of several dozen entrepreneurs to a questionnaire (2)." Of course, this is not to say that all that is required is the patient collection of data. The mere accumulation of results from one sample after the other obviously is *not* sufficient. We cannot dispense in our empirical researches with preliminary hypotheses enabling us to raise the relevant questions and to select and arrange the relevant material. The elaboration of such a body of hypotheses requires

(1) RICHARD JONES, *An Essay on the Distribution of Wealth, and on the Sources of Taxation* (London, John Murray, 1844), p. XXII.

(2) GEORGE J. STIGLER, "A Survey of Contemporary Economics," *The Journal of Political Economy*, LVII, April 1949, p. 104.

above all that we scrutinize that body of psychological theory which views human behaviour from the very outset as social behaviour in the sense of behaviour conditioned by the whole pattern of social institutions and inter-personal relations in which the pursuit of satisfaction and the pursuit of security determine the making of both individual and group decisions. Ultimately progress in this as in other fields of the social sciences depends upon a combination of empirical research with theoretical speculation. Just as in other fields of social research, methods depend upon the problem to be investigated. If it should turn out that the study of human behaviour does not lend itself to quantitative analysis and precise generalizations, let us abandon the sterile imitation of the "scientific" approach and develop new methods appropriate to the character of the problem under discussion.

CHAPTER 3

APPROACHES TO THE INTEGRATION OF SOCIAL INQUIRY: A CRITICAL EVALUATION

SUMMARY

While the integration of social inquiry and social knowledge is considered necessary and desirable as well as possible, as shown in the concluding part of the article, the emphasis is on the demonstration of what are believed to be serious shortcomings in current efforts aiming at an intellectual integration of the social sciences. Five major approaches toward an intellectual integration are studied: (1) Interdepartmentalism, (2) Historiography, (3) Reasoning by analogy to the physical and biological sciences, (4) Positivism and Logical empiricism and (5) Dialectical Materialism.

Interdepartmentalism and interdisciplinary cooperation may contribute to a greater awareness of common problems but frequently fail to secure a common focus and a common point of view from which the problems are studied. Historiography as a vehicle of intellectual snythesis suffers from the fact that it has clung more than the other social sciences to a phenomenological approach; that it has rarely shown an interest in checking its assumptions as to human nature, if indeed it made use of any such assumption; and that it seems to operate without a technical vocabulary of clearly defined concepts.

The usefulness of reasoning by analogy to the physical and biological sciences as a method of integrating the social sciences is limited by the fact that the apparent similarities between subject-matters of the different disciplines always turn out upon closer investigation to be less complete and less perfect than was originally assumed and that in the end the analogy may open the way to a pernicious falsification of the materials studied and the perception of the social scientist. Positivism and logical empiricism have made significant contributions to the exploration of the unity of scientific inquiry. However, their dogmatic suspicion of the *a-priori* or theoretical component of our knowledge would confine any unification of social inquiry either in terms of a common language and method or in terms of a so-called encyclopedic integration to only one part of our knowledge.

While dialectical materialism offers an integrated interpretation of reality its usefulness is seriously limited by (1) the fact that it is not based upon an empirically verified knowledge concerning the nature of man and of the nature of socio-cultural processes and (2) the false imputation of a high degree of determinism and predictability which the logic of the dialectics invites and which is itself a product of our tendency in the West to think in terms of dichotomies and to impute a dualistic character to historical processes.

The author looks toward a positive solution of the problem of the integration of social knowledge in terms of two broad conceptual frameworks of man and culture which he insists must take full account of the unique characteristics of socio-cultural phenomena and events conceived as processes pertaining to a special level of organization or systems to be distinguished from living organism and inanimate matter.

Nothing shows more dramatically the nature of the intellectual crisis of our time than the progressive disintegration of the lines of communication between the various disciplines. Even within some of the broader fields of inquiry the degree of specialization has often been pushed to a point where an exchange of ideas is becoming more and more difficult if not impossible. When in the end the nuclear physicists are understood only by nuclear physicists and econometricians can speak only to econometricians one wonders indeed whether scientific inquiry "will not grind to a stop in an assemblage of walled-in hermits each mumbling to himself words in a private language that only he can understand"[1].

The growing disintegration of knowledge in general and of social inquiry in particular has given rise to various demands for an intellectual integration of our knowledge. In fact integration of social inquiry seems to have become a general desideratum which finds expression in all kinds of *ad hoc* interdisciplinary research and intellectual ventures including the introduction of integrated social science courses into the curriculum of colleges and universities.

The main purpose of the present article is to evaluate critically some of the current efforts made in favor of a greater integration of social inquiry. In this endeavor we are not motivated by any negative attitude toward the aim of integration of social inquiry. However, we feel that some of the current attempts at integration suffer from inadequacies and may expose us to dangers which, if not made explicit in time, may seriously discredit the whole movement toward establishing closer contact between the various specialized disciplines. To point out these limitations and dangers may serve as

1. K. Boulding, "General System Theory—The Skeleton of Science", *General Systems*, Yearbook of the Society for the Advancement of General Systems Theory. Mental Health Research Institute, University of Michigan, Ann Arbor 1956, Vol. 1, p. 12.

a first step toward a positive approach to the solution of this important problem.

Five major approaches will be studied critically in the following pages. They are listed here for the convenience of the reader without any claim that the list represents either a complete or a fully satisfactory classification: (1) Integration by interdepartmentalism; (2) Integration by historiography; (3) Integration through the use of analogies; (4) Logical empiricism and the unity of science movement; (5) Dialectical materialism and the integration of knowledge.

In *Totem and Tabu* Freud speaks of three basic "world views" all of which make it possible to comprehend the totality of the world from one point as a continuity: Animism, Religion and Science. Of these three the animistic or mythological world view "is perhaps the most consistent and the most exhaustive, and the one which explains the nature of the world in its entirety"[2]. The fact that the human mind has always found it easy and desirable to provide an integrated interpretation of the totality of man's experiences in terms of an over-all *a priori* system of thought must serve as a warning against any attempt to relate our departmentalized knowledge in terms of a unifying world view—be it animistic, religious or secular in character. The fact that such integrating world views are available and can be developed with great ease by the speculative mind provides a constant temptation for a premature unification of our inquiries and our various spheres of knowledge. The great drawbacks of these attempts to find a solution of the dilemma of intellectual compartmentalization in terms of a basic world view is precisely their highly intuitive and largely unverified character. It is true scientific analysis may always have to be motivated by some unified world view. However, unless such a world view is tentative and open the dangers of any integration by means of a united and uniting world view, of "a deeper dimension of thought"[3] lie in the fact that they may lead to an imputation of unity and continuity of experience which will not stand up under closer investigation in

2. S. FREUD, "Totem and Taboo", in *The Basic Writings of Sigmund Freud*, The Modern Library, New York 1938, p. 867.

3. R. ULICH, "On the Rise and Decline of Higher Education", in *Goals for American Education*, Conference on Science, Philosophy and Religion, Harper and Bros., New York 1950, p. 13.

the light of our evolving total knowledge of man and the universe. If there is one thing we have to guard against it is the temptation to interpret the world in terms of uniform and unifying principles which may be simple and comforting but without confirmation and verification. For the result of such unification in terms of vague and unverified propositions and general world views is often the imposition of integration "from the outside" and a rationalization of the preconceived unity into dogma. Nothing could be more harmful for the advancement of social knowledge than the degeneration of the movement toward integration of social inquiry into a dogmatically held and self-sealing system of knowledge capable of discounting the evidence which tends to refute its validity.

1. Integration by Interdepartmentalism

Among the many proposals advanced for the integration of social inquiry none seems to enjoy greater popularity, at the present time, than the suggestion that particular problems be investigated by a group of specialists from different disciplines. This idea of interdisciplinary research which doubtless reflects a growing awareness of common problems has given rise to a variety of interdepartmental devices such as interdepartmental seminars and courses in colleges and universities, and the conduct of research by committees composed of specialists from different disciplines; it has led to various forms of teamwork in field studies dealing with primitive cultures and the analysis of foreign areas.

Of course, individual social scientists have long been aware of the fact that their specialized findings can not be directly "applied" to the solution of practical problems. In one form or another these specialists have argued in favor of coordinating their theoretical findings with those of the related disciplines. The whole ideal of a "positive" science of economics for example was based upon the realization that the actual conduct of affairs could neither solely nor even primarily be based upon the general principle of a formal science of economizing. (Nassau Senior, John St. Mill, P. H. Wicksteed, V. Pareto, and J. M. Keynes were all explicit on this point and called for the supplementation of the results of pure economic analysis by the findings of the other social sciences.) And yet it was

not the insights of these early believers in a positive science of pure economics which gave rise to the present vogue of interdisciplinary research and teaching projects, but rather the manifest inadequacy and lack of relevance of many theoretical conclusions for the solution of the practical problems of our time.

What are the relative merits and weaknesses of these interdepartmental endeavors as a means of achieving the integration of social inquiry?

The great merit of most interdisciplinary research and teaching is the continuous stimulation of a general awareness of the interdependency and interrelationship between social phenomena and of the inadequacy of theoretical conclusions which view the problem under discussion from the perspective of one discipline. Interdisciplinary research also tends to cultivate in each participant a greater familiarity with the concepts and methodological procedures of other social sciences. In this way interdepartmental cooperation may yield important insights into the difficulties and obstacles which stand in the way of an effective integration. By showing for example that different disciplines use entirely different concepts and methods in their respective approaches to their problems, the interdisciplinary research project may actually lead to the realization that no connection can be established between the respective fields of inquiry.

All this may be beneficial in the long run. And yet interdepartmental cooperation obviously falls short of what is required for a genuine integration of different disciplines. Harmonious teamwork or general awareness of common problems and of obstacles to effective coordination are at best substitutes for an integration of social inquiry which must sooner or later be established within the mind of the individual scholar. In order to achieve this it is not sufficient merely to deal with common problems or to study a common geographical area; what is required is a common focus or point of view from which the problems of the area are studied. Only a common conceptual framework which permits the investigators to cut across departmental lines can achieve this. Neither awareness of common problems nor the accumulation of knowledge from various related disciplines is the objective of integration but rather the establishment of relationships between different parts of our social knowledge which can be meaningfully and systematically related. Interdisci-

plinary research may offer "the most encouraging prospects both for the development of the social sciences and for the progress of historical study" as the authors of the Report on *The Social Sciences in Historical Study* believed[4]; but the fact remains that shared work on a common task is not integration and may indeed go hand in hand with the uncritical accumulation of data, hypotheses and theories which are neither systematically tested nor consistently interrelated.

Certainly the cooperation of representatives from different disciplines is no guarantee that their conclusions will be integrated in character. What T. S. Eliot[5] described as the assembling into committees of "representatives of different types of knowledge and experience, of calling in everybody to advise everybody else" and what Schlesinger[6] regards as "the fetish of interdisciplinary projects" and "the bureaucratization of American intellectual life" offer no assurance that the experts trained in a particular speciality will realize the broader context and the unitary character of the particular problem under discussion.

2. Integration by Historiography

From time to time historians have claimed that their discipline is particularly well suited to provide an effective synthesis of the subject-matters of different fields. This point of view finds expression in the belief that since historiography does not aim at generalizations but intends to provide the reader with a comprehensive narrative of the past in the light of contemporary thought, the writing of history has necessarily to take account of a much greater number of factors than any other social discipline. Historiography in this sense may be regarded as a kind of descriptive integration. Indeed, historians in their endeavor to make their narrative of the social, political, intellectual and general cultural development of a geo-

4. *The Social Sciences in Historical Study*. Report of the Committee on Historiography, Social Science Research Council, Bulletin No. 64, New York 1954, p. 32.

5. T. S. ELIOT, *Notes Towards the Definition of Culture*, Harcourt, Brace & Co., New York 1948, p. 86.

6. A. SCHLESINGER jr., "The Statistical Soldier", *Partisan Review*, Aug. 1949, No. 8, p. 853.

graphic area or a particular period as comprehensive as possible have sometimes aimed at writing "total history" or "histoire impérialiste" as the French historian F. Braudel[7] described his attempt to integrate geography, sociology and ethnography. These hopes and ambitions to use the writings of history as a kind of interpretative synthesis are shared by other historians[8].

It is true, of course, that historiography more perhaps than any other social discipline has maintained an awareness of the multitude of factors whose interaction gives the historical process its multidimensional character. Reluctance to generalize and the desire to provide a comprehensive narrative seem to have protected historiography against some of the dangers of narrowly specialized inquiries. Not being preoccupied with and impressed by particular methodologies the historian has usually not permitted the method to determine the character of the problem to be investigated. Indeed "history has dared to seek the answers to questions which other disciplines would have declined for the lack of an adequate method. History has never held itself aloof from life or guarded its own purity by confining itself to topics for which it possessed a fully tested methodological and conceptual apparatus of attack. It has never permitted the tyranny of method to dictate the subjects which it would investigate and has never shifted its attention from men to mice because of the seductive fact that mice lend themselves to precise investigation more readily than do men. It has also been the glory of history that its professional devotees have never entirely lost communication with the intelligent layman, as the practitioners of the social sciences have almost universally done"[9]. All this is readily admitted as will be the fact that the central preoccupation of the historian has always been with the phenomena of change and development in social affairs.

7. F. Braudel, *La Méditerranée et le monde méditerranéen à l'époque de Philippe II*, Armand Colin, Paris 1949.

8. See, e.g., R.F. Arragon, "Techniques and Place of History in General Education", *Journal of General Education*, IV (1949/50), p. 184; C.J.H. Hayes, *A Political and Cultural History of Modern Europe*, Macmillan, New York 1932; W. St. Holt, "History and the Social Sciences Reconsidered", *Kyklos*, VIII (1955), p. 389 ff.

9. D.M. Potter, *People of Plenty, Economic Abundance and the American Character*, University of Chicago Press, Chicago 1954, p. XV.

And yet, little reflection is required to show that historiography must suffer from serious shortcomings as an integrator of social inquiry. These limitations are inherent in the merits which historians have claimed for their approach. In the first place, the tendency to consider the uniqueness of events, and to give a comprehensive narrative without much concern for their regularities has made it possible for the historian to approach his material much too directly. Whereas the physical sciences have found it more and more unreliable to consider the commonsense experiences as data and evidence and have proceeded to "dissolve away the appearance of phenomena"[10] historiography has clung largely to a phenomenal approach. What is more, the data to which historiography clings seem to be largely those of the documentary record. Also historians seem to have found it unnecessary to go beyond commonsense notions of human nature and human behavior. Like many other social scientists they have often failed to see that the value and validity of all inquiries into the affairs of man and society depends to a large extent upon the investigator's theory of man[11].

There are other shortcomings which make it more than doubtful whether historiography can ever fulfill the promise of achieving an effective integration of social inquiry even though it may deal with every aspect of the social process. There is first the absence of a technical vocabulary. Whereas all other professional studies have found it necessary to develop clearly-defined concepts and conceptual frameworks, "history is the one field of professional study that knows no professional or technical vocabulary"[12]. This lack of a professional vocabulary together with an almost boundless interest in every conceivable aspect of the fortunes and events of individuals and groups may give the writing of history its popular appeal and its aesthetically satisfying component but it makes it impossible for the historian to act as an effective integrator for the highly specialized

10. A. L. KROEBER, "Integration of the Knowledge of Man", in *The Unity of Knowledge* (Lewis Leary, ed.), Doubleday, New York 1955, p. 133.

11. "Although history has constantly made all sorts of assumptions about the nature of man, it has never possessed any systematic method for checking these assumptions. In a sense, this is equivalent to saying that historical method has not included any means for analysis of the chief factor with which history deals". (POTTER, *op. cit.*, p. XIX.)

12. KROEBER, *op. cit.*, p. 138.

knowledge which the various social disciplines have formulated in specialized vocabularies and conceptualizations[13].

Furthermore, historians seem to be constantly called upon by their subject-matter to deal with the "causes" of particular events and the structure of particular societies. And yet historians have rarely found it necessary to concern themselves with the general problem of social causation and the structure and functioning of society. While they interpret their data historians seem to attempt no generalization and rarely produce theories "that would tie up (their subject-matter) with other intellectual activities"[14].

In so far as historiography is concerned with the narration and account of intellectual history in the sense of the evolution of different branches of knowledge within the general cultural context, it may make an original contribution to the understanding of an era by showing its specific integration (or lack of integration) of knowledge. In this instance the historian is likely to show the interrelationship of thought, objectives and action as well as the way in which new and more adequate modes of thinking in one field of intellectual endeavor may influence the rest of the intellectual enterprise. As a result of such a broad historical treatment of the evolution of thought and ideals within the context of the social, political and economic framework of the past, the foundation is laid for an awareness of how an intellectual unity may be gained and lost[15]. And yet, while the preoccupation with the history of thought may contribute to an awareness of the rise and decline of integrated knowledge in the past, it obviously stops short of providing an integration of knowledge.

13. On this point see also F. S. C. NORTHROP, "The Problem of Integrating Knowledge and the Methods for its Solution", in *The Nature of Concepts and their Inter-Relation and Role in Social Structure*, Proceedings, The Stillwater Conference, Oklahoma A+M College, Stillwater, Oklahoma, 1950, p. 28.

14. KROEBER, *op. cit.*, p. 138.

15. To have been guided by this broad aim of an intellectual history as reflected in original writings rather than to give the student a second-hand narrative of developments has been the characteristic of the Columbia College approach to general education as reflected in the two volumes entitled *Introduction to Contemporary Civilization in the West*, 1946 and 1947 (new edition 1955 and 1956).

3. Integration Through Use of Analogies

One of the oldest methods employed in establishing an apparently consistent and integrated picture of different fields of human experience, even in prehistoric and prescientific periods, is the use of analogies. Later, the development of more complex technological operations and the emergence of machines provided the basis for all kinds of mechanical analogies which have played a significant role during the formative stages of the social sciences. Following the success of Newtonian mechanics, mathematical and physical concepts and laws concerning the behavior of matter under the action of forces, dealing with cases where no motion is produced (statics) became the classical model of thought in virtually all other disciplines. Later, the classical concepts of organism and evolution provided the model for countless attempts to detect and impute resemblances between phenomena and experiences from the world of animate nature and human society. The increasing use of complicated electronic computers and feedback systems in contemporary life has led to numerous suggestions to interpret biological, social and mental phenomena which seem to be characterized by some kind of automatic maintenance of states of equilibrium and purpose, in analogy to the operation of computers and feedback mechanisms.

The problem that concerns us here is not the particular merit or defect of this or that particular metaphor that has served as the basis of analogies in the history of one or the other of the social disciplines. What interests us is rather the general usefulness of analogies as integrators of different fields of inquiry. There is no doubt that reasoning by analogy constitutes a highly effective method of integration. The whole history of Western thought bears testimony to this effect. Both the physical and the social sciences have made extensive use of analogies and the effect has been almost invariably to establish closer relations between different fields of inquiry by transferring the basic methods and modes of thinking from one discipline to another. Nor is it likely that reasoning by analogy can be avoided altogether if we consider that it is impossible to observe more than a few of the countless phenomena that require investigation. For this reason alone it is probably true to say that "reliance must in the last resort, be placed upon the belief that the relations which

we are debarred from observing are analogous to those in the field which is open to our perception"[16].

Indeed, the benefits derived from analogies may be substantial. Particularly during the formative stages of a new discipline, analogical comparisons and the exploration of likenesses are often the only procedure which makes it possible to deduce tentative conclusions in a new and as yet unexplored field. By assuming a resemblance to an already validated pattern of thought, concept or doctrine, the analogy may offer suggestions for new hypotheses; and new problems may become more comprehensible by the assertion of an analogy between the new and the familiar problem[17]. Moreover, since all investigators are affected by, and are more or less easily impressed by images and patterns of thought of other disciplines, especially when these have demonstrated their success by the conquest of new truth, analogical comparisons represent a constant temptation to the human mind. For these reasons the search for some kind of a master pattern of thought or a kind of primary concept as a common denominator of the greatest generality is likely to continue; and it can hardly be denied that the reduction of all doctrines, concepts and patterns of thought to those of a master pattern would indeed represent the most complete integration of man's total knowledge.

At the same time it must be clear that all reasoning by analogy carries with it serious dangers which have rarely been avoided even by those who, like Freud, knew that it is dangerous to drag concepts out of the field where they originated and apply them in another field[18]. In the first place, reasoning by analogy seems to make it possible to dispense with the need to formulate clear conceptions of the nature of the materials and subject-matters with which one is dealing. For implicit in the use of the analogy is the assumption of a fundamental similarity (if not actual identity or at least continuity) between the phenomena under discussion and those from which the

16. A. ARBER, "Analogy in the History of Science", in *Studies and Essays in the History of Science and Learning* (M.F.Ashley Montagu, ed.). Henry Schuman, New York 1947, p. 224.

17. See *idem*, p. 229/230.

18. S. FREUD, *Civilization and its Discontent*, Hogarth Press, London 1955, p. 141.

analogies are drawn. Once the intellectual operation based upon the analogy is in full swing, that is once the conceptual framework and the doctrine deduced is adopted, it is usually too late to remind oneself of the imperfect character of the original analogy upon which the whole enterprise rests. As a result it becomes possible to neglect and actually withdraw from investigation the very events and processes that are under discussion. Collection of data, documentation and verification become superfluous in proportion to the extent of the belief in the similarity and ultimate identification of what may be actually heterogeneous materials pertaining to qualitatively different levels of organizations. Indeed, evidence that pertains to one level of organization (let us say to inorganic matter, to organic life, or the psyche of the individual) can be used with relative ease and without explicit recognition of any shift, in connection with the study of human history, human society and cultural processes in general. Without ever proving the similarities and identities of the structure of different levels of organization (inorganic matter, living organism and human society) reasoning by analogy makes it nevertheless possible to explain one in terms of the other. The whole search for truth can thus be rerouted from a direct investigation of the level of organization under consideration to an indirect attack upon it by simply switching from one level to another and by imposing the analogy upon the material and by drawing the necessary inferences from it. In this way it comes to pass, as Rieff[19] has shown with particular reference to psychoanalysis, e.g. that the objective-cultural is reduced to the subjective-psychological; that the social is systematically explained as a secondary elaboration of private psychological experiences. In short, the cultural context and the causal potency and autonomy of the social process and of social evolution are if not ignored, dismissed and denied.

In the second place the selection of particular analogies is full of hidden normative and "political" elements as the history of economic analysis seems to indicate. That is to say, analogies frequently prove very convenient for what may be called the tendency to place one's conclusions into the premises and then proceed to the elaboration of the appropriate theories. Thus under the influence of me-

19. PH. RIEFF, "History, Psychoanalysis and the Social Sciences", *Ethics*, Vol. 63, January 1953.

chanical analogies, economic theory has continued to search for levels of equilibrium and has assumed human behavior to occur as an essentially timeless reaction to certain changes of data. In order to make this assumption plausible it was necessary to assume further that "economic" behavior (in so far as it was relevant for economic theory) took place under conditions of complete "transparency" or complete knowledge of the total situation. Despite the fact that these were simplifying assumptions (first approximations only) it has been exceedingly difficult for the theoretical economist to conceive of economic behavior as actual human responses taking place in a field of interacting factors marked by a high degree of uncertainty and capable of giving rise to all kinds of cumulative and contagious behavior movements. The mechanical analogy and the related assumption of rational human conduct as a timeless and quasi-automatic reaction to transparent changes of data has remained one of the major obstacles to viewing economic behavior in a less formal fashion than that represented by thinking in terms of mathematically formulated functions of single variables such as income and price.

To summarize, we may say that while analogies may facilitate the comprehension of something that is unfamiliar in terms of something that is familiar and as such may provide a measure of integration for social inquiry with the rest of man's knowledge, they provide no proof. Unless based upon the verified demonstration that the phenomena and subject-matter of different disciplines are continuous and homogeneous, inter-disciplinary integration by means of analogies is likely to oversimplify and misrepresent reality by falsely imputing similarities and likenesses to different phenomena which actually belong to different levels of organization marked by qualitatively different levels of complexity. The end-product may be a pernicious falsification of perception by virtue of the fact that the analogy permits generalizations not based upon a first-hand acquaintance of the nature of the phenomena under discussion.

Thus we are in essential agreement with the statement that analogies "so long as they are allowed to retain their genuine and intrinsic character, are of incalculable value; but the very essence of this character is *imperfection*... It is, indeed, their very imperfection which sets them in the boundary region of scientific thought, where they can act as connecting links with other worlds of experience...

To understand and use analogies aright, we must realize that they are in their nature artistic and creative rather than analytic and logical, and that their function is to illustrate, to suggest, and to illumine, rather than to prove"[20]. For this reason the use of analogies for the integration of social inquiry must be viewed with considerable suspicion and scepticism. The greater the complexity and qualitative differences between different subject-matters, the less room is there for the use of analogies. From which it follows, of course, that it is more dangerous to borrow habits of thought and basic concepts from subject-matters which differ in complexity than it would be to reason by analogy within the same general field of inquiry.

4. Positivism, Logical Empiricism and the Unity of Science

Because there are certain parallels between Comte's positivism, logical empiricism, and the related unity of science movement, we shall consider these approaches together.

Comte looked upon the compartmentalization of knowledge in his time as the inevitable outcome of intellectual specialization. Just as the division of labor in the production of goods and services and the resulting exchange give rise to conflicts and "individual divergences", specialization in human thought, while permitting a "felicitous development of the spirit of detail otherwise impossible ... spontaneously tends ... to snuff out the spirit of togetherness or, at least, to undermine it profoundly"[21]. Such specialized research particularly in the field of social inquiry was considered by Comte as basically irrational and defective in its method and "radically sterile" as far as its outcome was concerned. According to Comte political economy provided a particularly telling example of this situation. While Adam Smith never intended to found a new and separate science his immediate successors, far from building upon the work of the famous philosopher, embraced a dogma of scientific isolation and specialization which prevented any real and sustained scientific progress.

Comte denied that the economic aspects of wealth even though they may represent themselves in an exchange economy as purely

20. ARBER, *op. cit.*, p. 233.

21. A. COMTE, *The System of Positive Philosophy*, Bk. IV, quoted from E. DURKHEIM, *The Division of Labor in Society*, Free Press, Glencoe, Illinois, 1947, p. 357.

monetary phenomena can be detached from their philosophical, moral and intellectual aspects without vitiating the search for truth; "all the various general aspects of the subject are scientifically one, and rationally inseparable, so that they cannot be illustrated but by each other. Thus the economical or industrial analysis of society cannot be effected in the positive method, apart from its intellectual, moral and political analysis past and present"[22].

Instead of contemplating the elements of the social process separately as if they had an independent existence, the only correct way of studying society, according to Comte, is "to regard them (the elements) as in mutual relation, and forming a whole which compels us to treat them in combination..."[23]. This is not to say that there can be no subdivision in the study of society, but such subdivision can emerge only in the light of the requirements and methods of the science of society as a whole. Comte saw the solution in a deliberate effort designed to establish the logical relations between each of the separate disciplines; to show their continuity and if possible to discover a small number of principles to which all the principles in the various disciplines can be reduced. Indeed, in order to assure the ultimate unity of all science it would be enough to unify their logical and methodological procedures[24].

Similar to this conception the contemporary movement toward a unification of scientific language and method proposes to unify knowledge not in terms of any "metaphysical" construction outside or alongside the various special fields of knowledge but in terms of the "synthesizing glue" which the special sciences provide themselves[25].

22. A. COMTE, *op. cit.*, quoted from K. Wm. and L. L. KAPP, *History of Economic Thought—A Book of Readings*, Barnes and Noble, New York 1956.

23. *Ibid.*, p. 207.

24. DURKHEIM, *op. cit.*, p. 363. Within the context of the present discussion it is not necessary to show how the author of *The System of Positive Philosophy* finally succumbed to his personal metaphysics and permitted his "subjective synthesis" in terms of a new ethics of love and social feelings to pervert the positive philosophy into a new utopia of constraint and order organized in a positivistic church and a new "religion of humanity".

25. "Those who are active within this movement are emphatic in their insistence that instead of aiming at a synthesis of the different sciences on the basis of a prior and independent philosophy, the special sciences will themselves supply their own synthesizing glue. For appreciating the significance of this movement it is therefore necessary to keep in mind that its tendency is toward a *unified science*,

This so-called synthesizing glue is found in the logical connections between the terms and generalizations of the various disciplines. The unity of knowledge thus becomes a question of the logic of inquiry and the practical task of integration a matter of analyzing whether and how the terms and laws of different disciplines can be reduced and related to one another[26]. The ultimate aim is to adapt the scientific vocabulary and to formulate the generalizations of different disciplines in such a fashion as to be able to go from one discipline to the next without fundamentally changing the scientific language[27]. The appropriate model or program for such a unification of scientific language is not one systematic science but an encyclopedia[28].

There are several reasons which in our estimation raise doubts about this approach to the integration of social inquiry by discovering and establishing the logical relationship between the terms and generalizations of the various social disciplines. In the first place, there are the practical difficulties which confront the attempt of integrating knowledge by unifying language and methods. Scientific language and methods are integral parts of the disciplines that are to be unified. Scientific language is based upon a technical terminology; it can be understood only within a given context. Scientific language and methods are inseparable from the established generalizations of

departmentalized into special sciences, and not toward an artificial and speculative juxtaposition of an autonomous philosophy *and* an autonomous group of sciences". (O. NEURATH, "Unified Science and its Encyclopedia", *Philosophy of Science*, Vol. 4, April 1937, p. 265.)

26. "In any case when we ask whether there is a unity in science, we mean this as a question of logic, concerning the logical relationships between the terms and the laws of the various branches of science. Since it belongs to the logic of science, the question concerns scientists and logicians alike". (R. CARNAP, "Logical Foundations of the Unity of Science", *International Encyclopedia of Unified Science*, University of Chicago Press, Chicago 1938, Vol. 1, No. 1, p. 49.) "The question of the unity of science is now the question as to the unity of procedures, purposes and effects of the various sciences". (C. W. MORRIS, "Scientific Empiricism", *International Encyclopedia of Unified Science*, *op. cit.*, p. 70.)

27. Cp. NEURATH, *op. cit.*, p. 268–270.

28. "An encyclopedia and not a system is the genuine model of science as a whole. An encyclopedic integration of scientific statements, with all the discrepancies and difficulties which appear, is the maximum of integration which we can achieve". (O. NEURATH, "Unified Science as Encyclopedic Integration", *International Encyclopedia of Unified Science*, *op. cit.*, p. 20.)

the discipline. Both these facts make it exceedingly difficult, if not impossible, for anyone who does not work inside several or all scientific fields to master the task of unifying the languages and procedures of several fields. For as methods "are immanent in the very sciences, as it is impossible to disengage them completely from the body of established truth in order to codify them separately, we can know them only if we have practised them. But it is now impossible for the same man to practise a large number of sciences"[29].

There remains then only the unification of language and methods from the outside by way of an outside legislation for all sciences—a kind of scientific Esperanto imposed or introduced from above as it were. But such legislation could be neither comprehensive in the short-run, nor could it be effectively maintained in the long-run. Unification of knowledge by legislation of a unified framework of language and method could not possibly encompass those parts of our knowledge which do not fit into the framework. But what is more important, it could be maintained only by force and this would be self-defeating and inimical to the acquisition of new truths. Any attempt to approach the integration of social inquiry from the outside and by a super-positivistic framework of method and language—in short "by legislation"—would prove to be as futile and as ineffective in the short-run as any unification on the basis of a metaphysical super-science has proved in the long-run[30].

A second and even more fundamental weakness of the approach to the integration of social inquiry according to the suggestions of logical empiricism has to do with the dogmatic rejection of the so-called *a priori* or theoretical component of our knowledge. For it would appear that this rejection of the *a priori*, the so-called metaphysical components in our knowledge, would confine the encyclopedic integration of scientific statements to only one part of our knowledge. In fact the contemplated encyclopedia of scientific

29. DURKHEIM, *op. cit.*, p. 363.

30. For these reasons it seems that John Dewey said almost the last word on this approach when he wrote in the first volume of the *International Encyclopedia of Unified Science* "... the needed work of coordination cannot be done mechanically or from without.... The attempt to secure unity by defining the terms of all the sciences in terms of some one science is doomed in advance to defeat. In the house which science might build there are many mansions". (J. DEWEY, "Unity of Science as a Social Problem", *International Encyclopedia of Unified Science*, *op. cit.*, p. 34.)

languages may have actually the effect of legislating into permanence the artificial barriers between the theoretic *(a priori)* components of Western knowledge and that which is more immediately apprehended, the so-called aesthetic (intuitive) component, to follow Northrop's terminology. In fact, given the theoretic component of all Western knowledge, the unity of science movement would either erect unsurmountable barriers between the two components and split our knowledge into two hostile branches or, failing this, it would have to abandon its fear of a superscience and shift either to some "physicalism" or some "organicism" to which the rest of our knowledge is to be reduced.

Indeed, it is this unproved belief that it is somehow possible to go from one field of inquiry to the next without changing scientific procedures, terminology and concepts which is open to the most serious doubts. As much as one may share the positivistic rejection of system-building based upon speculative conceptualizations and hidden ideologies one wonders whether the tacit assumption that there are no differences in quality between the subject-matters of the different disciplines is not a new form of system-building in disguise. In any event, the belief in an unqualified unity of all subject-matters of scientific inquiry and hence of all knowledge can be accepted, if at all, only as a hypothesis calling for explicit demonstration and proof[31].

5. *Dialectical Materialism and the Integration of Social Knowledge*

Dialectical materialism has long claimed to provide a unified interpretation of human experience and of the mode of transformation of

31. It is significant that, in a recent publication devoted to the unification of science by means of logical empiricism, the limitations of the whole approach are admitted in the following words: "It has turned out more and more that these problems (i.e. problems related to the unification of science) cannot be settled definitely on the basis of logical and semantical analysis. There remain always several possibilities for the choice of formal system". (PH. FRANK, Introductory Remarks, in "Contributions to the Analysis and Synthesis of Knowledge", *Proceedings, American Academy of Art and Science*, Vol. 80, July 1951, p. 7.) Instead, it is now realized that there is room for a combination of logical analysis and intuition. Logical empiricism thus supplemented by speculative synthesis and enlarged by the introduction of considerations from the various social sciences would offer indeed a new and more fruitful point of departure for the unity of science movement.

phenomena in space and time. For this reason the dialectical materialist will look with suspicion upon any attempt to bring into meaningful relationship the work of the various disciplines through some kind of new synthesis other than that provided by dialectical materialism. He will be inclined to denounce such attempts as endeavors disguised either to conceal the irrationalities of contemporary society or to evade the serious issues of our time or both. Indeed, it has been claimed that all these attempts are merely "pseudo-solutions" of the problem of intellectual integration which can be avoided only by the most rigorous application of the principles of dialectical materialism and their extension from the study of the evolution of society to the theories of inanimate nature and living organisms including their evolution[32].

No serious student will deny that dialectical materialism represents indeed a highly integrated explanation of reality which, on the basis of a general philosophy of history, sets out to interpret the dynamic interaction of economic, political and intellectual processes. This is not the place to go into details of the manner in which the technical interpretation of "production relations" is combined with a theory of the political and intellectual "superstructure" to support a dialectical theory of history. For the purpose of our discussion it is sufficient to state what we consider to be the positive

32. "In our contemporary society the specialized sciences are, indeed, rigorously separated from one another. Each of the various disciplines has its own formalistic methodology which is based upon non-dialectic, epistemological categories. This is the reason why certain relationships which one or the other of these specialized sciences is perfectly well capable of treating as relevant for its own investigations, can be considered by another specialized science only as irrational data. In order to overcome these speculative difficulties the social need for a unified ideology gives birth to the theory of sciences and their historical *tableau*. In contrast to the minor philosophers of the preceding epoch one aims at totality and unity. But, as we have shown, the seekers of totality and unity have chosen the wrong road. In reality, it would be perfectly possible to disentangle the common basis of all sciences through a study of the evolution of society which is itself determined by the economic factor. Now, it goes without saying that contemporary bourgeois thought cannot take this road which would lead to the recasting of all sciences in terms of the method of dialectical materialism.... Consequently the only new thing which the (contemplated) speculative synthesis could offer would be the mystification of irrational relationships". (Translated from GEORGE LUKACS, *Existentialisme ou marxisme?* Editions Nagel, Paris 1948, p. 66/67.)

elements and the weaknesses of the integrated interpretation of social phenomena provided by dialectical materialism.

The positive elements of dialectical materialism can be listed briefly as follows: To have shown that history must be viewed as a process of development and transformation which can be interpreted and forecasted effectively "by paying attention to the manner in which one set of theoretical assumptions underlying the economic, political, aesthetic and religious institutions of a given stage of Western history is in part or wholly negated by the advent of some later, basic philosophical theory"[33]; to have shown the transitory character of all historical stages in the development of human society; to have combined this view of the essentially transitory character of existant reality with a theory of interaction and interdependence of the economic, political, intellectual-volitional aspects of culture; in fact to have recognized the interaction between objective reality and our consciousness and to have placed this interaction into the center of social research—these are the positive contributions of dialectical materialism to social knowledge. No future integrated social science is likely to disregard these important positive elements of dialectical materialism. Nor is it accidental that virtually all the younger social sciences as for example sociology, cultural anthropology and social psychology have made extensive use of dialectical materialism in their analysis and in the formulation of their theoretical constructs.

What then are the limitations of dialectical materialism as an approach to the integration of social knowledge? Generally speaking the answer is not difficult to formulate. The limitations are not to be found in the neglect—as is so often asserted—of the power of man to shape his own history and the scope of the volitional factor in general. Closer examination reveals this particular criticism of dialectical materialism to be based upon a misinterpretation[34]. The

33. F.S.C. NORTHROP, *The Meeting of East and West*, Macmillan, New York 1946, p. 249.

34. See e.g. Marx' famous statement "Men make their own history, but they do not make it just as they please" (K. MARX, *The 18th Brumaire of Louis Bonaparte (1852)*, International Publishers, New York, n.d., p. 13.) Also Engels' more explicit statement on the role of the human will in history bears rereading: "We make our history ourselves but first of all with definite premises and under given conditions. Among the totality of these conditions the determining ones are the

weaknesses of dialectical materialism derive rather from the fact that it has not been able to escape the danger apparently inherent in any philosophy of history, namely to rewrite history in line with the *a priori* conception of its pre-analytical creed or ideology. This is, of course, a weakness which dialectical materialism shares with its intellectual mentor: German Idealism. Just as Hegel's idea of a philosophy of history in the end negated the history of the historians by introducing all kinds of distinctions between facts according to whether or not they were able to lend support to the theory, so does dialectical materialism threaten to absorb the rest of our knowledge by predetermining the collection and interpretation of data. Like so many other systems of social thought dialectical materialism fails the "scientific test" in as much as it is not a self-correcting system. Dialectical materialism is not and indeed does not claim to be based upon any verified knowledge concerning the nature of man and the behavior of human groups nor for that matter concerning the nature of human society and social reality in general. As a result, a whole series of problems related to the non-rational aspects of human behavior, the interaction of social groups and their perception of and reaction to social change and power in society are not faced. Instead, the dialectical materialistic conception of history produced

economic conditions in the last analysis.... Second, history is made in such a fashion that the final outcome is always the result of the conflicts of a great number of individual wills of which each is conditioned (shaped) by a multitude of unique conditions; in other words, we are faced with innumerable forces which are opposed to and mutually thwart one another, an infinite number of parallelograms of forces which gives rise to the historical event. The event in turn may be regarded as the product of a force which acts as a whole and in an unconscious and blind way. For that what each individual wants is prevented by every other individual and the final outcome is something which nobody had willed.... But the fact that the different wills do not succeed in realizing their objectives but are recast in a general average and a common resultant does not justify the conclusion that the significance of the human will (in producing the historical event) is equal to zero. On the contrary, each individual will contribute to, and hence is included in, the final outcome". (F. ENGELS translated from LUKACS, *op.cit.*, p. 149.) On the whole subject and the role of consciousness and chance an outstanding biographer of Marx was able to write: "Marx specifically recognizes the power of man to react on his environment, and he does not attempt to circumscribe the freedom of the individual will. The action of the individuals will be effectual if they are in accord with the social development of the age, ineffectual if they are directed against it". (E. H. CARR, *Karl Marx: A Study in Fanaticism*, Dent & Sons, London 1934, p. 79.)

a theory of class behavior in industrial society which was derived from the history of pre-industrial and largely pre-democratic societies. Just as the mechanistic conception of the socio-economic development gave rise to the mechanical conception of the economic man motivated by the search for material profit, so did the dialectical law of historical materialism read into the structure of individual and class behavior and political action all those elements of conflict and struggle which were in harmony with the assumed properties of the historical process. Similarly, instead of deriving a theory of biological and physical reality from the verified knowledge concerning the structure of the physical universe and biological organisms, the dialectical theory of the development of culture tends to become the model of the concept of nature[35].

Thus the first basic weakness of dialectic materialism as a method of integration may be summarized as follows: While dialectical materialism was from the very outset a theory of social dynamics and never fell into the trap of interpreting man and society in terms of a static theory, it was not and still refuses to be based upon an explicit theory of human nature and human behavior. Hence as a theory of the transformation and dynamic change of society, the validity of dialectical materialism suffers from the same weaknesses which affect the validity of other prematurely formulated philosophies of history: namely the tendency to become a closed system by selecting with a view to making the facts fit the theory.

The second major weakness of dialectical materialism as an integrating principle concerns our investigation only indirectly; nevertheless it is of sufficient importance to be mentioned in this context. It has to do with the underlying tendency of thinking in terms of

35. For a further discussion of this "reduction of nature" to the law of cultural development and the insistence upon "making nature march through the paces of the dialectics", see NORTHROP, *Meeting, op. cit.*, p. 248. Some scholars working in the tradition of dialectical materialism have pointed to the danger involved in any attempt to reduce some sciences to others; see M. Prenant (1933) and B. Zavadovsky (1931) quoted from J. NEEDHAM, "A Biologist's View of Whitehead's Philosophy", in *The Philosophy of A. N. Whitehead* (P. A. Schilp, ed.), Tudor Publishing Company, New York 1941, p. 254. Unfortunately the strictures which these writers advance seem to apply only to attempts to reduce biology to physics whereas the question of the reducibility of nature to the dialectic law of cultural development is either not faced or implicitly affirmed.

dichotomies. In the dialectics this typical characteristic of our thinking takes the form of a dualistic theory of opposites (of thesis and antithesis) as a theory of transformation and change of reality. As a result of the assimilation of this mode of thinking in terms of dichotomies, a mode of thinking which has dominated Western thought until recently, dialectical materialism tends to impute a dualistic character into the structure of historical processes and social interrelationships which have the effect of exaggerating both the tension in and the determinacy and predictability of the final outcome of social processes. More precisely, what is overlooked is the fact that there may be more than one antithesis to any given thesis and hence more than one synthesis from any juxtaposition of thesis and antithesis[36]. In short, the logic of the dialectics properly understood does not support the conclusion of a determinate outcome such as the inevitability of capitalistic crisis and the inevitable polarization into two classes, the declining tendency of the average rate of profit to which the Marxian interpretation has either given rise or lends support.

We are thus led to conclude that while dialectical materialism offers an integrated interpretation of reality, its usefulness is seriously impaired by (1) the fact that it is not based upon an empirically verified knowledge concerning the nature of man (and hence of groups and classes) and (2) the determinacy falsely imputed to the logic of the dialectics[37].

6. Toward a Positive Solution

The foregoing critical evaluation must not be interpreted to mean that there can be no satisfactory solution to the problem of integration of the various social disciplines or that such integration is un-

36. "From the negation of a present thesis one does not get one specific antithesis but at least a finite and probably infinite number of antitheses. And from a specific antithesis standing over against its prior thesis there are at least several theories which might provide a synthesis". (NORTHROP, *Meeting*, *op. cit.*, p. 246.)

37. Lenin seems to make a slight concession in the direction of indeterminacy when he writes: "History... and particularly the history of revolution is always more variated, richer, more complex and more subtle (cunning) than even the most (class) conscious vanguards of the best parties and of the most advanced classes imagine". (Translated from LUKACS, *op. cit.*, p. 291.)

desirable. On the contrary, as we pointed out before the foregoing analysis has been motivated by the conviction that a positive solution of the problem is not only possible but also desirable. We cannot do more here than to outline in general terms what we consider to be the positive approach to the problem of the integration of social inquiry[38]. A positive solution of our problem will require two things: First, a systematic attempt to view socio-cultural phenomena and events as processes pertaining to a special level of organization and second, the deliberate construction and systematic employment of broad conceptual frameworks in terms of which the specialized subject-matters of the various social disciplines can be meaningfully expressed and related with one another.

Human society, although intrinsically linked with other structures such as living organisms and inanimate nature, nevertheless must be regarded as an essentially different and unique level of organization. While the three levels of organization represented by human society, living organisms and inanimate matter can be shown to be continuous both in the evolutionary sense and in the sense that the social includes the other two and the organic "envelops" the inorganic, each exhibits at the same time qualitative differences in the form of different degrees of complexity. Indeed so marked are the differences that each of the three levels of organization can be shown to be a special type of structure. For this reason also each of the three levels of organization, although interconnected and interrelated, raises new questions and special problems which cannot be adequately treated in terms of the concepts and principles which have proved suitable to the others. Hence it must always remain futile to try to link the various fields of knowledge and to aim at a complete unification of our total knowledge by means of an overall synthesis in terms of either one principle or one common methodology. Any such attempt can only lead to either a forced rationalistic or a mystical unification but not to a rational understanding of the universe.

Indeed, the following statement in which one of the leading atomic physicists refers to the various parts of modern physics applies with equal force and validity to the attempt to use the validated results and methods in one field of inquiry in all others. "The edifice

38. This approach is set forth in greater detail in the author's forthcoming book *The Integration of Social Inquiry*.

of exact science can hardly be looked upon as a consistent and coherent unit in the naive way we had hoped. Simply following the prescribed route from any given point will not lead us to all other rooms of this building.... The advance from the parts already completed to those newly discovered, or to be newly erected, demands each time an intellectual jump, which cannot be achieved through the simple development of already existing knowledge"[39].

The integration of our knowledge of man and society depends, in our estimation, upon the elaboration of broad conceptual frameworks in terms of which it is possible to define and to interpret all the phenomena and events related to human behavior and sociocultural processes. The basic principles which underlie this approach to the problem of integration are relatively simple. They are derived from the realization that our scientific knowledge is expressed in the form of interrelated hypotheses and theories which themselves are referring to basic concepts and conceptual frameworks which define, interpret and reconcile a large field of human experience. Phenomena which seem to common sense perception to be disconnected, disparate and even opposites may prove to be connected and completely reconcilable in terms of a new and wider conceptual framework. In short, the unification of social inquiry presupposes a widening of our basic conceptualizations in such a manner as to give systematic and as far as possible unequivocal expression to those elementary facts and their functional connections which are fundamental and common to man and society. The social scientist who is interested in overcoming the present compartmentalization of social knowledge must endeavor to find or construct broad basic concepts or symbolic representations of social reality which provide an orderly and unambiguous framework for the comprehension of social phenomena and their functional interrelationships.

Viewed in this fashion the unification of social knowledge does not differ from the task of scientific inquiry in general. To show interconnections, to proceed from partial knowledge of isolated facts to a more comprehensive understanding of interrelationships between facts; to relate diverse phenomena and theories to a more comprehensive scheme; to show how explanations offered at one

39. W. HEISENBERG, *Philosophic Problems of Nuclear Science*, Faber, London, n.d., p. 25.

level of analysis are the consequences of more basic and comprehensive rules and regularities; to show exactly the nature of the continuity and relationship which exists between the various levels of analysis, these intellectual efforts are indeed part and parcel of the effort of arriving at a scientific explanation of the world. In fact, all scientific explanations consist precisely in the demonstration of the connections between confirmed uniformities and generalizations within a given field as well as between different fields of analysis. In this sense, scientific explanation ultimately calls for some kind of subsummation (reduction) of an explanation under some more general law or regularity. The greater the comprehensiveness of the latter, the greater the degree of integration achieved.

CHAPTER IV

ON THE PROBLEM OF THE DEHUMANIZATION OF "PURE THEORY" AND SOCIAL REALITY*

[In this chapter, Kapp stresses the inadequacy of necessarily limited mathematical models in explaining human behavior in sociological or economic terms and traces the dehumanization of the social sciences which has been the result. In one sense, he takes social scientists with such proclivities at their own frequently rather generous valuation; the reason why models are often simple, not to say simplistic, is precisely that the mathematics are then easy to handle. This is not a matter of satisfaction, however; the constantly and rapidly rising capacity of computers and their declining cost makes large scale analysis ever easier, especially in the methods of multivariate analysis. The problem actually lies not so much with the models themselves as with the fact that they neglect variables whenever they cannot be readily measured; as Kapp notes, that is the real problem.

Kapp traces the effects of dehumanization to strategic game theory, advertising and political manipulation. His projections of a dehumanized society, made almost two decades ago, are generally correct, even though some of the automated control systems which he cites are not yet a reality. However, extra high speed missiles like the Pershing II's and their Soviet counterparts make responses like "launch on warning" ever more likely and the decision to launch a nuclear attack may soon itself be made by a computer. The doomsday machine which was only a Strangelovian fantasy when Kapp's article was written, will then become a reality, buttressed by the Reaganite doctrine of a "winnable" nuclear war. Thus the game theory criticized by Kapp eschews even its inadequate zero-sum criterion for that of an infinitely negative one.

As to the manipulation of people, this too has burgeoned mightily. In politics, it has brought new

*K. Wm. Kapp, "Zum Problem der Enthumanisierung der reinen Theorie und der gesellschaftlichen Realität," Kyklos, XX No. 1, 1967, pp. 307-330. Translated by J. E. Ullmann and J. Cartwright.

effectiveness to propagandizing so that even a nominally rising level of education has not led to a more extensive and concerted rejection of political incompetence, fatuities and delusions. Neither has it stemmed the loss of critical consciousness decried by Kapp, which loss is itself a sign of dehumanization, of helplessness, fatalism and indifference. The results in terms of the kinds of governments now existing, their abilities and their behavior toward their own and other peoples, speak rather miserably for themselves. J.E.U.]

[In 1927], Edgar Salin characterized as an ominous reality of German history of ideas the fact that almost all the sciences of the 19th century, and in particular all the economic and social sciences, had remained untouched by the humanitarian and socially critical points of departure found in Goethe, Hölderlin and Nietzsche.[1] [In 1955], Salin emphasized afresh that "when today I have to note what anaemic, purely rational conceptual work is repeatedly expected of beginners and is labeled specimen eruditionis, ... then it appears to me that the better intellectual development of today has been bought all too dearly with a loss of humanity."[2]

I. The Consequences of Positivism in the Social Sciences

What Salin criticizes in these remarks is basically a scientific enterprise that limits itself more and more to the collection of actual data and the explanation of existing relationships between factors or variables, and rejects every question about the meaning of these data and relationships as being outside the realm of science. This positivistic ideal of science looks upon the language, logic and precision of mathematics and the mathematical equation as the unassailable prototype of the scientific statement. In order to do justice to this ideal, a method of abstraction is required that concentrates on a few factors whose logical relationships are analyzed with the aid of closed conceptual models. One of the necessary consequences of this kind of isolating abstraction was the splitting up of the practical political knowledge of antiquity and of the philosophy of the enlightenment, into numerous specialized sciences. This process, which is still in progress today and is usually defended with the assertion that the human intellect is incapable of comprehending

social relationships in their total complexity, results inevitably from the positivistic ideal of science. Whoever elevates the precision of the mathematical equation, linked to mechanics, to the prototype of scientific expression in the social sciences, is increasingly forced to study processes and relationships without taking their social context into consideration. Factors of far-reaching causal effect and relevance (such as for example decisions in the fields of international power politics, population changes, structural developments) are looked upon as "exogenous" factors that remain outside the framework of the model. They are either banished to a neighboring discipline (where they are treated, if at all, only from the perspective common to that discipline) or they become the object of social hybrid disciplines. In other words, the renunciation of a comprehensive social science of the kind that Comte still held possible and necessary, corresponds exactly to the positivistic scientific method demanded by him.[3]

A further consequence of the positivistic scientific method is the danger that the scientific analysis establishes itself a priori as static theory. This is also in accord with the tendency to concentrate on the study of actual realities in the sense of the status quo. The elimination of the time factor and the use of undated numbers in the construction of theories and conceptual models has far-reaching and serious consequences. To be sure, the static approach accords with and serves the aspiration for precision and makes possible the derivation of the equilibrium positions within the conceptual models; but these results are only achieved by separating the regular, repetitive or uniformly continuing relations from the cumulative and structural changes and processes, as if the static elements had an independent existence and were the first step or prerequisite for a real dynamic evolutionary theory of social and economic processes. Social processes that tend cumulatively in the same direction and preserve rather than eliminate the existing disparities and stagnation can in this way be relatively easily left out and thus largely neglected. Further, the analytical distinction between statics and dynamics in economic theory has often led to the view of the tendencies toward equilibrium derived from statics as regular ones and the equilibrium as a norm, whereas tendencies and factors, opposed to this normality, are excluded from the discussion as coincidental inconveniences or as

external factors. In other words, here too analysis in the social sciences is in danger of purchasing the precision of its statements with a withdrawal from reality, thus calling into question the value of its statements and its practical relevance.[4]

Of no less importance, and directly connected with the loss of humanity in the social sciences emphasized by Salin, is the danger of surrendering critical awareness in relation to reality. Anyone who a priori rejects as metaphysical curiosity every concern with the meaning and significance of social processes fails to take a number of matters sufficiently into account. He overlooks first of all that social processes and arrangements are polarized according to values and thus emotionally. They are not only subject to the value-oriented reactions of man; the social realities and phenomena appear within and as a part of institutions to which value-bearing significance is ascribed and which have the tendency to extol themselves in one way or the other (for instance as the prerequisite of rationality, justice, freedom and the development of the human personality). Here it is not always and necessarily a question of ideological and apologetic justification even though this is often the case. What is important is the fact that social institutions and the procedures and processes conditioned by them cannot be comprehended except from the perspective of a particular formulation of the questions to be investigated. In this sense they actually are facts from one perspective only and this perspective already contains elements of a value-oriented interpretation of meaning. In other words, the assumed factual realities are not data but derivations.[5] It can even be demonstrated that it is often these interpretations of meaning and the teleological perspectives connected with them that stimulate the scientific interest and from time to time have led to a new formulation of questions in the social sciences. This is particularly true for the great creative founders of new theoretical systems in economics.

There is the further point that social reality in the final reckoning yields and can yield the development or improvement of man's personality and his freedom only when judged against man's real interests. These may be empty words from the standpoint of the positivistic scientific method; they need not be so to the extent that one is in the position to arrive

at an empirically verified concept of man. Of one thing we may however be sure: "whoever does not measure human (and social) matters against what they themselves wish to signify sees them not merely superficially but falsely."[6] Whoever wants to limit systematically his scientific statements to presumed factual realities and does not want to measure social processes against the interests of man or at least the values which the institutions claim for themselves, has no protection against seeing things wrongly.

Furthermore, it can even be shown that the positivistic scientific method by no means protects theoretical knowledge from empty formulations that exclude themselves from empirical refutation. This danger is the greater the more the theoretical analysis is limited to the study of the logical relations of factors removed from their social context or of pure definitions -- a limitation which, as we have suggested, is the prerequisite for the precision in statements aspired to by positivism. Such empty formulas can be maintained in the social sciences for a particularly long time, on the one hand because in principle they seek to escape refutation, and on the other because the same difficulties oppose their elimination as those that impede in general the falsification of theories and prognoses in the social sciences (for example the non-fulfillment of the ceteris paribus conditions, structural variability and the complexity of the empirical materials available for purposes of refutation). In pure theory and in certain model constructions such empty formulas are carried over from one generation to the next; they have the not necessarily conscious purpose of introducing an interpretation from a preconceived perspective (for example that of rationality) into the actual course of events.[7] In this projection of an idealized relationship into social reality, instead of an analysis of the actual interrelationship of effects, lies an equally great danger for the social sciences, as in the already mentioned dissolution of critical awareness with its resulting attitude towards the status quo. Whoever stands aloof from this question endangers his own claims to scientific objectivity, quite apart from the fact that he places himself and his science in the dangerous position of furthering the official ideological and apologetic interpretation of what is significant.

The limits and dangers of positivism in the social sciences thus lie in the splitting up of knowledge into multifarious special sciences, in the problematical distinction between statics and dynamics, in the surrendering of critical awareness in relation to reality and in the projection of ideological-normative idealized relationships instead of the analysis of actual interrelationships. These are the tendencies that have led to a renunciation of reality and to a loss of humanity. Only by overcoming these consequences of positivism would it become possible for the social sciences to grow beyond a science of "as though" (Salin) into a science of the future (List) which at a time of rapid technical and social change would be of far greater value than a "science of the past."[8]

II. The Dehumanization of Positive Economics

Whoever seeks ways and means of overcoming the "loss of humanity" of the social sciences must not only be clear in his mind about the consequences of the positivistic scientific method. He would also be well advised to obtain clarity on some aspects of positive economics without falling into a superficial critique and general rejection of theoretical inquiry. It is hardly necessary to emphasize that scientific methods and theoretical thought are impossible without abstraction and that every abstraction always represents a simplification or departure from concrete reality. Without this human capability of abstraction, that is, the ability to observe selectively and with simplification certain elements of concrete reality, one cannot carry out theoretical work which attempts to define the concrete case as the regularity by which future situations can be explained. Abstraction is the precondition for every scientific study, independent of whether the study is in the physical or social sciences. The artist also becomes abstract by leaving out what is unimportant for him from a particular perspective. Neither the theoretician nor the artist are photographers, which does not mean that the photographer works without choice or perspective. For these reasons it would be wrong to believe that mathematics possesses a monopoly on abstraction. Mathematics only represents a specific form of abstraction insofar as its definitions, concepts and symbolic representations have, in principle, really no empirical equivalent in reality. They represent a pure construct of the human cap-

ability for abstraction; here, it appears, lies the strength of mathematics as a formal science as well as its limitations as an auxiliary instrument for the social sciences. In other words, the following discussion is neither on abstraction as a theoretical method nor on the significance of mathematics. What is to be questioned is the manner in which, under the influence of the positivistic ideal of science, certain parts of economic theory have distanced themselves from the concrete interests and needs of man as well as from social requirements.

The estrangement from the real human components of economic theory is already rooted in the fact that in money and capital accounting, economics has a measure at its disposal which impedes, if it does not actually exclude, an adequate comprehension of the concrete needs of man and society. Effective demand and cost accounting in monetary terms or at market prices express at best only a part of the concrete needs and the real costs of production. Neither social benefit nor socially damaging social costs are recognized by the monetary accounting of the market.

A further estrangement from concrete reality is represented by the predominant hypothesis of behavior in economic theory of homo oeconomicus. Originally this hypothesis was brought forward in the market economy as a generalizing simplification of human behavior and as such still possessed an empirical content or at least a relation to reality. In the course of the progressive abstraction of economic theory this behavioral hypothesis has become more and more a fiction of idealization that is no longer relevant in the question of real human behavior.

Only with the help of this hypothesis, which treats certain concepts of conscious and premeditated human behavior either as isolated idealizations or as norms, could pure theory achieve the desired precision and the determinism of its theoretical statements that correspond to its scientific ideal. In other words, the hypothesis serves only the purpose of deriving statements and theories mechanistic in content and also in form. But this result can only be achieved by abstracting it from actual human behavior. It makes hardly any difference whether one uses the hypothesis of "economic man" as a generalizing assumption with empirical affirmative value or as an idealized fictional concept or simply as a norm. In pure theory

man was regarded simply as a creature which acts automatically or as a mechanically reacting object long before a robot kind of human behavior was even discussed. The assumption of total knowledge of market conditions and the perfect elasticity of the factors of production which is closely connected with the hypothesis of economic man and profit maximization, serves the same purpose as the derivation of precise statements within closed systems based on theoretical models.

Further tendencies towards abstraction are to be found in modern macroeconomic model analysis. Just as the precision of microeconomic statements rests on the assumption of economic man, macroeconomics owes its precision to the extensive use of concepts and magnitudes which are by their nature aggregates or average values. Every student is taught in the first term of statistics that in the case of these aggregates we are confronted with abstractions in the sense of a -- not always unproblematic -- simplification of reality. It is nevertheless questionable whether one is quite clear about the extent and consequences of this abstraction. It has perhaps long been understood, although often overlooked that not only regional stagnation and increasing disparities can be hidden behind increasing general growth rates and growing income per capita of the population. It is at least just as important that the aggregations can only relate to the quantities of goods and money values and not to the consequences of social conditions and processes or to the quality of human needs. This explains why values which are external to the market and cash nexus by their nature or for institutional reasons are neglected by the method of global quantification. This is true not only for the socially damaging social costs but also for social benefits and requirements in general. Critics of the conventional wisdom have always taken account of these neglected social costs and social benefits considered unworthy of mention in the traditional aggregations; and they have even tried to get them placed in the center of the discussion. Politicians have also from time to time pointed to the dangers of neglect of important aspects of the quality of social life despite rising aggregates of income and growth rates.[9]

The highest degree of alienation from humanity and the dehumanization of thinking in aggregates is expressed today in those calculations by which an

attempt is made at theoretical comprehension of international conflicts. This occurs for instance in certain strategical debates which, with the aid of formal game theory view international conflicts as game situations assuming that one side can only win what the other loses (zero sum game). The "goal" of military strategy now becomes the maximum benefit gain or the minimal benefit loss that can probably be expected according to certain assumed rules of the game (rational action by the enemy, whose strategy is also aligned towards maximum benefit gain). For example, one thus arrives at a calculation of one's own probable loss in comparison to that of the opponent (for instance 100 million versus 150 million dead) -- calculations that effectively render abstract the meaning of the losses or the "gains," much like commercial profit and loss accounts that only consider a part of the costs and possible profits. What is discussed are only the relative relations of scale in losses of millions of human beings. With the aid of such calculations the aim of the strategy or escalation becomes the achievement of a relative advantage over the opponent, that is the retention of the upper hand, the possibility of reconstruction or the acquiring of a strategical position from which the next round can be planned in the face of the destruction meted out on the opponent.[10]

Quite apart from the fact that the extent of the actual destruction and loss of human life is impossible to estimate, such a calculation and a diplomacy based on it necessarily contribute to the further polarization of existing conflicts, if not their actual perpetuation. The strategy of deterrence and the principle of the balance of power are replaced by a strategy of continuing mutual threat, the "balance of terror." An analysis and identification of the elements of conflict is hardly under discussion any more. What the losses could really mean in the concrete case is neutralized or played down to insignificance. The extent of the destruction of the cities, the wearing down of the surviving population by hunger and sickness and the additional, cumulative destruction which could be much greater than the number of the dead by explosion and immediate fallout is thus not even included.[11] The same is true for the psychological and traumatic shock effects as well as for the possibility of panic and mass psychosis among the survivors that could result from the annihilation of two-thirds of the total population.[12] In other words,

by expressing the state of affairs only quantitatively in aggregates in the form of relative orders of magnitude we divert attention from the true consequences of our actions; we comprehend the state of affairs only in abstracto, that is, in many cases incompletely and falsely. This is true not only for the strategical deliberations in the age of atomic war but pari passu for the quantification and aggregation methods of the economic and social sciences in general.

We come then to the conclusion that the loss of humanity in positivist economics is to be traced back to the nature of its methods of abstraction. The formal principle of rationality based on monetary calculation which determines the way of thinking in contemporary economic theory, the behavioral hypothesis of homo oeconomicus, and the increasing application of aggregates and average values in the macroeconomic model constructs represent a withdrawal from reality and a neglect of humanity, whose behavior is only discussed in an idealized, fictional form. The real interests and needs of humanity and the requirements of society are hardly being discussed any more.

This kind of abstraction in pure theory allows us to recognize a striking resemblance to abstract art. Both abstract art and the economic theory of which we are speaking here seem today to flee from reality by the construction and representation of abstract, geometrical forms. However one wishes to explain or justify this development, it has in both cases led to alienation from humanity and to a loss of critical awareness. The individual human being, with his interests and needs, the problems of his existence, the often inhuman consequences of social institutions, all fade into the background or disappear from the scene. In place of the inspired artist, with a capacity for compassion and for suffering along with humanity, there is an objectivity in which the abstract artist has completey misunderstood the role of abstraction as an auxiliary tool and working hypothesis in science, and views it instead as the highest and ultimate achievement.[13] It is as if in the era of the totalitarian state and thermonuclear war, man has become a quantité négligeable or no longer exists at all. Just as abstract art may be considered "as though" art and critics rightly speak of a dehumanization of art,[14] so can the consequences of pure theory and the methods of abstraction peculiar to

it be similarly identified as a dehumanization of the economic and social sciences. This dehumanization is expressed today above all by the increasing extent to which theoretical inquiry proves itself incapable of building a bridge to practical action. In this lack of relevance and applicability of formal, theoretical knowledge for the recognition of what needs to be done we see one of the most critical aspects of the loss of humanity in the economic and social sciences.[15]

III. The Dehumanization of the Social Framework of Life

The dehumanization of the social sciences is neither a single nor an incidental phenomenon. It has its parallels not only in abstract art but in the progressive mechanization of life as well as in the tendencies that lead to the totalitarian state. It is not our intention to show the reciprocal and cumulative causal relationships between the dehumanization of economics and art on the one hand, and the dehumanization of social reality on the other. Our diagnosis of the dehumanization of inquiry in the social sciences would however be incomplete without investigating some aspects of this dehumanization of the social framework of human life. Just as abstract art has broken all its ties with the classical tradition, so the application of modern technology has also led to consequences for social realities which thereby stand to lose to an increasing extent every connection with Western humanism. A scientific understanding of this development must beware just as much of a romantic and emotional idealization of preindustrial social conditions, such as can at present still be observed in the underdeveloped countries, as of a pessimistic nihilism that ignores the positive potential which could be provided by the progress of the natural sciences and technology.

The impact of modern technology on man and society is a subject that really requires an interdisciplinary treatment by the social sciences. Partial analyses of this subject, such as have been undertaken by single social sciences, necessarily treat the problems from a narrow perspective, which provides an incomplete picture. Economic theory has posed the problem in the main as a question of the long-term influence of technology and the machine on the demand for labor. Seen historically, among the great names of political economy, only Adam Smith, Marx and Veblen

have manifestly devoted themselves to the problem here under discussion -- if one disregards some remarks of Alfred Marshall's. And yet there can hardly remain any doubt that the consequences of the dynamics of science and technology for man as a worker, consumer and citizen belong exactly to the central problems of development in the social sciences as well as of economic thought.

Since Marx and Veblen, it can be taken as established that the application of modern science has continually and radically transformed human social life; that is, it has transformed the conditions of labor and production, customs and institutions as well as modes of thought, in short, the social framework of human life. Modern science and technology are not only the dynamic elements of modern society: They are at the same time the great antagonists (and destroyers) of tradition in all fields. They are the cause of increased production, of the greater diversity of goods and services, as well as of a continuous growth in the productivity of human labor. In science and technology, modern man possesses the means to create for himself with slight expenditure of labor, the prerequisites for a more complete development of his personality and abilities. With the aid of modern technology he is in the position to liberate himself from work which either overtaxes him physically and mentally or, in other cases, only lays claim to a minimal part of his intellectual capabilities; modern technology is indeed capable of contributing to his liberation and emancipation.

In this sense it would be thoroughly wrong to believe that the application of modern technology must necessarily lead to a loss of humanity and to the dehumanization of the social framework of life. Not at all; it offers the prerequisite for a humanization. Without modern science and technology it will be quite impossible to solve many of the problems facing mankind, particularly in the underdeveloped countries. This does not mean that the technology has to be the most elaborate and modern; it rather means that it has to be adapted to the particular situation of the importing country -- in short an intermediate technology. But this in no way means that technology, which creates a <u>potential</u> prerequisite for the liberation of man, has <u>in fact</u> led to a humanization of the social framework of life; its impact has largely had the opposite effect, because its application is in

fact mainly determined by the formal principle of rationality. The inner logic of technology and mechanization indeed pushes us towards precision, continuity, coordination and the monotonous repetition of automatic routines. The principle of rationality requires the highest intensity of utilization of the machine, regardless of the socially damaging social costs, including the "human" costs. This connection of two factors (the inner logic of technology with the formal principle of rationality) has led to the machine compelling man to adapt himself to its own rhythm, i.e. to an automatic, robot-like discipline, that finally threatens to make man himself a part of the machine and the synchronized, mechanical process. Man is forced to adapt himself to the machine's speed and to keep pace with it.[16] It is therefore in no way surprising that the application of modern technology has in many cases led to a dehumanization and is experienced as such by man himself. The worker responds to this dehumanization with different reaction mechanisms ranging over a whole scale of phenomena that extend from psychosomatic signs of fatigue to psychopathological symptoms.[17]

We may be long before the completion of this new stage of the technological revolution, but the closer we approach the age of automation and the world of computers, the greater seem to be not only the potential possibilities for the liberation of man from the monotony of the machine but the greater also becomes the danger of an increasing dehumanization of the framework of human life. What remains for the worker to do in the fully automated factory are some few simple routine jobs, that hardly place any demand on his intellectual or technical abilities and interests, and which sooner or later will be able to be taken over by automated machines. It cannot be said whether and how automation will determine the working conditions of the total labor force in the foreseeable future. This is at least possible in principle and the current agenda therefore already encompasses the problem whether man in the future will not have to find the meaning of his life outside the work process, that is, in his leisure time. We cannot enter here into all the social and political consequences of automation and computerization, as important as these may be by themselves and in the long view. Thus, we must forego, for instance a discussion of the potential weakening of the trade unions, although this could be of far-reaching political import and economic

consequence.[18]

At least as significant, if not even more so for the dehumanization of social life, are certain political perspectives, although they likewise cannot at the moment be predicted with certainty. However, facts and possibilities already speak plainly for themselves. Some of these illustrate the dangers which a world totally rationalized and dominated by computers represents for man. If we project the previous progress in automation into the future then before 1984 it should already be possible for the whole of banking and taxation, the road and transport system, as well as parts of the health services and criminology to be put onto and controlled by computer systems. Those already in use today can thereby function as central coordination and storage systems for all relevant private and public data. The authorities would, with the aid of such systems, be at all times in the position to establish a total review and control of the behavior of every single citizen.

> "The United States Internal Revenue Service is installing a very large computer system and it will soon be extremely difficult for any American to avoid paying his full income tax, since, whenever he makes a financial transaction that is likely to attract tax, information about it will be fed into the system. This is perhaps all right, but how would you feel, if you had exceeded the speed limit on a deserted road in the dead of night, and a few days later received a demand for a fine that had been automatically printed by a computer coupled to a radar system and vehicle-identification device? It might not be a demand at all, but simply a statement that your bank account had been debited automatically."[19]

Automation and the application of computers contain even greater dangers for man and society than in the possibilities mentioned here. Combined with the methods of public opinion analysis and with a voters' choice theory based on them and using simulation techniques as a method of influencing the mass of voters, computers can at any time use pseudodemocratic means to arrive at a means of political domination.

Friedrich Pollock has described how these methods

were already in use during the American presidential election of 1960. The leaders of the Democratic Party were faced with the decision of whether and how the question of religious denomination (President Kennedy was a Catholic) should be most effectively treated in the election platform during the campaign as well as in the great television debates. "Studies made after the election showed that the correlation of the results of simulation with the actual voting behavior in respect to the question of denomination was 0.83, a result that ... should give rise to a fundamental reflection on the theory of parliamentary democracy."[20] Pollock comes to the conclusion that with the aid of the computer, it has now become possible to offer the ostensibly sovereign voters at any given time that image of the candidate and the solution to present problems ...

> ... "which appear to them at the moment as the most desirable, however little they may also correspond to the principles or interests of society. It is as if the tricks of the demagogues, which still rest, so to speak, at the handicraft stage and rest on intuition and empathetic capacity, should be replaced by highly efficient methods of automated processes. In this connection it will be taken for granted that the great majority of voters have only rudimentary opinions on particular issues without much personal reflection and are in no way capable of judging whether a candidate really deserves the trust they place in him by their votes. The voter is manipulated like the consumer, whose freedom to purchase what he wants (to the extent that he possesses sufficient purchasing power) may indeed exist in a favorable individual case but this is only true to a very limited extent for consumers as a group."[21]

In other words, what was begun in advertising as the influencing of the ostensibly sovereign consumer, reaches its perfection in the manipulation of the sovereign electoral constituency by pseudodemocratic means. Of course these methods of mass domination are available to all parties (that is, in the USA, to both parties), just as advertising methods are also used by more than one company. Within certain limitations, Pollock shares the hope that a certain neutralization

of the influencing and a preservation of a sphere of freedom of choice for the individual -- even if limited -- can be preserved in this way. He emphasizes, however, and in our opinion correctly, that it is impossible "to overlook the dangers that it (i.e., the 'dominance machine') will finally be monopolized by a totalitarian group."

> "They would not then need a gifted propaganda minister in order to perpetuate their reign, but could achieve their momentary goals at home and perhaps even in foreign policy with exactly dosed, scientific methods and with a perfection that would place Orwell's world of 'Big Brother' in the shade."[22]

In our discussion of the problem of scientific abstraction and aggregation, we have in part treated the dehumanizing consequences of modern technology in relation to modern weapon systems. The progress of military technology, which makes possible the automatic annihilation of human beings over great distances by triggering electronically operated systems, represents in the first place a dehumanization of the human beings employed within the system. This results from the fact that with the capability of annihilating people at ever greater distances, the concrete events are felt all the more abstractly, and the ability to react to them with moral scruple is necessarily reduced. The zoologist Konrad Lorenz has treated this problem in a study of aggressivity in a way which is directly relevant for us:

> "The distance in which all shooting weapons take effect screens the killers against the stimulus situation which would otherwise activate his killing inhibitions. The deep, emotional layers of our personality simply do not register the fact that the crooking of a forefinger to release a shot tears the entrails of another man...The same principle applies to an even greater degree to the use of modern remote control weapons. The man who presses the releasing button is so completely screened against seeing, hearing or emotionally realizing the consequences of his action that he can commit it with impunity -- even if he is burdened with the power of imagination."[23]

We have dealt so extensively with the problem of modern technology, including the future consequences of automation, because we hold them to be of fundamental importance for the problem of the dehumanization of the social framework of life. In this connection it is not only a question of projections into the future. The problem of the dehumanization of social reality is a present problem. It is expressed largely in the already mentioned neglect of social benefits and social costs which stand outside the monetary and market calculations. In the monetary calculation and the principle of profitability, business possesses a system of relatively easily applicable criteria of action and choice and has as well, with its dictum "business is business," created a sovereign rule that morally eases and justifies the neglect of values and the interests of humanity external to the market. Social critics of the most diverse background have continually emphasized from time immemorial that a critical awareness of numerous human needs and social requirements is weakened and often lost as a result. This criticism, together with the extension of limited political democracy, has, at least to a certain degree, stopped the loss of critical awareness and counteracted the most obviously dehumanizing consequences of this economic calculation (for instance on the labor market) by protective labor and social legislation.

It can, however, be shown, in many other fields, that economic progress, particularly in economies with high growth rates, is still purchased with far-reaching losses and impairments of substance that represent a dehumanization of the human conditions of life. In this connection we would only refer to air and water pollution by modern industrial processes, to the chaotic development of large modern cities and industrial centers with their continually worsening living, traffic and transport conditions, and to the progressive destruction of the natural environment. From the standpoint of the formal principle of rationality these consequences seem to be inevitable and unavoidable. From the standpoint of a substantive principle of rationality, which judges the quality of the human framework of life in the light of the available economic and technical means and possibilities, these losses appear as avoidable and wasteful damage to human and social substance. Only someone who has become used to no longer regarding man as the measure

of all things can come to the conclusion that we must resign ourselves to this development and that no criteria can emerge from it for judging what would be necessary to do.

In conclusion, we turn to the consequences of modern advertising because the phenomenon which interests us here reveals itself in advertising in a particularly striking manner. Advertising as a method of influencing selling and the consumer is a component of present-day oligopolistic competition. As such it is, as an institution, also a consequence of technology. Under the pressure of constantly increasing productivity, brought about by technology and the forms of competition arising from it, production makes use of the methods of influencing the sales volume as well as the consumer in order to guarantee the exploitation and expansion of productive capacity. The dehumanizing influence that advertising exerts on the daily habits and even on the aims in life of human beings comes from the fact that it does not limit itself to providing information on prices and quality but extensively serves manipulative purposes.[24] This manipulation takes place by applying a highly developed technique utilizing psychological and psychiatric knowledge of human behavior to influence or to create the aims and needs of the consumer. For this purpose, use is made of all conceivable means, whose character and dehumanizing consequences no one has recognized more clearly than Thorstein Veblen:

> "The production of consumers by sales-publicity is evidently the same thing as a production of systematised illusions organised into serviceable 'action patterns' - serviceable, that is, for the use of the seller on whose account and for whose profit the customer is being produced. It follows therefore, that the technicians in charge of this work ... are ... experts and experimenters in applied psychology, with a workmanlike bent in the direction of what may be called creative psychiatry. Their day's work will necessarily run on the creative guidance of habit and bias, by recourse to shock effects, tropismatic reactions, animal orientation, forced movements, fixation of ideas, verbal intoxication. It is a trading on that range of human infirmities which

blossom in devout observances and bear fruit in the psychopathic wards."[25]

This appeal to the irrational elements of the human psyche and this "trading on the range of human weaknesses and infirmities," which has up to now reached its highest peak only in America, already represents per se a dehumanization of the social framework of life. The conscious fixation of ideas, the furtherance of prejudices, the propagation of half-truths and the stimulation of fear and shame, which are coupled with a loss of prestige, all this is a degradation of man to an object of economic and technical activity. The formal rationality of advertising should not delude us from the fact that it serves the gratification of needs whose urgency is not that of the consumer himself, but is determined or influenced by production. What the consumer receives may correspond to what he demands, but what he demands corresponds to what advertising or production has taught him to want. Advertising thus becomes the instrument of modern industrial society with the compulsive-neurotic consumer-type corresponding to it, who, in his manipulated, restless greediness, increasingly gives up all claim to the development and enhancement of his personality in favor of a higher standard of living "on installment credit." The fact that at the same time a considerable proportion of his fellow Americans has not participated in the improvement of the standard of living and that the majority of mankind can hardly satisfy their existential minimal needs is an additional element in the dehumanization of the social framework in the modern world.

IV. Conclusions

The results of this investigation can be briefly summarized as follows: the "loss of humanity" in theoretical inquiry is linked to a far-reaching dehumanization of the social framework of life in modern industrial society. Neither in science nor in society is man, with his needs, the central point of interest. We have tried to answer the question of how this has come about by pointing to the positivistic ideal in science, the splitting up of inquiry into a number of specialized sciences, the hypothesis of the behavior of economic man, the formal principle of rationality and the incomplete comprehension of reality by aggregation and average values. We have attributed the dehumanization of the social framework of life partly to the nature of the introduction and

application of modern technology and partly to the neglect of socially-damaging social costs and social benefits and to the methods of influencing markets and the consumer.

From this, it follows in the first instance that a humanization of the economic and social sciences, if it is possible at all, has to study the social and economic realities from a new perspective. Scientific progress has at all times consisted of the formulation of new questions. A new perspective follows from the loss of humanity of pure theory and the dehumanization of the social framework of life, as well as from the new results from modern natural science, including biology that are relevant for the social sciences. In place of the formal principle of rationality a new formulation of questions is required that makes possible the analysis and evaluation of social processes from the standpoint of the real interests of man and the requirements of society. Expressed differently, what would be necessary is a substantive and human formulation of questions making man the point of departure and the measure of social developments and institutions and at the same time placing him in the centre of economic and social prognosis and economic policy. What this means in detail is a question that has to remain reserved for a special study. We content ourselves here with some general remarks.

What is needed above all is a critical understanding and assimilation of the realities of social life following the decisive impacts of natural science and modern technology. What is particularly necessary is a scientific and empirically based concept of man and of human behavior. We believe that these elements are present today at least in their very beginnings in empirical anthropology and social psychology. In addition, certain basic needs of man can already be quantitatively expressed as rough estimates. If we would take this knowledge in the form of existential minimal needs as the starting point of our studies, we would already gain much or at least have made a start in the direction of the humanization of our formulation of questions, our concepts and our analyses.

Lastly, two further aspects deserve special emphasis. If the social sciences wish to keep pace with the rapidly progressing development of technology and to increase their practical relevance, then they have to let themselves be guided not only by the realities

of the past and of the present, but at the same time by the perspectives of the future. It will be necessary in this process to advance to the insight that the really urgent questions are no longer -- if they ever were -- purely economic or purely political, but are problems of an interdisciplinary nature. The wellbeing of humanity will depend to an increasing extent on non-economic factors and values. Only by taking them into consideration might it be possible to overcome the loss of humanity of which Salin spoke and to combine scientific knowledge and practical action in a way that will meet the requirements of the twentieth century.

References

1. Edgar Salin, "Hochkapitalismus," WWA, Bd. 25, 1927, reprinted in Edgar Salin, Lynkeus, Gestalten und Probleme aus Wirtschaft und Politik, J.C.B. Mohr, Tubingen, 1963, p. 184.

2. Edgar Salin, "Politische Ökonomie - Heute," Kyklos VIII, 1955, reprinted in Lynkeus, op. cit., p. 216.

3. We have attempted on another occasion to show that a system of social sciences has become possible with the aid of an empirically based concept of man and culture (in the sense of modern, empirical cultural anthropology). Cf. K. William Kapp, Toward a Science of Man in Society, The Hague, Martinus Nijhoff, 1961.

4. On the difficulties of differentiation of static and dynamic categories in social science cf. Th. W. Adorno, "Static and Dynamic as Sociological Categories," Diogenes, 1961, No. 33.

5. H. Becker, "Science, Culture and Society," Philosophy of Science, 1952, vol. 19, p. 278 et seq.

6. Th. W. Adorno, "Begriff der Soziologie" in Soziologische Exkurse, Institut für Sozialforschung (Ed.), Frankfurt/M, Europäische Verlagsanstalt, 1956, p. 18.

7. H. Ablert has again, and with particular force of conviction, shown that the mode of thinking of

positive economics utilizes different empty formulas that lead not only to the projection of an objective idealized relationship into social reality but also at the same time to a crypto-normative manner of observation. H. Albert, "Die Problematik der national-ökonomischen Perspektive," Zeitschr.f.d.ges.Staaswissensch. Vol. 117, 1961, p. 438 et seq. Cf. on this subject Th. Veblen, "The Limitations of Marginal Utility," Journal of Political Economy, vol. XVII, 1909, p. 620-636; Gunnar Myrdal, Das politische Element in der nationalökonomischen Doktrinbildung, Berlin, 1932.

8. Friedrich List, Werke (Schriften, Reden, Briefe), Vol. VII, Berlin, Reimar Hobbing, 1931, p. 501. List saw the importance of such a science of the future in the ability, starting from the experience of the past, of the 'nature of things,' of technology and of an appreciation of national characters, "in a certain way [to] lift the veil of the future with some certainty or at least with greater probability...with the aid of history, statistics and economics." Ibid. p. 485.

9. The already superseded discussion of the "Great Society" in America pointedly raises the problem with which we are here concerned:

> The Great Society "is a place where men are more concerned with the quality of their goals than the quantity of their goods ... In the next 40 years we must rebuild the entire urban United States. It is harder and harder to live the good life in American cities. There is the decay of the centers and the despoiling of the suburbs. There is not enough housing for our people or transportation for our traffic. Open land is vanishing and old landmarks are violated. Worst of all, expansion is eroding the precious and time-honored values of community with neighbors and communion with nature...
>
> A second place is our countryside. We have always prided ourselves on being...America the beautiful. Today that beauty is in danger. The water we drink, the food we eat, the very air we breathe are threatened with pollution. Our parks are overcrowded and our seashore overburdened. Green fields and dense forests are dissappearing

...today we must act to prevent an ugly America."

President L. B. Johnson's address to the students of the University of Michigan, quoted in Time, May 29, 1964.

10. Anatol Rapoport, "Tolstoi und Klausewitz - zwei Konfliktmodelle und ihre Abwandlungen," Atomzeitalter, September 1966, Nr. 9, p. 262.

11. Norbert Wiener, Gott und Golem, Inc., Dusseldorf, Econ Verlag, 1965, p. 87.

12. Erich Fromm, May Man Prevail? Garden City, NY, Doubleday & Co, 1961.

13. Oskar Kokoschka, Schriften 1970-1955, Munchen, Albert Langen, 1956, Cf. p. 396, 398, 410.

14. Jose Ortega y Gasset, The Dehumanization of Art, Garden City, NY, Doubleday & Co., 1956.

15. This statement is not actually limited to the economic theories dominated by the formal principle of rationality. Thus, a sociologist states for instance that sociology has "gone through a rapid development, but has thereby lost sight of the autonomous, whole man and his freedom. Sociology has paid for the exactitude of its assumptions with the humanity of its intentions and has become a thoroughly inhuman, amoral science." R. Dahrendorf, "Homo Soziologicus," Kölner Ztschr. f. Soziologie und Sozialpsychologie, 10. Jahrgang, 1958, p. 364.

16. "The machine seems to have drawn man to itself to cover its deficiencies. Then it dominates him completely and imposes its needs upon him. (Man) supplements without loss whatever human faculties the machine lacks, whatever imperfection hampers the machine in the satisfaction of its needs. If it lacks eyes, he sees for it; he walks for it, if it is without legs; and he pulls, drags, lifts, if it needs arms. All of these things are done by the factory worker at the pace set by the machine and under its direction and command." H. Marot, The Creative Impulse in Industry, New York, Dutton, 1918, pp. 4-5, cit. in Georges Friedman, Industrial Society - The Emergence of the Human Problems of Automation, The Free Press

of Glencoe, Paperback ed., 1964, p. 178.

17. We cannot and need not enter here into a detailed discussion of the inner logic of mechanization and its consequences for man. The great number of empirical and theoretical studies on this subject make this superfluous. Only the following works are mentioned here: Georges Friedman, Op. cit.; R. A. Brady, Organization, Automation and Society, Berkeley, University of California Press, 1963; F. H. Blum, Der Weg zur echten Betriebsgemeinschaft, Wien, A. S. Walter Verlag, 1955.

18. We mention here only the danger that the weakening of the trade unions would lead to an impairment of their "countervailing power" in respect of the distribution of the national product and the protecion of the worker in the face of the arbitrary decision-making power of impersonal bureaucracies. This function of the trade union is chiefly neglected in the literature of economics, but is of far-reaching importance for the life of the worker and his family.

19. M. V. Wilkes, "A World Dominated by Computers?" in The World in 1984, vol. 1, ed. Nigel Calder, Harmondsworth, Penguin Books Ltd., 1964, p. 149.

20. Friedrich Pollock, Automation, Frankfurt, Europäische Verlagsanstalt, 1964, p. 344.

21. Ibid. pp. 345-6.

22. Ibid. p. 347. Salin drew attention in 1957 to the danger of the strengthening of authoritarian state power by the machine. E. Salin, "Die neue Etappe der Industriellen Revolution," in H. W. Zimmermann (Hrsg.) Zur Ökonomie und Technik der Atomzeit, Tübingen 1957, pp. 156-7.

23. Konrad Lorenz, "Ecce Homo," Encounter, vol. XXVII, No. 3, September 1966, p. 27.

24. The theory of imperfect competition is clear about this fact without however drawing the full consequences from it: "...selling methods which play upon the buyer's susceptibilities, which use against him laws of psychology with which he is unfamiliar and therefore against which he cannot

defend himself, which frighten or flatter or disarm him -- all of these having nothing to do with his knowledge. They are not information; they are manipulative." E. Chamberlin, The Theory of Monopolistic Competition, Cambridge, Harvard Univ. Press, 1948, p. 119-120.

25. Thorstein Veblen, Absentee Ownership and Business Enterprise in Recent Times, New York, Viking Press, 1923, pp. 306/7.

CHAPTER V

ECONOMICS AND RATIONAL HUMANISM*

[In this chapter, Kapp extends his discussion of conceptual shortcomings in the social sciences, stressing particularly the historical developments that have created a widening gap. He suggests that the social sciences in general and economics in particular should start from a definition of their central purpose as one of protecting human existence from the manifest dangers that modern science and technology have created for it. He proposes that science and technology are by their nature qualified to derive social minima and limits of tolerance for the increasingly menacing dysfunctions in order to establish criteria and priorities for their alleviation. - J.E.U.]

I. Introduction

[In Chapter 4 of this volume] I dealt with the problem of dehumanization of economic theory and the dangers to humanity in a technical age. [It] was a critical presentation of this development, [but in this chapter] I would like in the main to analyze the modalities which could lead to a new humanization of our economic thinking. Such an attempt is based on the conviction that a general critique of dehumanization helps just as little as does the repeated proclamation of humanitarian intentions or an appeal to human values. I hope to demonstrate that a humanization of our economic and social theory is possible without getting lost in empty generalizations and verbal formulae.

II. Diagnosis

It is useful to summarize briefly the critical diagnosis of the factors which have led to the dehumanization referred to, that is, to the neglect of the human being and his concrete needs by our discipline. The reasons for this development can be shown from different perspectives. Thus, for example,

*Public inaugural lecture, held on June 8th, 1967 at the University of Basle, published in Kyklos Vol. XXI, No. 1, 1968, pp. 1-24. Translated by J. E. Ullmann and J. Cartwright.

the historical school of economics would explain the neglect of actual human needs by current theory as an inevitable consequence of the conscious concentration on the investigation of the functional relationships between a few variables. American and European institutionalism would look at the dehumanization of our economic thinking as the result of isolating so-called pure economic phenomena from their social context -- an isolation that stands in contradiction to the epistemological demands, for instance, of contextualism as propounded by John Dewey. On the other hand, the social and socialist critique of the 19th and 20th centuries would see the cause of the dehumanization of modern theory in the loss of a critical consciousness towards social reality and in the lack of that prescientific vision of a rational or a civilized society -- a vision which has decisively influenced the thinking of all great creative economists. From the viewpoint of critical rationalism it could be shown that the dehumanization of theoretical thinking is also to be traced to the fact that one consciously or unconsciously tries to protect theoretical results from the necessary confrontation with reality and to neutralize them against a possible refutation.

As long as the thinking of the social sciences was still formed by the classical preconceptions of antiquity, of the Middle Ages and by the teachings of natural law, the epistemological task was from the beginning so formulated that the answers by necessity led to norms for individual and social conduct. From the specific preconceptions of people as political beings and certain related viewpoints about moderate conduct and goodness, the philosophy of antiquity derived normative judgments in ethics, politics and economics. Classical humanism as well as the political and economic thinking in the philosophy of antiquity rest on this kind and formulation of questions which take man and his conduct as their point of departure.

This starting point in the consideration of economic problems was basically retained during the Middle Ages. True, the political question was replaced by a religious one and the drama of Christian teachings on salvation and the Christian ethic take the place of the political engagement of ancient philosophy. Man with his concrete profane and transcendental needs, as they were then understood, remains

thereby in the center of the debate on economic questions and facts. The rejection of a barter economy, the prohibition of usury (i.e. of interest) and conclusions about fair exchange relationships characterize the content of the theoretical, deductive thinking of the Schoolmen just as in antiquity. The secularized natural law of Grotius and of Pufendorf which still played a decisive part in forming classical economics constitutes no significant break in the thinking of the social sciences. Even the philosophy of the enlightenment and Bentham's utilitarianism still keep to the classical formulation of questions. Actual man (i.e. the individual) with his subjective feelings of "pleasure" and "pain" remains the measurement of all things, not only in the sphere of moral political conduct, but also and in particular in the economic calculation of the maximization of benefit and of human happiness.[1]

Only with the impact of the positivistic scientific ideal on the social sciences during the 19th century does the relationship with the thought of antiquity and the Middle Ages get lost. Positivism believes that it can limit itself to the explanation of factual realities. In the natural sciences, positivism sees the prototype as well as the aim of scientific statements in the logic of mathematics and in the precision of mathematical equations. In order to follow the scientific ideal at least in part, economics required a range of explicit and implicit simplifications which today definitively determine its theoretical concepts, particularly in positive economics. Of these methods only the most important are listed here: The comprehension of economic processes as closed systems, i.e. outside their social context; the systematic separation of economic and non-economic factors; the differentiation of statics and dynamics; the far-reaching restriction of theoretical analyses to relations between ostensibly constant or regularly continuing relations of scale with far-reaching neglect of continuous cumulative changes; the inclination to see tendencies of equilibrium derived from the static method of observation as regularities of behavior and the equilibrium itself as a norm; the employment of simplifying hypotheses of conduct such as that of profit and benefit maximization; the assumption of a complete knowledge of market conditions within the model of perfect competition; the simplification of data by aggregation -- these are only the most important methods and procedures of con-

temporary theoretical conceptions with the help of which the desired objective of precision of theoretical statements has been successfully reached. However, this precision has in part been obtained quite consciously by a withdrawal from concrete reality and from concrete human needs as well as from social exigencies. Neither in the modern theoretical formulation of questions which the economic process regards as being within a static framework of scarcity of given means for given objectives, nor in macroeconomic forecasting, does the satisfaction of concrete human needs stand in the center of our interest. A critical perspective of business and society which still plays an important role in Keynes' work fades ever more into the background. A critical awareness of the limited importance of one's own specialized knowledge for a relevant judgment of social reality is becoming steadily rarer. Economics is at the point of becoming pure technique which reacts essentially only to externally posed questions and hardly feels the need to relate its one-sided results to the knowledge and the experience outside the discipline. In this respect the expert on economics resembles the one who calculates rocket trajectories or, on the basis of calculated losses in human life, wishes to participate in strategic decisions, or the sociologist who works to develop techniques for influencing public opinion or increasing sales.[2]

Yet it can in no way be claimed that this voluntary self-restraint on the part of economic inquiry has led to uniform and generally accepted results. In contrast to the natural sciences in economics today, there is hardly a stock of generally binding scientific statements that do not call for contradiction. Of course, there is agreement that it is not possible to do without statistics and mathematics but there is no clear agreement on how far the usefulness and the area of application of these auxiliary sciences extend. This is also the case in the question of whether and to what extent economic analysis may neglect the findings of psychology, sociology and other social sciences. Here too there is hardly any agreement. In our own discipline, the statement like that by the [1967] president of the American Economic Association, K. E. Boulding should cause earnest reflection: "The whole economics profession, indeed, is an example of that monumental misallocation of intellectual resources which is one

of the most striking phenomena of our times."[3] Despite every advance in our scientific knowledge we have not progressed beyond the point in our own discipline which the famous Swedish economist Knut Wicksell in his inaugural lecture at the University of Lund over 60 years ago characterized as follows: "Economic theory has, exactly like theology and for approximately the same reasons -- not succeeded in reaching generally accepted conclusions."[4]

Wicksell's critical remarks about the situation of economics at that time were related to the classical theory of labor value which in the hands of the socialists and particularly of Robertus and Marx had in his opinion become a terrible weapon against the existing economic order.[5] As a neo-classicist, he was of the opinion that a successful economic theory presupposed above all the measurement of benefit.

Since Wicksell, economists have, in our opinion, worked in vain on the solution of this task, because the subjective experience of benefit (that is the relationship between the individual and scarce goods) is not uniformly measurable, quite apart from the contradictions in which one gets entangled when attempts are made to carry out interpersonal and intertemporal measurements of benefit. The currently popular methods of benefit comparison between two goods, by means of "indifference curves" are not measurements of benefit but evade the problem by assuming that with a given income and with given preferences, an individual views as equal certain combinations of two goods. We cannot therefore speak of a measurement of benefit. In this sense the problem of the measurements of benefit raised by Wicksell has found no satisfactory solution up to now.

III. Rational Humanism

There is no lack of attempts today to achieve a humanization of our thinking by a return to the starting points of earlier humanisms and to seek the modalities for a reorientation of the social sciences either in Greek philosophy or in the Christian ethic. Even if the value of such endeavors cannot be readily denied, it still seems doubtful to me whether these attempts can do justice to contemporary problems. It is clear above all that the societies of the 20th century are neither Greek and Italian city states nor medieval societies held together by aristocratic

elites or by the ties of a common belief. Further, the citizens of modern industrial nations and of the preindustrial traditional societies of today's underdeveloped world are faced with problems radically different from those of antiquity and the Middle Ages.

Even more significant is the fact that we are separated from antiquity and the Middle Ages by the caesura of modern science and the technology that has developed from it. The humanism of the Renaissance, beginning in Italy and England and finding an appreciative response in Basle at the beginning of the 16th century, reached its climax before the development of scientific thinking and the achievements of technology whose dynamics today determine not only our economic and social problems but also increasingly our international ones.

Neither should we overlook that a humanism oriented to the world views and values of one epoch or one culture is in danger of falling into ethnocentrism and thereby into an exclusiveness that could rapidly lead it ad absurdum if not directly into inhumanity.[6] There are, of course, points of contact between ways of looking at the world and world religions but at the same time there remain important differences and often even unbridgeable gaps. As shown by our experience with the misuse of power by totalitarian states, an aristocratic or authoritarian society that confers special rights to certain elites is the antithesis of rational humanism. In this sense one really must accept the humanistic starting point of classical economics and utilitarianism without seeing the final answer or even the solution to our problems in classical economic liberalism or in contemporary utilitaristic welfare criteria.

Faced with such considerations, the question must be asked how we can attain a humanization of our thinking in the social sciences. It seems to me that a humanism relevant for the social sciences would have to fulfill two conditions: It has to orient itself both to the social reality of a technical age and to make the methods of thought of modern science its own. For this a new humanism is required that takes as the starting point of its inquiry the difficulties of the human situation as they clearly stand out today and in the foreseeable future, and at the same time revises its conclusions in the light of new scientific knowledge and leaves them open to refutation by

empirical data. Only such a rational humanism would fulfill the demands placed upon the social sciences by contemporary technical economic and social dynamics. This would specifically mean that the humanization of thinking in the social sciences has to begin from a completely novel situation, a situation in which science and technology affect the questions of the mastery of human existence and the preservation of life. In the age of modern technology, man is the endangered species par excellence and in a much more fundamental sense than was previously the case and previously realized.

IV. The Dangers to Humanity

For more than 20 years modern empirical anthropology, which had its beginnings in biology, has focused its attention on the growing endangerment of humanity.[7] Anthropology has significantly contributed to the viewpoint that we should now regard man as a new biological variant, the danger to whom lies in the first instance in very specific biological disabilities at birth. It has shown, at the same time, that precisely these disabilities are the precondition for the development of special and specific human capabilities and potentialities for the mastering of existence and for the preservation of life. What the new anthropology has not perhaps shown us in its full potential, and this was also not its task, is the self-impairment of man by his own cultural achievements which also include -- in terms of modern cultural anthropology -- science and technology. And precisely this self-impairment belongs to the problems and factual realities which make a reorientation of the social sciences essential.

The self-impairment of man is shown in modern industrial societies by various kinds of social costs, that is by stresses and by the infliction of damage through production, of which I only mention as examples the pollution of air and water and the results of the destruction of the natural equilibrium.[8] Social costs of this and of other kinds can also be seen in the underdeveloped countries.[9] In these countries, in which today two-thirds of the world's population live, the endangering of man further appears in an even more dramatic form, i.e. in that these traditional societies and economic systems can no longer supply their rapidly growing populations with food and raw materials. The population increase

which has for some time threatened to get out of hand and become a population avalanche ... is for its part the result of the application of a largely imported medical technology for overcoming sickness and mortality. But this happened without these countries succeeding, up to now, in adjusting their traditional positive attitude to childbirth to the reduced mortality rates or, alternatively, to begin the technical modernization of agricultural production and the reform of their obsolete agrarian structures. As a result of this complex situation, millions of people are today not only undernourished but threatened by starvation.[10] Estimates by responsible research institutes indicate that half of humanity is underfed and that with today's rates of population growth, a 41 percent increase in the world production of food will be necessary by 1975, just to maintain the food situation at today's insufficient level. In other words, malnutrition, sickness and hunger are the indicators of the conditions of existence of a growing sector of the world's population.

A third source of danger must be added to social costs and the increase in population in traditional societies, a source which also has its origin in modern science and technology. It is the development of nuclear energy and its use for peaceful purposes as well as its possible application in a thermonuclear war. Here we are talking about dangers whose extent is already foreseen, whose avoidance, however, places before us previously unsolved problems. The potential damage to human health from the emission of radioactivity as well as the possible annihilation of millions of people are shown today with terrifying clarity by the aftereffects of the destruction of Hiroshima and Nagasaki. The intermediate report by the mixed commission of inquiry on the surviving victims of the cities destroyed by the atomic bombs in 1967, shows that the incidence of leukemia among survivors in a radius of 2 kms is about 10 to 13 times higher than the Japanese average. Increased frequencies of thyroid cancer has also been confirmed, particularly among women.[11] With impairment of genetic substance by the acceleration of radiation-induced mutations, it appears that the available scientific research reports do not yet allow any quantitative statements to be made. One conclusion does, however, appear to be justified: Positively valued mutations in humans are relatively rare and the selection of vital genetic mutations plays a minor role in

contrast to the socio-cultural process of selection; then every acceleration in the rate of viable mutations would bring us directly to the brink of inhumanity and crime, because, as Portmann says, we would have to summon up the fanatical will "to call forth monsters and human degradations which we would then again have to eliminate ruthlessly in a process of real natural selection that favors the much rarer productive mutations."[12]

This impairment of man would reach its climax in the use of thermonuclear weapons in the case of a nuclear war, which would not only destroy millions of human beings but also make whole peoples and perhaps a considerable part of humanity the victims of radioactive fallout. Similar dangers follow from the use of chemical and biological weapons, for whose development today considerable preparations are being made. It is therefore no exaggeration to say that the preservation of life of a large part of humanity depends on a political equilibrium of mutual deterrence whose lability resembles that of a tightrope-walker. In this sense as well has man today become a self-endangering being.

This endangerment of man is on the other hand faced with the fact that the avoidance of social costs, the preservation of life and the mastering of existence in general, as well as the protection from radioactive fallout all require the control of modern science and technology. In fact, science and technology are at one and the same time the causes of human impairment and the preconditions for shaping human existence and preserving life in the foreseeable future. This two-sidedness of modern science and technology shows the qualitative novelty of man's social situation at the end of the twentieth century.

As topical as questions of unemployment, unequal distribution of income, the exploitation and misuse of economic hegemony may all be, humanity is today faced with the even more fundamental question of the danger it presents to itself. This new aspect of the human situation determines the formulation of the problems and the tasks for a new humanism and the social sciences.

V. Paths to Humanization

In an age of an acute danger to humanity, a

rational humanism is needed that takes as its starting point the central problem of shaping human existence and the preservation of life and makes them the subject of its value orientations. Negatively formulated, this means that in the first instance we should not fall into an attitude which rejects science and technology. The problems and dangers that are our subject here cannot be overcome without science and technology. Enmity towards science and a rejection of technology would seal the fate of millions living today just as much as would a war with thermonuclear, chemical or biological weapons. In this sense there can be no return to a pre-scientific age.

We also cannot do justice to the problems of shaping our existence and preserving life by means of a formal solution as exemplified by the principle of rationality in theoretical economics. A formal theory based on the assumption that man maximizes something and then labels this something as benefit, basically leaves the aims of the activity entirely undetermined.[13] In other words, the criteria of rationality in a new humanism have to be of a substantive nature, that is, they have to be sought and found in the degree to which they guarantee concrete conditions of life or satisfy basic existential needs. Concrete and relatively constant measures of basic needs or minimal limits of tolerance have to take the place of value functions with undetermined content.

Minimal limits of toleration are maximum limits of stress for human beings, based on empirically verifiable criteria and as such subject to scientific determination. Quantitative measurement standards of this type are known today in the form of limits of tolerable air and water pollution, radioactivity in the atmosphere, acceptable concentrations of chemicals for the preservation of foods which can be dangerous to health, etc. Further, in the field of human nutrition considerable progress has been made in that we can now determine the minimal requirements in quantity and quality of different nutrients for various kinds of work and environment. We are also working today on the preparation of empirically verifiable indicators of the stress or overstraining of human beings in the fields of housing, transport and health services as well as in living conditions in the large cities.

This enumeration neither exhausts the fields of application for such limits of toleration nor does it

touch the many open questions which such an analytical instrument poses for economics. In particular, we are not interested here in the operational questions of the measurement of minimal limits of toleration or their relative precision. These are technical problems which can in any case only be solved through close cooperation between the social and the natural sciences (including medical research). What is much more important is the fact that the elaboration of such minimal tolerance levels for various areas of human existence is with present knowledge no longer difficult in principle and that such measurements could be made in real or physical terms.[14] We should perhaps note there that in these matters the adage is valid that less precise answers to important questions are of greater relevance than precise answers to unimportant or wrong questions.[15]

The fundamental question of the importance of such tolerance limits as an analytical instrument for economics remains much more in the center of our interest. What contribution can they make to determine the setting of objectives of human action and of politics? To what extent would they humanize social and scientific thinking? And what would be their epistemological implications for our discipline?

We should emphasize to begin with that minimal limits of toleration are no measurement for optimal living conditions, for two reasons: first, they encompass only a part of human needs and second, they are minimal limits in relation to these needs. At most, they represent conditions worth striving for insofar as their neglect or infringement would mean a real danger to people. They can however be valid as direct measures of these dangers and therefore directly serve as criteria for judging human activities and technical progress. They are indicators (or inhibitors) that impart to us not only a conception of the present state of affairs but also for the first time the necessary objective information on the possible consequences of our decisions.

As their name implies, these indicators constitute average minimal limits whose infringement is not possible without grave consequences for the securing of human existence and the preserving of life. In this specific and, fundamentally, relatively modest sense one can call such tolerance limits real minimal requirements of human life, that is, of existential

human needs. One can view them as minimal demands which have to be fulfilled in a technical world and provide us with a standard for the degree of fulfillment (or non-fulfillment) of real basic needs. It seems at least as important to me that for the first time such standards would provide a means, albeit a modest one, for making a distinction between what is important and necessary and what is less important or perhaps superfluous -- a distinction which those living in surplus societies are steadily less ready and able to make as they are less and less often exposed to it. However, exactly this distinction, which the social sciences have up to now understandably avoided, is necessary for the formulation of a substantive principle of rationality in face of the dangers to humanity in a technical age. It is somewhat more difficult to answer the question of the importance of existential basic needs for the clarification and determination of objectives in practical action and politics. The fact that minimal requirements for human life can be objectively determined does not apparently make them automatically the objectives of human activity. Data on even elementary basic needs do not themselves constitute objectives, they remain data and neither in consumption nor in production define the objectives of human behavior. For the determination of the objectives of social and human activities a consensus or agreement is always needed on what has to be done.

We thus come to an objection to the use of minimal limits of toleration which sees in their use a danger of regimentation of society. Although we should not overlook this danger it should not be seen and judged abstractly but in the context of an alternative to the real dangers to modern man. Those who reject traffic control on the grounds of regimentation still have to give an answer to the problems of rising traffic chaos and the dangers of death on the roads. But the answer to the previously mentioned objection can be formulated more fundamentally: The use of minimal toleration limits does not alter in any way the necessity of making choices because the problem of scarcity remains. It is still just as necessary to find agreement on the relative importance of different objectives and the degree of their satisfaction. It seems to me unrealistic to believe that we shall in the foreseeable future overcome the necessity of choices and of finding areas of agreement. Under democratic conditions such agreements are made by

compromises that are acceptable and therefore workable without necessarily conforming to all the criteria of rational action (consistency and transitivity of the choice of objectives and the appropriateness of the adopted courses). In this acceptance of objectives and their workability lies another aspect of their humanity. It is thus not correct to believe that a rational humanism has to become, either itself or through the influence it could exert on economics, a science standing above the sciences or an illegitimate lawgiver.

We now come to the question of the practical importance of tolerance limits as an analytical instrument. The elaboration of such minimal limits facilitates the necessary knowledge which would allow us to comprehend and to assess the positive and negative effects of our activities, including inaction. The device of minimal limits would therefore make it possible to estimate and compare the consequences of alternative decisions. Though they do not automatically determine the objectives of our activities, they are still an unconditional prerequisite for a rational clarification and choice of objectives. In other words, they make a contribution both to the determination of objectives and to the establishment of social priorities. We orient this choice of objectives towards the preservation of life and mastery of existence to the extent that this process is based on scientific empirically-based existential needs. In short, we humanize the choice of objectives and provide the planning process with a rational basis. Let us just imagine what sacrifices and failures would have been avoided if we had geared the choice of objectives and the economic planning process in both industrialized and developing countries to existential basic needs.

The final and most important question in this connection relates to the implications of using minimal limits of tolerance for the tasks of the economics of the future. Economic theory would acknowledge the criterion of the satisfaction of basic human needs as the objective and standard of economic activity, instead of using criteria of benefit of undetermined content, for which today an abstract monetary amount serves as the indirect standard -- a procedure which can only offer a formal solution to the problem of benefit measurement -- and instead of the criteria of global growth, which are also at present incompletely

known. This would have as a consequence a radical reorientation and extension of the tasks of political economy. Whereas up to now concrete basic needs have only been discussed peripherally, for example in connection with problems of social insurance, tax burdens, and the distribution of income, they would now become the starting point and the centre of economic thought and policies.[16] Rational setting and achievement of objectives would thereby be brought within the scope of a science of behavior and of political practice. In this sense the instrumental elaboration of the paths to be followed, the choice of means in its broadest sense, both belong to the rational setting of objectives and their rational achievement, i.e. rational in the light of empirically testable criteria. This choice of means includes the choice of technologies and the social reforms conforming to the objectives being aimed at. The following example may illustrate these conclusions. The solution of the problems of food scarcity and famine in preindustrial societies with a rate of population increase of 2.5 - 4 percent is at one and the same time a matter of developing new technology, its application in traditional peasant economies, and the reform of handed-down conditions of ownership, rent structures and power. This new technology has to overcome the stagnation of agricultural rates of yield and offer the farmer practical opportunities and thereby rational incentives, for improvements in production and productivity. For this purpose, there has to be development of new agricultural capital goods (such as new strains of rice, maize and wheat), suitable for the specific climatic and soil conditions of tropical developing countries.[17] This agricultural technology would have to be labor-intensive, because capital-intensive solutions of the problem of proportioning the production factors would only aggravate the so-called agricultural "underemployment." The problem is further complicated by the fact that the new technology has to be applied to a large extent by tradition-oriented people whose knowledge and abilities are restricted by traditional agricultural methods. The development economist who is occupied with these and similar questions is thus faced with problems that go beyond the traditional limits of economics.

Such an inclusion of institutional and technical factors and their conscious influence would differ from the previous methods of our science in that the

very factors which economic theory takes as given or constant - such as human behavior, technology and institutions - will become unknowns or variables that have to be determined or changed. In short, the threats to human existence lead not only to a necessity of determining man's basic existential needs but also the exploration of means, including changes in the institutional and technical environment. The logic of the determination of objectives is added to the logic of the achievement of objectives by the introduction of means suited to the objectives. When political economics is oriented towards the preservation of life and providing the means of existence, its tasks transcend a preoccupation with the optimal employment of given scarce means with given objectives in competition with each other; it includes the exploration of what is necessary and possible and, in the form of political action, deals at the same time with the question of how appropriate reforms may be used to realize sets of objectives that have been recognized as necessary and found social acceptance. It need only be mentioned briefly that this new orientation of economic theory above all raises new questions for the field of interdisciplinary cooperation. In my opinion this creates intellectual tasks of the highest practical and theoretical import which have already been recognized by a few, but even fewer have worked on them. They belong to the unsolved tasks facing the social sciences whose contemporary compartmentalization, as sanctioned by the traditional boundaries between academic departments, impedes their intellectual development.

VI. SUMMARY AND CONCLUSIONS

We have tried to show that the dehumanization of economic theory is most closely connected with certain methods in our discipline that are deeply anchored in contemporary positivistic scientific thought. This dehumanization reveals itself in both microeconomic and macroeconomic theory. The first operates with a theory of benefit maximization that starts out from the fiction that the aims and objectives -- expenditure and results -- of economic activity are not only given but also known. This methodology of economics usually takes the position that human behavior is explicable by given preferences and derives or deduces these preferences in their turn from the behavior. It is now, however, understood that the maximization theorem is an empty formula with no empirical force

which is compatible with types of behavior and cannot be disproved on the basis of any kind of behavior.[18]

Such a purely formal theory, that cannot be disproved, is in danger of trivializing its assertions. Viewing the problem of human action in a purely formal manner evades the question of what is to be maximized. In other words, the contemporary theory of economic behavior ignores the problems of securing human existence and the preservation of human life in a technical age.

Macroeconomic theory also suffers from a similar formalism. To be sure, it facilitates insights into certain general economic relationships, which, before Keynes, were only to be found among some outsiders within the profession. However, under the cloak of its global analyses and aggregation methods, it is possible to hide serious burdens and dangers as well as unemployment and poverty which represent an impairment of the quality of the social framework of life for millions of people. Further, the measurement of national income by no means corresponds to the requirements of precision which a political viewpoint would impose.

The humanization of economics and the social sciences demands above all the formulation of questions that start with the problems of the present day and are in a position to draw relevant conclusions from factual reality. We need for this in the first instance a scientific and as far as possible quantifiable analysis of the particular situation of humanity and society in a technical age. If we want to make statements about the rationality of human activity or economic order then we need first of all empirically verifiable criteria and relatively constant indicators upon which we can reach agreement and therefore also change at any time. Such criteria stand beyond ideological and culturally specific distinctions, from which I do not infer that they should be the same for all times, all places and all levels of economic development.

We have tried to show that such indicators exist in the form of minimal limits of toleration or elementary basic needs which can be set up in the light of scientific knowledge and have already been elaborated for many fields. If these minimal limits of toleration are exceeded then the evidence of the

threat to human life is given. Such minimal standards, open to scientific verification, provide us with the necessary information on the real conditions of life and the material preconditions for the preservation of human life. They offer us the first points of application for the present distinction, mostly disregarded, between what is important and what is less important. Minimal limits of toleration can therefore be valid as direct standards for the measurement of the improvement or decline in the prerequisites of human life. They represent ordinal standards of benefit, which, in contrast to the standard of money, are direct in nature. As such they not only allow an objective inventory of the present situation but also make possible a relatively more precise anticipation of the effects and side-effects of our actions. However, they are no more than incremental standards which can show us whether and to what degree we are in a position to improve step by step the human and social situation. We believe that in this way our science could be placed on a more solid and more human basis, more so than is the case by the application of a formal principle of rationality and global measurements. Not only would we overcome the abovementioned withdrawal from the real conditions of human life but would place the elementary basic needs of human beings at the center of scientific debate and make them a starting point for decision-making that transcends questions of creeds and ideologies and doctrinary conformism. It should be emphasized again and again that this goes much further than the fulfillment of elementary nutritional needs, particularly in relation to those thinkers who either do not accept the full extent of our own human contribution to the threat to human survival, or who see in the measures needed to preserve humanity a danger of a manipulated society or a society of parasites. It is not only a matter of the survival of a specific biological species but the creation of preconditions for the transformation of human beings from objects of economic activity to personal beings, from a thing to a person. Apart from the fulfillment of elementary conditions for man's physical health, this requires at the same time the maintenance of his psychosomatic equilibrium and the acquisition of the ability to shape his own life.[19] But there is another reason why the preservation of life and the mastering of existence should not be identified with biological survival. The adaptability of man goes so far that human qualities and values can thereby be destroyed.

As a biological entity man adapts himself to almost every environment which does not physically destroy him. He adapts himself to work and living conditions that make either too great or too small demands upon him. There is hardly a condition to which man does not passively submit if he cannot escape it. But he pays the price for this adaptation with his physical and mental health. For this reason too we need objective, empirically verifiable criteria of minimal requirements for human life.

The ethic that a nation or the members of a religious community have as their focus becomes inadequate when the preservation of human life is endangered.[20] Due to the radical changes in the conditions and consequences of our actions, a new ethic is, in fact, required, which takes into account the scientific knowledge of our time and accepts the basic fact of the danger to humanity in a technical age. The new ethical imperative plainly has to make the preservation of the human species its starting point. From this aspect, a critical, rational social science can consider itself fully in consonance with the thinkers and religious systems that have all along taken man as the measure of all things. Such a rational humanism would indeed be suitable for facilitating a new perspective and relevant criteria for a new substantive rationality of action in economics and the social sciences. The scientific formulation of questions in a technical age does not result from the criteria of formal rationality of neoclassical theory but from the effective facts of human life. The question which has to be answered is the question of humanization, of the creation of institutions and technologies with whose help man can build an environment that takes into account his requirements and potentials. It is in no way certain that the present social sciences are in a position to carry out the new orientation. All that is certain is that scientific systems are only relevant as long as their inquiry and perspectives change in the light of new problems, new knowledge and new conclusions and are adapted to the requirements of their time.

Thus I return again to my earlier statement that the caesura of modern science and technology separates us from the humanisms of antiquity and the Middle Ages. I do not want to conclude these remarks without going into those elements of humanism of the Renaissance which still seem to me of enduring rele-

vance to a modern social science, despite their prescientific beginnings. Anyone who engages anew in the study of that great European movement of the intellect from the perspective of a long-standing concern with some preindustrial cultures of Asia, is impressed above all by the fact that this new humanistic movement was much more than a rediscovery of classical culture and classical art. Of course, the Renaissance was not about the discovery of what we today call science or the scientific method. But the rejection of traditional modes of thought, the criticism of the empty formulas of the scholasticism of the time, as well as the return to the sources -- this feeling for the relevance of history and the historical method -- all these must be recognized as elements of a scientific position. Further, the critical consciousness of a Thomas Moore and an Erasmus with respect to the social conditions of their time and the conviction that reason and science (of their time, of course) could lead humanity to a better life, seems to me to belong here. All this was already to be found among some Italian humanists[21] and is clearly revealed among some of the great Englishmen influenced by Erasmus. We find elements of a rational humanism among these humanists that does not adapt itself uncritically to the realities of the age. To the contrary, the problems which Moore and Erasmus confronted were those of getting beyond the empty formulas of the Schoolmen, of the brutalisation of man by warfare and of the preservation of peace. Their increasing disillusionment with Henry VIII, whom they had earlier praised as a humanistic prince, originates in the fact that this ruler, like many after him, passed himself off as a man of peace, and used this deception to veil his plans of conquest.[22] But despite all disillusionments, Erasmus does not withdraw into a pessimistic nihilism nor does he react with the thesis that inhumanity in man and in society show the existence of original sin. That Erasmus did not fall back on this concept of original sin or of evil in man, both of which must have been obvious to him, but rather on folly which reason might cure, seems to me a further proof of the relationships between a rational humanism and the humanism of the great Dutchman who became almost an Englishman before he found his peace in Basle.

FOOTNOTES

1. What is new in utilitarianism is not the preoccupation with the individual but the problematical claim of the measurability of feelings of happiness and benefit.

2. Anatol Rapoport, "Neue Linke und Machtelite," Atomzeitalter, No. 1/2, 1967, p. 30.

3. K. E. Boulding, "The Economics of Knowledge and the Knowledge of Economics," American Economic Review, Papers and Proceedings, Vol. LVI, May 1966, No. 2, p. 12.

4. Knut Wicksell, Economisk Tidskrift 1904. Vgl. Gunnar Myrdal, The Social Sciences and Their Impact on Society, September 1966 (mimeographed).

5. Knut Wicksell, Vorlesungen über Nationalökonomie, Jena, 1913, p. 76.

6. Thus a humanism which is guided by the cultural ideal of antiquity or wraps itself in an aesthetic cloak and stands aloof from the concrete problems of human existence, is no longer capable of doing justice to today's problems.

7. cf. Kurt Goldstein, Human Nature, 1940; Otto Storch, Die Sonderstellung des Menschen in Lebensabspiel und Vererbung, 1948; Arnold Gehlen, Der Mensch - seine Natur und seine Stellung in der Welt, 1950; Arnold Gehlen, Anthropologische Forschung, 1961; Adolf Portmann, Aufbruch der Lebensforschung, 1965; Rene Dubos, Man Adapting, 1965. A treatment of the importance of this research for a possible synthesis of the social sciences can be found in K. William Kapp, Toward a Science of Man in Society, 1961.

8. I only note in passing that social costs are also shown in certain psycho-pathological effects of contemporary life.

9. K. William Kapp, "Social Costs in Economic Development," in: G. P. Sicat (et al.), Economics and Development, University of the Philippines Press, Quezon City 1965, and Christin Uhlig, Das Problem der Social costs in der Entwicklungspolitik, Stuttgart 1966.

10. India is only the best known example of these countries. At the beginning of 1967, the Brazilian Archbishop Helder Camara declared that half of the autopsies carried out daily in the hospitals of the city of Recife, are done on children who are victims of starvation.

11. United States Academy of Science, January 1967; survivors in a radius of ca. 1400 m showed an 11 to 12 times higher mortality than the people further away during the years 1950 - 1960. The incidence of microcephalitis and mental retardation among unborn children exposed to radiation was also uncommonly high.

12. Adolf Portmann, Naturforschung und Humanismus, Basel 1960, p. 42-43.

13. Anatol Rapoport, Strategy and Conscience, New York, 1964, p. 20.

14. A. Keys, The biology of human starvation 1950; F. Perrous, "Note sur les couts de l'homme," Economie appliquée, No. 1, 1952; F. Perroux, Feindliche Koexistenz, Stuttgart, 1961; Organisation mondiale de la santé (WHO), "Malnutrition et maladie," Geneva 1963; B. M. Gross, The State of the Nation, Social Systems Accounting, London 1966.

15. Peter Wiles, The Political Economy of Communism, Cambridge, Mass. 1962, p. 246-247.

16. This demand would at the same time satisfy the condition that, in the formulation of their research tasks, the social sciences should proceed from explicit value premises in both the establishment of facts and the comprehension of relationships between variables, because the so-called effective facts can be differently expressed -- according to the perspective and value premises from which one approaches them. "Things look different depending on where you stand," Gunnar Myrdal, Address, ADA Meeting, April 1, 1967 (mimeographed).

17. The systematic development of a new technology through the creation of new agricultural capital goods, which is today taking place in different research institutions, seems to be one of the

most important prerequisites for the solution of the problem of world hunger. It is based on the recognition of the close relationship between technology and world nutrition in general and the industrial character of all successful agriculture in today's underdeveloped countries. Cf. Rockefeller Foundation, President's Review 1966, New York, 1966, p. 3-12.

18. Paul A. Samuelson, Foundations of Economic Analysis, Cambridge, 1948, p. 91-92.

19. François Perroux, Feindliche Koexistenz, Stuttgart 1961, p. 565.

20. J. Fourastie, "Essaie de morale prospective," 1967 and Brock Chisholm, in Man and His Future; W. Gordon (Ed), Ciba Foundation Symposium, London 1963, p. 317.

21. Friedrich Engel-Janois, Soziale Probleme der Renaissance, Stuttgart 1924.

22. Robert P. Adams, The better part of valor: Moore, Erasmus, Colet and Vives on Humanism, War and Peace, 1496-1535, Seattle 1962, p. 170.

CHAPTER 6

THE NATURE AND SIGNIFICANCE OF INSTITUTIONAL ECONOMICS

SUMMARY

Critics of traditional economic theory have always denied the closed character of economic systems. They have stressed instead the open character of economic processes and have challenged above all the belief in their self-regulatory tendencies. They have rejected the belief in the dogma of the 'mechanics of self interest' and the conviction that specialism is the royal road to efficiency in scientific analysis as well as in production. However, institutional economists have not only provided a rational critique of the traditional scope and method of mainstream economics; they have advanced an analytical framework for the explication of the circular interdependencies within a process of cumulative causation – a framework which gives them a powerful tool not only for the ordering of relevant factors in the analysis of socio-economic processes but also for the formulation and 'solution' of theoretical and practical problems. As such MYRDAL's principle of circular interdependencies can be regarded a new paradigm for a new approach to socio-economic analysis. Institutional economics aims at a normative system of knowledge which calls for explicit value premises of a preliminary and hypothetical nature. Instead of the vague utilitarian principle of maximizing 'pleasure' the author regards the satisfaction of basic human needs and the minimization of human suffering as the first moral principle and at the same time as a yardstick of social rationality which he considers as urgently needed in an era of environmental disruption and national and international socio-economic disorganization.

* * *

'I see the tasks of social sciences to discover what kinds of order actually do exist in the whole range of the behavior of human beings; what kind of functional relationships between different parts of culture exist in space and over time, and what functionally more useful kinds of order can be created.' R. S. LYND, *Knowledge for What?*, 1939, pp. 125/126.

'The failure of the social sciences to think through and to integrate their several responsibilities for the common problem of relating the analysis of parts to the analysis of the whole constitutes one of the major lags crippling their utility as human tools of knowledge ...', *Ibid.*, p. 15.

I. INTRODUCTION

ROBERT LYND's critical diagnosis of the crippling situation of the social sciences in the thirties was echoed later by SCHUMPETER's statement that the social sciences have steadily grown apart 'until by now the modal economist and the modal sociologist know little and care less about what the other does, each preferring to use, respectively,

a primitive sociology and a primitive economics of his own to accepting one anothers' professional results – a state of things that was and is not improved by mutual vituperation'[1].

In fact, neo-classical[2] economics has tended increasingly to develop into a self-contained body of knowledge which has become more and more isolated from other social sciences and analytical systems. This has been brought about by the influence of several inter-related tendencies and orientations which cannot be examined here as thoroughly as would be desirable. No doubt, the mathematization and formalization of economic theory have played a predominant role. So has a methodological individualism which can be traced back to the origins of our discipline. Equally important is the long tradition of reasoning by analogy to mechanics and the related search for levels of stable equilibrium, as well as the implicitly normative insistence that economic theory is concerned with the explication of the logic of rational action under conditions of scarcity or, as LIONEL ROBBINS, following Ph. WICKSTEED, put it, with a particular type or 'form' of human conduct: the study of 'human behavior as a relationship between ends and means which have alternative uses'[3].

Under the influence of these orientations conventional economic theory has defined its subject-matter and the scope of its analysis in a rather narrow way and has convinced its practitioners that it is possible and useful to distinguish between 'economic' and 'non-economic' factors or aspects of social processes. Concrete economic systems or processes are thus believed to be adequately represented as isolated, self-contained and self-sustaining, closed mechanical processes with definable boundaries.

While it is true that individual economists who laid the foundation

1. JOSEPH A. SCHUMPETER, *History of Economic Analysis*, New York, Oxford University Press, 1955, p. 26/27.

2. The term 'neo-classical' is used here in a broad sense including standard micro- and macro-economics.

3. LIONEL ROBBINS, *The Nature and Significance of Economic Science*, London, Macmillan & Co., 1932, p. 16. WICKSTEED had pointed out that 'there is no occasion to define the economic motive, or the psychology of the economic man, for economics study a type of relation, not a type of motive and the psychological law that dominates economics dominates life'. Ph. WICKSTEED, 'The Scope and Method of Political Economy in the Light of the Marginal Theory of Value and Distribution', *Economic Journal*, Vol. 24 (1914), p. 10.

of neo-classical analysis have repeatedly and explicitely warned against any belief in the 'self-sufficiency' of neo-classical analysis particularly for the formulation of practical policies[4] the mainstream of neo-classicism has not heeded these warnings and has instead insisted on the autonomy and greater specialization of economic analysis if not its systematic isolation from other social sciences. A few illustrations may suffice to illustrate this point. SCHUMPETER denied the relevance of psychology for economic theorizing by stating, without qualifications and apparently with approval, that 'economists have never allowed their analysis to be influenced by psychologists of their time, but have always framed for themselves such assumptions about psychical processes as they have thought it desirable to make'[5]. DUESENBERY who rediscovered what he called the (Veblenian) demonstration effect defended the neglect of psychology 'as a deliberate attempt to sidestep the tasks of making psychological assumptions ... [which] has the advantage that it allows one to avoid getting out on a psychological limb which may collapse at any moment'[6]. Other neo-classical economists were even more explicit in rejecting attempts to relate economic analysis to other social disciplines. Thus, in opposing the trend toward interdisciplinary studies at American universities, G.J. STIGLER dissented by stating categorically that the royal road of efficiency in intellectual as in economic life is specialism – not interdisciplinary work[7].

These attitudes together with the orientations outlined above have tended to push conventional economic theory more and more into the direction of a formal, self-contained, closed mechanical analytical system and have prevented the assimilation of new perspectives and

4. Thus WICKSTEED stated explicitly 'that the economic machine is constructed and moved by individuals for individual ends, and that its social effect is incidental ...', 'that the market does not tell us in any fruitful sense what are the "national", "social" and "collective" wants' ..., that 'economic laws must not be sought and cannot be found on the properly economic field ...', that 'to recognize this will be to humanize economics ...', and 'that economics must be the handmaid of sociology', PHILIP H. WICKSTEED, *op. cit.*, pp. 11/12.

5. JOSEPH A. SCHUMPETER, *op. cit.*, p. 27.

6. J.S. DUESENBERY, *Income, Savings and the Theory of Consumers' Behavior*, Cambridge, Harvard University Press, 1949, p. 15.

7. G.J. STIGLER, 'Specialism: A Dissenting Opinion', *AAUP Bulletin 37 (Am. Ass. of University Professors)*, 1951/52, p. 651.

new paradigms developed by other disciplines. In fact, we seem to be witnessing to-day the extension of the neo-classical theoretical framework to such fields as the analysis of political behavior, public choice, and decision-making in general. While this development may be regarded by some as a move in the direction of interdisciplinarity it carries with it the dangers of a new kind of reductionism of social analysis to neo-classicism. It is not too late that social scientists and sociologists in particular take a critical position toward this kind of 'academic imperialism'[8].

II. INSTITUTIONAL ECONOMICS

Dissatisfaction with the 'mechanics of utility and self-interest'[9] and the narrow scope of conventional economics manifested itself very early; in fact, criticism has never ceased and is to-day stronger than ever. As always in times of economic and social crisis 'normal' economic theory is under attack and is criticized for its inability to provide an appropriate analytical framework for the diagnosis of the problems and the formulation of more adequate criteria, policies and remedies designed to cope with increasing internal and international disorganisation, environmental disruption, stagnation and inflation as well as unemployment, conflicts over terms of trade, *etc.*

The critique has always been directed against the scope and methodological preconceptions inherent in the equilibrium approach. This holds true for the historical school; it applies to MARX (with some qualifications) and to institutional economics the origins of which go back to the early critics of classical economics. What these critics have in common is the denial that economic processes (of production, distribution, and reproduction) can be adequately understood and analysed as closed, *i. e.* self-contained and self-sustaining systems isolated from a social and physical 'environment' of which the economic system is a part and from which it receives important inputs and with which it is related through manifold reciprocal inter-

8. BRIAN M. BARRY, *Sociologists, Economists and Democracy*, London, Collier Macmillan Ltd., 1970.

9. The words are those of W. STANLEY JEVONS, see his *Theory of Political Economy*, 2nd edition, London, Macmillan, 1879, p. 23.

dependencies. In other words, the critics have always considered the economy as an open system in continuous dynamic interaction with a more comprehensive social and political as well as physical system from which economic processes receive important organising (and disorganising) impulses and upon which they exert their own negative and positive influences. In addition to denying the self-contained and self-sustaining character of economic processes and by stressing the open character of economic systems the critics have challenged above all the belief in the mechanical and self-regulating character of economic processes. They have questioned the search for levels of partial and total equilibrium within an artificially closed system; they have refused to accept the view that economic analysis must confine itself to the study of a particular type or form of behavior; that the best method of studying complex phenomena is to separate the parts and study them one by one[10], and that specialism is the royal road to efficiency in social analysis. In short, the critics have always been more or less open to other social and natural sciences. This applies particularly to institutional economists.

In fact, institutional economics has always aimed at a coherent representation of economic processes within and as part of a complex social system and their interaction. Institutionalists have endeavored to make explicit the relationships and the reciprocal interaction of the parts with one another and with the 'whole'. Long before structuralism and functionalism appeared on the academic horizon institutionalists have placed this reciprocal interaction in the center of their theoretical investigations. Institutionalists have found it problematical and indeed unacceptable to draw classificatory distinctions between so-called economic and non-economic factors and between economic and social processes. In order to illustrate these important characteristics of institutional economics let me first contrast ROBBINS' definition of economics with GRUCHY's characterisation of institutional economics. According to GRUCHY economics is concerned with 'the study of the structure and functioning of the *evolving* field of human relations which is concerned with the provision of material goods and services for the satisfaction of human wants. [...] it is the study of the changing patterns of cultural rela-

10. VILFREDO PARETO, *Traité de Sociologie Générale*, Lausanne, Librairie Payot, 1917, p. 17.

tions which deals with the creation and disposal of scarce material goods and services by individuals and *groups* in the light of their private and *public* aims'[11]. Hence, whereas the neo-classical definition selects rational human conduct as a criterion GRUCHY makes it clear that economics is concerned with a much broader range of problems, namely the interdependencies of a great number of variables within a dynamic process of human and socio-cultural (interpersonal) relations resulting from changing modes of production, distribution and social reproduction. Not a particular *form* of behavior serves as the criterion of differentiation of economic analysis and determines its scope and approach but rather a particular set of interconnected dynamic problems which arise in the satisfaction of individual needs and public objectives.

In fact, the institutional approach focusses attention on the evolution of social systems and social processes. The analysis of the factors which provide the dynamic elements of these evolutionary processes has been in the center of institutional economics. Thus innovations, science and technologies as well as conflicts of interests, power and coercion in economic and social life have therefore always been included in their investigations. The central role of science, technology and innovations found an early expression in VEBLEN's *Theory of Business Enterprise* (1904). 'The material framework of modern civilization is the industrial system, and the directing force which animates this framework is business enterprise [...]. This modern economic organization of the "Capitalistic System" or "Modern Industrial System" so-called, its characteristic features, and at the same time, the forces by virtue of which it dominates modern culture, are the machine process and investment for a profit[12].' Innovation, technology and domination of economic processes by the machine process set the pace for the rest of the industrial system and distinguish the present situation from all previous forms of economic organizations and civilizations. The aim of institutional economics is 'a theory of business enterprise [...] sufficiently full to show in what manner business methods and business principles, in

11. A. G. GRUCHY, *Modern Economic Thought*, New York, Prentice Hall, 1947, pp. 550, 552 (emphasis added).

12. THORSTEIN VEBLEN, *The Theory of Business Enterprise*, New York, Charles Scribner's Sons, 1904, p. 1.

conjunction with the mechanical industry, influence the modern cultural situation'[13].

In addition, VEBLEN's theory of business enterprise laid the foundation for the analysis of economic instability and business fluctuations with their cumulative processes of investment based upon credit and the pervasive creation of debts, the generation of demand and employment and the inflation of all monetary values.

The preoccupation with the role of conflict, power and coercion is an intellectual heritage which, in America, antedates MARX and goes back to the Federalists and their European mentors prior to the American Revolution; early American institutionalists like VEBLEN and COMMONS have reformulated and integrated this heritage into their analysis of 'vested interests', absentee ownership, the economic role of the state, the legal foundations of capitalism, the importance of collective and political bargaining, public utility regulations and the analysis of collusion between financial, industrial and political power. In short, the problems raised by the industrial military complex and the 'power elite' have not been neglected in institutional economics.

In harmony with their early critique of the classical preconceptions and particularly the mechanics of self-interests developed by neo-classical utility, price and equilibrium theory, institutional economists have from the very beginning been sceptical of market prices in terms of which business enterprise tends to measure its performance and efficiency in utilizing scarce resources, *i.e.* of the criteria which price theory has accepted and legitimized, at least until quite recently, as criteria of optimal decision-making and as indicators of economic rationality in general. No wonder, therefore, that institutional economists were among the first who have called attention to and have analysed in considerable detail the social costs of production, long before the latter found a sudden and belated recognition in the current discussion of the increasing environmental and ecological disruption (including the exhaustion of non-renewable stock resources) with its serious threats to social reproduction and the quality of individual and social life. Unlike positive economics,

13. *Ibid.*, p.21. For an account of the emergence of innovations and new technologies, *cf.* VEBLEN's *Instinct of Workmanship and the State of The Industrial Arts*, New York 1914.

institutional economists have not hesitated to use the results of their inquiries as the basis of a critique of existing institutions and the *status quo*.

Equally significant have been the contributions of institutionalists to the analysis of underdevelopment (and development) and the persistence of increasing disparities not only between rich and poor countries but also within each of these two groups. MYRDAL's seminal studies of underdevelopment in South East Asia just as his earlier work on race problems in America are the outstanding examples of an institutional analysis which has overcome the conventional concentration on 'economic' variables such as savings and investment, employment, money, interest rates and GNP. MYRDAL and others have shown the true dimension and complexity of the persistent problems of poverty and underdevelopment and their relation to institutions, the soft state, the fundamental issue of the relationships between man and land including land-tenure relationships[14], the population-resources relationship, illiteracy, the low level and an appropriate content of education, poor health and nutrition, pre-scientific knowledge of techniques, traditional attitudes, value systems, class, caste and kinship systems, and, last but not least, the domination effect (PERROUX) and center-periphery problem (GALTUNG) with its dramatic effects on the terms of trade. All these problems neo-classical theory had pushed more or less aside; to-day (1976) they can no longer be ignored for the simple reason that the countries of the Third World have begun to insist upon a new world economic order. No analysis in purely economic terms which abstracts from these institutional factors is able to come to terms with the circular interdependencies between these factors and the cumulative causal interaction which delay and arrest the process of development.

The preoccupation with problems of the kind outlined above gives institutional economics its scope and shows why there have always existed points of contact with other social and natural sciences including sociology, social anthropology, political science and ecology.

Needless to add that sociologists, social anthropologists and political scientists have contributed in no small measure to our under-

14. ERICH JACOBY (with CHARLOTTE JACOBY), *Man and Land*, London, André Deutsch, 1971.

standing of such important elements of the development process as the analysis of caste, kinship and religion, factions and class conflict in traditional village life, attitudes and responses to innovation and modernization, economic motivation in traditional rural societies and socio-cultural evolution in general. However, in contrast to institutional economists these other social scientists have found it difficult, until quite recently, 'to think in terms of planning for national development. They are still laboring with finding out how people live and survive, and they are regularly, different from other economists, dealing with only segments of the national society and also mostly focussing their work on certain problems that have traditionally been at the center of their attention like *e.g.* caste in India. They have seldom attempted systematically to lay bare the circular causation between all conditions in a society they are studying[15].'

III. THE PRINCIPLE OF INTERLOCKING INTERDEPENDENCIES WITHIN A PROCESS OF CUMULATIVE CAUSATION AS A NEW THEORETICAL FRAMEWORK FOR THE SOLUTION OF CONCRETE PROBLEMS

With MYRDAL's formulation of the principle of circular causation we finally arrive at the core of institutional economics which sets it apart from earlier and contemporary non-institutionalist approaches and particularly from mechanistic equilibrium analysis. For, 'the principle of interlocking circular interdependencies within a process of cumulative causation'[16] is at the same time a new theoretical framework which rejects and replaces the traditional equilibrium framework and an analytical tool which permits the solution of concrete problems (*i.e.* of problematical, indeterminate situations) which have, so far, remained anomalies which could not be adequately accounted for in terms of the traditional 'disciplinary matrix'[17].

15. GUNNAR MYRDAL, *The Unity of the Social Sciences, Plenory Address to the Society of Applied Anthropology*, Amsterdam, March 21, 1975 (ms), p. 12.

16. GUNNAR MYRDAL, *Economic Theory and Underdeveloped Regions*, London, Gerald Duckworth & Co., 1957, p. 23.

17. I am using here THOMAS KUHN's *new* terminus instead of his earlier 'paradigm'. Following MARGARET MASTERMAN, KUHN now identifies the growth

The principle of interlocking circular interdependencies within a process of cumulative causation has a long history. It played an important role in MALTHUS' analysis of the growth and decline of populations. THÜNEN advanced an early version of it when he stated that the manual worker cannot rise into the class of enterpreneurs because he lacks the necessary schooling since his wages are low which, in turn, is due to the fact that the poor have higher reproduction rates and hence the supply of labor is almost always higher than the demand, and consequently wages tend towards the subsistence level[18]. MARX was the first to stress the fundamental reciprocal interaction between 'productive forces' and 'production relations' and the ideological superstructure. VEBLEN developed and used the principle of circular interdependencies of a number of factors within a process of cumulative causation in connection with his analysis of the function of the leisure class, the role of technology and credit particularly in connection with his explanation of the business cycle and the inflation of all monetary values; and so did KNUT WICKSEL, within a narrower market framework, in his account of the inflationary expansion of credit resulting from a deviation of the money (market) interest rate from the natural, real rate of interest[19].

However, it was left to MYRDAL to develop the principle of inter-

of knowledge with 'framework breaking' whereby the 'traditional' framework of analysis for problems solving (disciplinary matrix) is rejected *and* replaced by another set of ordered elements capable of 'solving' or accounting for what remained unexplained by the former: 'an artifact which transforms problems to puzzles and enables them to be solved even in the absence of an adequate body of theory'. THOMAS KUHN, Reflections on my Critics, in: IMRE LAKATOS and ALAN MUSGRAVE (Eds.), *Criticism and the Growth of Knowledge*, Cambridge, at the University Press, 1970, p. 273. *Cf.* also MARGARET MASTERMAN, *The Nature of a Paradigm, Ibid.*, pp. 59–90.

18. JOHANN H. VON THÜNEN, *Der Isolierte Staat* (1850), Jena, Gustav Fischer, 1910, pp. 440/441.

19. The neo-classical theoretical framework of general equilibrium or total interdependence of all prices in a market economy is of course also a case of mutual interlocking interdependencies. However, in contrast to VEBLEN and MYRDAL, the neo-classical framework postulates an isolated closed analytical model with self-equilibrating tendencies. Similarly the 'multiplier' or the 'accelerator' are cases of cumulative interdependencies even though the relationships referred to are conceived in a narrow mechanical and deterministic fashion.

locking interdependencies within a process of cumulative causation in a systematic way, and to have shown its significance and its implications as an alternative analytical framework for the entire field of social relations. He has done this in a continuous critical confrontation with the closed system of neo-classical equilibrium analysis, its hidden political or normative elements and in his life-long preoccupation with concrete and persistent problems such as race discrimination in America, international disparities, and the intractable problems of underdevelopment and poverty in Asia. In dealing with these problems MYRDAL has developed a new explanatory theoretical framework which consist of a matrix of ordered and specified elements of social conditions which, in their reciprocal interdependencies, can be shown to influence the evolution and transformation of social processes. As an exemplary illustration we choose the relationship between developed and underdeveloped countries and the interpretation of the process of development and underdevelopment. The problems to be accounted for are the empirically observed disparities and the persistence of development differentials between 'rich' and 'poor' countries or regions. Both rich and poor regions are characterized by a number of specific conditions which can be classified or categorized in different ways. MYRDAL considers the following conditions as relevant for the analysis and interpretation of the process of underdevelopment: *Productivity* (output/worker; income/population); *conditions of production* (techniques, scale, capital intensity, savings and investment, social overhead, labor utilization and employment); *levels of living* (nutrition, housing, hygiene, medical attention, education and training, literacy and income distribution); *attitudes* to production, work and living (discipline, punctuality, prejudice, apathy, world outlooks, religion, absence of birth control, *etc.*); *institutions* (man-land relations, tenure conditions, market structures, class, caste and kinship systems, structure of national and local government and administration, *etc.*) and *policies and legislation* (the 'soft state', lack of law enforcement, taxation, mobilization of actual and potential surplus). Needless to say, this does not represent a complete list of possible relevant factors and conditions; moreover, they may have to be classified in a different manner depending upon problems and regions to be investigated. However, the important point is that, among all the conditions, there

exists a causal relationship, and this relationship is to a large extent, but not always, of a circular character. In other words, the principle of circular interdependencies postulates a mutual responsiveness, *i.e.* a capacity of the different conditions to react upon changes of one or several elements. It is this circular and cumulative interaction which shapes the dynamics of the system which institutional analysis has to elucidate and to determine. In addition, it is essential to study the specific circular interrelations between the different factors and conditions before it will be possible to define objectives, to develop appropriate criteria of choice, and to make decisions with regard to long-run strategies as well as specific developmental policies. For, the formulation of such strategies and policies will require detailed, regional and local empirical studies designed to ascertain the concrete relationships between the different endogenous factors and conditions including their responsiveness to one another as well as the possible time lags and, in some cases, the lack of responsiveness of one or several of them to induced changes initiated by policy measures[20].

In other words, only by ascertaining the interaction and responsiveness of productivity and conditions of production to changes of the level of living, institutions and policy measures, is it possible to arrive at reasonable judgments as to the possible effects and outcomes of alternative policies, investments, and legislative action, as for instance agrarian reforms, new techniques, *etc.* In this sense, we believe that it is justified to regard the principle of interlocking circular interdependencies within a process of cumulative causation as the 'disciplinary matrix' which provides institutional economists with a new tool for the identification and ordering of the relevant elements in the study of socio-economic processes in their immensely diversified and changing complexity. More than this, the principle enables institutionalists (and other social scientists) to transform problematical situations and unsolved open problems (as for instance increasing disparities within and between 'rich' and 'poor' regions) into 'puzzles' which can be solved even when a complete theory and the precise knowledge as to the 'coefficients of interaction' are not (yet) available. As a matter of fact, this is precisely what the principle of

20. GUNNAR MYRDAL, *The Unity of the Social Sciences*, *op. cit.*, p. 6.

circular interdependencies has made possible not only with regard to the 'diagnostic' identification of relevant factors and conditions with regard to the problem of underdevelopment, but also with respect to the specification of possible measures and priorities required to deal with them.

One thing deserves special emphasis before turning to other matters. This is the question of the boundaries of the system and hence the question of the limits of the analysis. In other words, how far and how wide have we to extend the net of our investigations? A general but perhaps not entirely satisfactory answer is that all factors which can be shown to have a possible influence on the process or problem under investigation will have to be included regardless of whether or not this transcends the borderlines between traditional academic disciplines. In a more fundamental sense, the answer to the question as to the boundary of the system and hence to the factors to be included depends on the nature of the problem and the purpose of the investigation. Social Costs, environmental disruption, the increase of oil prices, and the emerging scarcities of non-renewable resources force economists to realize that economic processes depend upon a continuous exchange of energy and matter between the economy and nature and that available and accessible matter-energy is continuously and irreversibly transformed and partly dissipated into unavailable energy (increasing entropy). Therefore, an adequate and complete analytical description of economic processes cannot be obtained by the analysis of closed system (*e.g.* circulatory processes of production and consumption or systems of partial and total equilibrium, *etc.*) but calls for a representation of what the process needs in the form of input and what it does to man's environment by the emission of pollutants and the disposal of waste material. In other words, what is called for is a specification of the inputs required (and available), of the outputs including wastes disposed into the environment; the energy required (and available) for the transformation process as well as the resulting qualitative changes in time and space. I am listing these points not in order to suggest that institutional economics has already solved these problems but rather in order to call attention to the wide gap which exists between economic reality and economic models currently used for the theoretical representation

of economic processes. In short, the question of the boundary of the system raises much more fundamental problems than is usually believed; it includes the problem of the relevant time horizon or, more precisely, the question of the appropriate long-run time schedules of the inputs and outputs to be considered[21]. One thing, however, should be clear from the foregoing observations: the existing borderlines between traditional disciplines are to-day the most important obstacles to an adequate analytical treatment of economic and social processes. This is the essential point of MYRDAL's dictum: there are no economic (or, for that matter, sociological) problems; there are only problems and they are all complex. In fact, MYRDAL recently made the point that since research must be focussed on specific problems which are all composite and mixed, 'borderlines between our traditional disciplines should be transgressed systematically'[22].

The central significance of the principle of circular interdependencies and cumulative causation derives from the fact that it abandons and, in fact explicitely rejects the notion of stable equilibrium as a misleading and unwarranted analogy to mechanics. From the perspective of mechanics everything is treated as a pendular movement where changes produce their counterbalancing forces and where production merely becomes a process of transformation under the influence of a maximization rule[23]. 'Actually, the economic process is not an isolated, self-sustaining process. It cannot go on without a continuous exchange which alters the environment in a cumulative way and without being, in its turn, influenced by these alterations[24].'

In short, economic processes can be understood and must be represented for analytical purposes as radically open systems which

21. '[...] where we draw the abstract boundary, what duration we consider, and what qualitative spectrum we use for classifying the elements of the process depend on the particular purpose of the student, and by and large on the science in point'. NICHOLAS GEORGESCU-ROEGEN, 'Energy and Economic Myths', *Southern Economic Journal*, Vol. 41 (1975), 3, p. 350.

22. GUNNAR MYRDAL, *The Unity of the Social Sciences*, *op. cit.*, p. 15.

23. 'To equate the economic process with a mechanical analogue implies [...] the myth that the economic process is a circular merry-go-round which cannot possibly affect the environment of matter and energy in any way'. GEORGESCU-ROEGEN, *op. cit.*, p. 350.

24. *Ibid.*, p. 348.

exchange energy and matter with the environment in the course of which qualitative changes take place both with respect to the environment and the process itself. That is to say, socio-economic processes move in a definite direction and this direction needs to be ascertained[25].

However, even if we could get away from the fundamental fact of entropy the analogy to mechanics with the notion of stable equilibrium would still be problematical and usually misleading for the analysis of contemporary social conditions. For, these conditions are no longer, if they ever were, characterized by the interaction of a great number of more or less equal units in perfect competition none of which exert a dominating influence on the direction of the process and its outcome (*e.g.* prices, quantities produced and sold, inputs chosen, technologies adopted, and locations selected). Exchanges between dominating and dominated units, give rise to unequal exchanges and unequal terms of trade and to a choice of inputs, technologies and locations which are bound to result in self-reinforcing movements and an unequal distribution of income, growing disparities and polarization. In short, in the normal course of exchange relations between dominating and dominated units, between 'center' and 'periphery', between 'growth poles' and dependent economies there is no assurance that inequalities and domination will cease or 'backwash' effects will be compensated by expansionary 'spread' effects.

Under these circumstances, it becomes clear why the new theoretical framework of circular interdependence and cumulative causation is justified to reject the analogy to mechanics with its notion of stable equilibrium as a paradigm for problem solving in the social sciences. In fact, the new paradigm assumes that 'the system is by itself not moving towards any sort of balance between forces, but is constantly on the move away from such a situation. In the normal case a change does not call for countervailing changes but, instead, supporting changes, which move the system in the same direction as the first change but much further. Because of such circular cau-

25. 'Actual phenomena move in a definite direction and involve qualitative change. This is the lesson of thermodynamics [...] (*i.e.* the law of increasing entropy or the continuous dissipation of available energy into unavailable energy).' *Ibid.*, pp. 351/352.

sation a social process tends to become cumulative and often to gather speed at an accelerating rate'[26]. The principle does not prejudge the direction of the cumulative response nor the final outcome. In fact, it does *not* imply only 'vicious' circles. In other words, the response of the system to an endogenous or exogenous change such as deliberately planned exogenous impulses may either reinforce, retard or reverse the process; hence there is room for a variety of possibilities of interdependencies[27].

Moreover, the principle of cumulative causation and circular interdependencies offers a logical explanation why, under certain conditions, relatively 'small' changes are capable of bringing about comparatively 'big' effects or transformations in socio-economic as well as ecological processes. Once the conditions for cumulative processes (either upward or downward) exist in a particular system a relatively small additional impulse can act as an 'evocator' of substantial, non-linear and even 'jump-like' transformations particularly when certain limits or thresholds of tolerance are reached. Good examples for such disproportionalities between cause and effect can be found in the field of air and water pollution where critical limits of the carrying capacity of the environment may be reached or exceeded by small additional emissions of pollutants. Needless to add the principle of the disproportionality between cause and effect is not confined to environmental disruption. It applies also to socio-economic as well as to biological processes as it does to chemico-physical reactions.

Before concluding these considerations let me come back to the problem of the precision and completeness of our knowledge regarding cumulative causation and circular interdependencies of a great number of conditions. I have already referred to 'coefficients of interaction' of relevant variables, to possible time lags, and even to the total non-responsiveness of one or several of the relevant conditions to induced changes. Institutional economists are not opposed to precise and quantitative knowledge; on the contrary, they were among the first to call for and insist upon the quantification of

26. GUNNAR MYRDAL, *Economic Theory and Underdeveloped Regions*, *op. cit.*, p. 13.

27. GUNNAR MYRDAL, *Asian Drama*, Vol. III, New York, Pantheon Books, 1968, p. 1859.

relevant relationships between variables in scientific investigations[28]. They have insisted on precise concept formations as well as on detailed and disaggregated empirical and quantitative statistical studies of all important factors and their interaction irrespective of conventional borderlines between academic disciplines with a view to filling the gaps of our knowledge. But, unlike those who are interested in quantification and precision out of a 'quest for certainty' and a search for precise and purely formal solutions of frequently esoteric problems, institutionalists have remained aware of and have warned against the tendency 'to overlook the imperfection of our knowledge and to pretend to precise knowledge which does not stand scrutiny' and serve no rational purpose[29]. While the ideal scientific solution of a problem may be, as MYRDAL indicated, to formulate 'an interconnected set of quantitative equations, describing the movement – and the internal changes – of the system under the various influences which are at work'[30] such a quantitative formulation is to-day, as MYRDAL also pointed out, far beyond the horizon. Moreover, I doubt that we possess or will ever possess the data and the type of mathematics needed for the quantitative formulation of mutual circular interdependencies and thus for a precise expression of coefficients of interaction. In any event, it would be questionable if not illogical to require, or to make action dependent upon, a degree of quantitative precision of our knowledge which may be neither attainable nor necessary for the formulation of public policies.

IV. SOME PRACTICAL IMPLICATIONS OF THE PRINCIPLE OF CIRCULAR INTERDEPENDENCIES

In rejecting the mechanistic equilibrium approach as false and misleading and by stressing the importance of the principle of circular causation institutionalists do not argue that the situation is hopeless. While it is true that institutionalists regard circular causation, dis-

28. *Cf.* W. E. MITCHELL's work on business cycles and his programmatic article, 'Quantitative Analysis in Economic Analysis', *The American Economic Review*, Vol. 15 (1925), March. MYRDAL was one of the founder members of the Econometric Society.

29. GUNNAR MYRDAL, *The Unity of the Social Sciences*, *op. cit.*, p. 6.

30. GUNNAR MYRDAL, *Economic Theory and Underdeveloped Regions*, *op. cit.*, p. 19.

ruption, disparities and disequilibria as 'normal' tendencies they also regard these tendencies as the main determinants of the dynamics of the system, both evolutionary and cataclysmic[31]. At the same time, it is these dynamic tendencies towards disequilibrium which provide the main impulse for attempts at remedying, channelling and controlling social and economic processes by deliberate policy measures with a view to maintaining social reproduction.

What should be the specific policy objectives of such measures? How will they be determined? How can they be defined? Which criteria need to be used? These are some of the central questions with which institutionalists will have to concern themselves. They have only begun to deal with these problems and it would be too much to expect that a large measure of agreement has been reached, except at the most general level. MYRDAL, in his studies of underdevelopment, speaks of modernization ideals and economic integration as goals of policies designed to guide the process of development planning with a view to moving the entire social system 'upwards'[32].

Others have argued that balanced growth be considered as a

31. W. F. WERTHEIM, *Evolution and Revolution*, Harmondsworth, Penguin Books, 1974, p. 9.

32. MYRDAL's modernization ideals are the basic and explicit value premises underlying the development effort; they include social and economic equalization, greater rationality, improved levels of living, including nutrition, health and housing, rise of productivity, new institutions, attitudes and motivations including the liberation from all notions of fatalism and 'destiny', national consolidation, self-reliance. These ideals have been criticized as eurocentric and 'Western' in character (*cf.* CLIFFORD GEERTZ, MYRDAL's Mythology – 'Modernism and the Third World', *Encounter*, Vol. 33 (1969), 1, pp. 26–34.) While this may be so, it is at least worth noting that they represent positive values for influential groups in some of the underdeveloped countries and that they were even shared by a man like GANDHI: 'The young Indian must come round to a rational and objective view of material advancement. He must be able and willing to tear himself away from his family ties; flout customs and traditions; put economic welfare before cow worship; think in terms of farm and factory output rather than in terms of gold and silver ornaments; spend on tools and training rather than on temples and ceremonials; work with the low caste rather than starve with the high caste; think of the future rather than of the past; concentrate on material gains rather than dwell on kismet (destiny). These are extremely difficult changes to envisage in the Hindu social structure and ideas. But they seem unavoidable'. D. K. RANGNEKAR, *Poverty and Capital Development in India*, London, Oxford University Press, 1958, p. 81, quoted from MYRDAL, Asian Drama I, *op. cit.*, p. 62, fn.

general objective of policy measures particularly in developed countries. This advances us only in so far as it stresses the need to look for, and to develop appropriate criteria and definitions of states of dynamic equilibria which should be the basis for the formulation of the specific goals and objectives of all our strategies and policies in a world in which tendencies toward disequilibrium are typical and prevailing whereas conditions of equilibrium and balance are transitory and provisional. In this sense and in so far as unbalance and disequilibrium endanger social reproduction and hence human life and survival, the analysis of disequilibria and the search for dynamic states of balance as policy objectives may indeed be said to be complementary. The latter presupposes the former.

However, I would go one step further. The search for and hence the formulation of conditions of admittedly transitory balance and equilibrium will have to be guided not only by a critical and diagnostic identification of the full range of relevant variables, their circular interaction and their logical (probable) outcome but by fundamental and explicit value premises. For to avoid value judgments in the field of practical action in an effort of maintaining one's alleged objectivity is nothing but an evasion of the basic problems inherent in policy formulation. In order to contribute to the latter social inquiry must go beyond a 'positive' analysis of the interaction of relevant variables; it will have to assess critically the outcome of social processes *in the absence* of deliberate social action and, in the light of such a critical evaluation of reality, contribute to what may be called the formulation of possible and desirable states of dynamic balances or processes as goals of social policies and social development. The creative formulation of possible and 'desirable Futures' (OZBEKHAN) goes far beyond anything that has thus far been undertaken by social analysis. Institutionalists are certainly not the only ones who have something to contribute to these new tasks. They bring to it perhaps a more thorough understanding than other social scientists, of the relevant circular interdependencies which determine the outcome of action or inaction. My own view is that possible and desirable Futures need to be defined with reference not only to general objectives of modernization, but with respect to more specific requirements defined in terms of essential or basic human and collective needs and the minimization of human suffering.

In fact, what is essential, perhaps more than anything else, are new fundamental principles for the determination of social goals and for the formulation of our public policies. Such basic principles must be 'operational', *i.e.* they must not remain vague and ambiguous like the utilitarian principle of maximizing happiness but must be capable of being translated into criteria of action and into quantifiable indicators of performance. Not maximization of pleasure, but the satisfaction of basic human needs or the minimization of human suffering seems to me to constitute such a first principle which could guide practical policies and serve as a yardstick of social efficiency. For, unlike happiness and welfare 'human suffering is utterly concrete [...]. To wipe out hunger and sickness, unemployment and poverty, illiteracy and ignorance can give rise to practical political action'[33] on a national and international scale. It is this 'inverted utilitarianism' which has been suggested as the first principle which must be our value premise to-day and in the future if we want to come to terms with the problems of social and ecological disruption as well as growing national and international disparities, inflation, unemployment, poverty, and last but not least with the threat to world peace.

In this context, I do not consider it as my task to outline the full implications of such a new normative approach to social analysis and social action. Suffice it to say, however, that what would be involved is a basic re-orientation of social analysis which ultimately will have to find expression in a reversal of our previous epistemological attitudes and thought processes: Many of the factors which we have so far accepted as given (even if only as parameters) as for example individual preferences, the state of technology, the principle of 'investment for profit' (as VEBLEN used to say) will have to be considered as dependent variables which need to be adapted and modified in accordance with the new value premises of minimizing suffering and providing the means for the gratification of basic human needs and the maintenance of essential economic, social and ecological balance[34].

33. GUNNAR ADLER-KARLSSON, 'Inverted Utilitarianism or a New Way of Life in Developed Countries', *Symposium on a New International Economic Order*, The Hague, May 23–24, 1975, p. 68.

34. For evidence that the practical and political implications of such a re-

V. CONCLUSIONS

I hope to have demonstrated that institutional economists have provided more than a rational critique of the scope and method of traditional economics. They have shown the trans-disciplinary character of our problems, and they have considerably broadened the scope of socio-economic analysis. Above all, they have provided an alternative analytical framework for the explication of the circular interdependencies within a process of cumulative causation which provides economists and other social scientists with a tool for the solution of theoretical and practical problems.

The principle of cumulative causation does not reflect a static view of interdependencies giving rise to a stabilization of the *status quo* within a given form of social organization. The principle does not rule out conflict, tension, contradiction, change, and transformation; on the contrary. Furthermore, the active factors in circular interdependence include both subjective and objective elements: common ideas, valuations, ideologies and institutions as well as techniques, and 'production relations'. While the principle refuses to attribute exclusive or primary importance to one or the other set of factors in circular interaction, it does not rule out the possibility that either one or the other set of factors may exert a predominant or decisive influence with either positive or negative effects. What the principle rejects as futile is any search for a primary cause.

In this as in other respects, institutionalists have indeed followed the lead of the problems with which they are concerned. This does not preclude specialization nor does it call for expert familiarity of

orientation are being investigated, *cf.* in addition to MYRDAL's writings, IGNACY SACHS, 'La crise dans les stratégies de développement: Vers l'identification de nouveaux objectifs', OECD, Séminaire: Sciences, Technologie et Développement dans un Monde en Mutation, Paris 1975. UNEP, The Cocoyac-Declaration, Development Dialogue, 1974, No. 2, pp. 88–96. 'What Now – Another Development', *The 1975 Dag Hammarskjöld Report*, prepared on the occasion of the 7th Special Session of the United Nations General Assembly. HASAN OZBEKHAN, *Technology and Man's Future* (ms), Santa Barbara 1965. K. WILLIAM KAPP, 'Umweltkrise und Nationalökonomie', *Schweizerische Zeitschrift für Volkswirtschaft und Statistik*, Vol. 108 (1972), 3, pp. 231–249.

the results of all disciplines. It means, however, as C. WRIGHT MILLS put it in another context, that a social scientist will have to be 'familiar enough with the materials and perspectives of other disciplines to use them in clarifying the problems that concern him'[35]. It does not mean that a social scientist needs to master everything and all fields.

The relevant boundaries of the limits of social inquiry differ depending upon the problems under discussion. In any event, in view of the cumulative circular interdependencies which link the economy to the environment and the resource base and hence to the interests of future generations economic processes cannot be adequately described without reference to a time horizon: that is to say, without reference to the time schedule of inputs in relation to scarce available resources, and the direction of the qualitative changes which the use of energy and matter as well as the disposal of waste have upon the environment and hence on economic processes and the well-being of future generations. It is this concern for a longer time horizon and for the complex interdependencies of actual social phenomena and processes moving in a definite direction with possibly irreversible qualitative changes and, last but not least, the rejection and the replacement of the mechanical analogy by the principle of circular causation which gives modern institutionalism, what I venture to call its modern character and its transdisciplinary scope.

35. C. WRIGHT MILLS, *Sociological Imagination*, New York, 1959, p. 142.

CHAPTER VII

THE OPEN SYSTEM CHARACTER OF THE ECONOMY AND ITS IMPLICATIONS*

[In his introduction to the volume from which this chapter is reprinted, Kurt Dopfer puts forth as propositions four requirements of a future structuring of economics: It would have to take a holistic approach and a long-run view and it would have to view itself as an empirical science (i.e. one in which a theory has to be tested against empirical fact so that it can be verified, or rejected as false) and, essentially, as political economy. The latter means that economics cannot take refuge in a politically value-neutral stance which only leads to a neglect of crucial factors, especially in the prescriptive parts of its work. The contributors to the book, Jan Tinbergen, Harvey Leibenstein, Sir Roy Harrod, Gunnar Myrdal, K. William Kapp and Shigeto Tsuru, elaborate on these themes.

In his chapter, Kapp stresses the fact that economic systems are continuously affected by non-economic factors and that these establish its "open" character. Indeed, they may determine the objective function in whatever optimization or other policy formation is the purpose of the analysis. For instance, he notes that the treatment of an agricultural system as a merely economic one, albeit subject to biological "restrictions," yields a result biased towards the maximization of whatever outputs can be measured in economic terms, as against the realization of ecological or biological objectives which do not figure in this kind of calculus. The defect goes back to the times when water, clean air and other such natural resources were explicitly considered free goods. A system-wide approach, as he calls it, is indicated instead. Similar conditions hold true for the industrial sector, of course. Economics cannot attain any meaningful normative purpose in the absence of such an expansion of its viewpoint and areas of concern. - J.E.U.]

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I Introduction

The mainstream of economic theory did not foresee the global environmental crisis just as it did not, in the course of its history, anticipate other important problems which proved to be of major significance. The long-standing neglect of social costs is not the first, and the current food and energy scarcity will not be the last demonstration of the fact that economic theory and practice tend to take account of important problems only under the pressure of public opinion and the urgent necessity of coming to terms with far-reaching negative effects caused by specific emergencies.

Environmental disruption and the growing scarcity of resources have finally made us aware of the fact that production, allocation and the choice of inputs and location are taking place not in closed or semi-closed systems which economic science has traditionally used as theoretical models for the explication of economic processes but in basically open systems. Increasing awareness of the open-system character of production and consumption is, of course, no guarantee that its full methodological and practical consequences are fully comprehended. Have we really understood the full implications of the fact that serious incompatibilities may develop between economic and ecological

(as well as social) systems, which threaten the economic process, its social reproduction, and hence the continued guarantee of human well-being and survival?

II Economic Systems as Open Systems

The Physiocrats were the first to perceive the economy as a closed system of interdependent variables. They were led to this realisation partly by the prevailing notions of natural order, the moral philosophy of utilitarianism and the transfer of the equilibrium concept from mechanics to political and economic analysis and partly by their anti-mercantilist policy suggestions which they advanced as practical remedies to cope with the threatening economic and political crisis prior to the French and American Revolutions. The perception of production and reproduction as processes occurring in essentially closed and more or less self-regulatory systems served their pre-analytical notions and supported their normative policy judgements.

Hence the development of closed or semi-closed theoretical models which have survived in the predominant schools of economics both in its neoclassical and its Keynesian versions and have continued to shape the scope of conventional analysis, the formulation of basic concepts and, last but not least, the delimitation of the scope of its subject-matter. Institutional and, to a lesser extent, Marxist economists have always criticised this narrow scope of conventional economic theory and have insisted that economic systems are parts of a much broader political and institutional system from which they receive important impulses and which they, in turn, are capable of influencing and even changing in a variety of ways.

The degradation of the physical and social environment and the exhaustion of important non-renewable (capital) resources have merely added a new and decisive illustration of the fact that economic systems are intimately and reciprocally related to other systems and are in this sense fundamentally open systems. To view the economy as a closed system may be methodologically convenient and enable economic theory to formulate its concepts and theories in accordance with the canons of formal mathematical logic, but this tends to perpetuate a wrong perception of reality which narrows our theoretical horizon. In fact, the resulting perspective and the criteria of evaluation are those in terms of which the system of business enterprise tends to evaluate its

performance. While this may be an explanation it is no justification for the continued adherence to the traditional closed-system approach of economic science which, as an empirical system of knowledge, must follow the lead of its subject-matter if its conclusions are not to become misleading and irrelevant.

The current discussion of environmental disruption has used air and water pollution caused by the emission of waste residuals by producers and consumers as typical illustrations of the impact of production and consumption on the environment. We are far from denying the importance and the typical character of the social costs represented by air and water pollution. In fact, they are the classical cases which have led to the growing awareness of the interdependence of economic and ecological systems. However, we have chosen modern agriculture in order to illustrate the essentially global and open-system character of economic processes and to show the full range of global consequences which production and specific techniques, that is economic choices guided by market costs and returns, may have upon ecological balance, society and social reproduction.

III Modern Agriculture as an Illustration of the Global and Open-System Character of the Economy

Agriculture, both in developed and less-developed countries, employs new techniques and new capital inputs with far-reaching ecological and socio-economic consequences. In fact, modern farming has become a highly capital-intensive mechanised industrial activity. High-yielding varieties have changed the character of agricultural production. The increased yields of these new varieties are due to their specific effective and 'aggressive' feeding characteristics which speed up the depletion of the soil. This, in turn, requires the application of considerable amounts of chemical fertilisers in addition to other complementary inputs as, for instance, water and pesticides as well as additional capital inputs such as farm machinery, tractors, harvesters, spraying equipment, aeroplanes, and so forth. It is these inputs that account for the higher yield per acre or per farm worker. As a result of these technological changes fields have become larger and the average size of farm has increased; plowing, sowing, the application of fertilisers, spraying of insecticides, harvesting, poultry raising, cattle breeding, feeding, milking, and so on – all have become

mechanised operations resembling the assembly line in other industries. Millions of farms have disappeared; the rural population has declined and moved to cities thus adding to urban congestion and overcrowding.

The ecological consequences of these technical and structural changes may be summarised briefly and succinctly. Technology and mechanisation have taken command by imposing their imperatives upon farming as an industry. What used to be a highly diversified (biological) system of growing food and primary materials has been transformed into large-scale and highly specialised monocultures. Moreover, modern farming has become a major user of capital goods produced by farm-supporting industries employing an increasing number of industrial labourers and making heavy and increasing demands on scarce resources, particularly electricity and petroleum. Thus agriculture is now a major consumer of scarce energy and, viewed as a whole, uses perhaps more petroleum than any other single industry. In fact, farming has become a way of turning petroleum into food. Our harvests of food and primary materials may indeed be said to be 'harvests of oil'.[1] Despite the fact that farming could be a net energy-producing sector of the economy – by capturing the energy of the sun – and despite the growing energy crisis, we continue to measure efficiency in farming in terms of output per hour of labour or per acre instead of measuring it, for example, in terms of output per unit of energy.[2] This dependence of modern agriculture on petroleum is particularly dangerous for those countries which, like India, have opted for a 'Green Revolution' and the use of high-yielding varieties, and are now experiencing the first signs of a stagnation of their output.[3]

Nor is this all; the application of chemical fertilisers and the utilisation of pesticides (insecticides, herbicides, fungicides) are subject to diminishing returns. Hence, increasing doses of chemicals need to be applied to secure additional returns per unit of input. Not all of these chemicals can be assimilated by plants; they find their way into rivers and lakes. Growing specialisation with its emphasis on monocultures has made crops more susceptible to sudden massive losses due to pest invasions. The new varieties are themselves less resistant than non-hybrid varieties. Moreover, pesticides may kill not only the pests but their enemies as well; in addition, the resistance and immunity of certain pests are known to increase by natural selection. Hence increasing doses of pesticides are necessary in order to compensate for the

loss of their effectiveness. Furthermore, modern farming tends to use pesticides quite mechanically according to generalised spraying time schedules provided by the manufacturers. This has led to indiscriminate operations of 'over-kill' which continue as long as additional applications of pesticides are, or are believed to be, profitable; in other words, returns are calculated without considering the system-wide social losses or the inflated price rises and other 'imperfections' of the market for farm products. It is true, costs may also be inflated due to 'administered' and inflated oligopolistic prices of farm inputs but the fact remains that the guiding commercial cost–benefit calculations according to which pesticides (and fertilisers) are being applied, do not take into account their ecologically negative consequences.[4] The neglect of the social costs resulting from ecological hazards to flora, fauna and human beings, as well as the substantial energy requirements for the production of chemical inputs, is only one aspect of the situation; the other is the failure to take account of potential benefits of alternative techniques of production.

Finally, the new crops seem to be characterised by relatively low protein contents, that is a lower capacity (for example of hybrid corn) to feed and raise animals. This, in turn, has called for more imports of fish protein in the form of fish meal to supplement animal diets. As a result of these undoubtedly profitable imports – profitable both for the Peruvian fishing and export industries and the U.S. and European importers of protein-rich fish meal – we are confronted with the ecologically and, if properly calculated, also economically absurd situation that a continent with protein-poor diets (South America) supports today the relatively protein-rich diets of highly developed countries.[5] Monetary or market criteria of efficiency and of economic rationality and the resulting export–import pattern tend to give rise to a global allocation of inputs and a distribution of outputs which may be far from desirable either ecologically or in the light of a concept of substantive rationality which would take account of actual human requirements in different parts of the world. (We are not suggesting that Peru should stop all exports of fish protein to countries with protein-rich diets and should instead cover the protein deficiencies of South America. Export of fish meal will have to remain an important source of foreign exchange to pay for Peru's imports of capital goods. However, the existence of this protein-rich supply of fish and the widespread deficiency of the diet of Peru's poor population, as indeed of the population of

the rest of South America, provides at least a basis for a realistic search for alternative solutions and new patterns of foreign trade. The problem under discussion is the neglect of basic nutritional needs in the process of planning and development.)

As a preliminary conclusion we may say that the organising principles of economic systems guided by exchange values are incompatible with the requirements of ecological systems and the satisfaction of basic human needs. Our traditional criteria of technical efficiency, of cost–benefit calculations and of economic rationality are the crucial points under discussion. Their limitations become manifest as soon as we view the dynamic interaction of open social and economic systems with specific ecological systems.

It is hardly necessary to add that, if we accept this point of view, as we believe we must, new criteria of rational action and planning are called for. Above all, alternative solutions different from those which we have pursued in the light of the narrow economic calculus in terms of market criteria impose themselves. In the concrete case of modern agriculture it may perhaps be useful to be more explicit in order to counteract any possible misinterpretation of our position. We are not suggesting a return to traditional agriculture or a ban on fertilisers, pesticides and modern technology; rather, the practical and theoretical implications of our position are to abandon our traditional notions of efficiency and rationality and to redefine them in the light of the 'new' realities of the interdependency of systems. In view of the system-wide repercussions of agricultural production, and indeed of production in general, it must be clear that neither technical feasibility nor technological imperatives nor micro-economic rationality, in terms of net private returns and entrepreneurial costs can provide adequate answers to the question of what are desirable aims and policies. Criteria of economic performance can neither be derived from technical feasibility nor from economic efficiency in the narrow sense, but must be formulated in the light of a system-wide appraisal of ecological, social and economic advantages and disadvantages. As far as modern agriculture and the need for high levels of output and productivity are concerned, it will be necessary to envisage and appraise a whole bundle of complementary aims and alternative strategies, such as a greater diversification of crops, the planting of specific crops in geographic regions less affected by pests, a return to appropriate crop rotation, the development of pest resistant varieties which have

the desirable yield and quality characteristics, the systematic implementation of bio-environmental controls,[6] and greater reliance on monitoring pest populations with a shift from methods of 'over-kill' or even '100 per cent pest elimination' to 'treatment when necessary' and the application of pesticides as stop-gap emergency measures. In countries like the United States, the return to cultivation of some of the nearly 60 million acres taken out of production at a cost of three to four billion dollars annually could compensate for the possible increase of crop losses due to a reduction of the present over-intensive application of pesticides with its disruptive effects on the environment.[7]

IV The Open-System Approach

Of course, it is insufficient to say that the use of destructive technologies and techniques applied in accordance with the principle of maximising net returns has 'external' effects on regional, national and international scales. Nor will it be sufficient to call for more information and more interdisciplinary research. All this is true enough. As our discussion of modern agriculture has shown, the appropriate unit of analysis is neither the individual farm, nor the national farm economy, nor a particular ecological system. The relevant unit of analysis is much larger and the time span that counts is much longer than those in terms of which business enterprise and economic science have traditionally perceived and defined the notions of efficiency, rationality and optimality.

Thus the environmental crisis forces economists to acknowledge the limitations of their methodological and cognitive approaches and to reconsider the scope of their science. The classical economists – Adam Smith and his successors – could still claim with some justification that economic systems could be understood as semi-closed systems because, in their time, air, water, and so forth were, in a sense, 'free' goods and because they were convinced – wrongly – that rational action – under competitive conditions – had only positive social effects. This belief has turned out to be an illusion. To hold on to it in the face of the environmental crisis can only be regarded as a self-deception and a deception to others. Contemporary economists who continue to discuss economic and environmental problems in closed systems have much less of an excuse for this practice than the classical economists. Human action and economic decisions relating to production are not taking place in closed or even semi-closed

systems but within a network of relationships and dynamic structures in continuous open interaction with one another. In short, we need a new approach which makes it possible to deal with the dynamic interrelations between economic systems and the whole network of physical and social systems and, indeed, the entire composite system of structural relationships. It would be an illusion to believe that such a system view of the economy can or will emerge from the traditional modes of analytical thinking; nor would it be realistic to expect systems thinking 'to spring into existence in a mature state...it must evolve out of proposals, discussions, reformulations and experience'.[8] Systems thinking is inevitably complex inasmuch as it is concerned with discontinuous non-linear 'feedback' effects which characterise the dynamic interdependencies between the different systems as well as of each subsystem with the composite whole. In this sense, it is indeed a 'step away from traditional science'.[9] It is, by its very nature, multi-dimensional, multi-disciplinary and integrative. Thinking in terms of interdependent systems is an innovation and presupposes a new outlook which calls for an abandonment of old knowledge 'before the new can be created'.[10] Such innovation is, as a rule, experienced as a source of annoyance, a destroyer of routine, an underminer of complacency.[11] Innovations of this kind can hardly be expected to come from scholars with a conventional outlook but call for a wider range of reference than the representatives of 'normal' science bring to bear upon their subject-matter.[12]

While ecologists and natural scientists, as a rule, have a better understanding of complex interdependencies they too will have to widen their perspective in dealing with environmental and other global problems. Few ecologists seem to have dealt with the impact of economic decision-making and technological factors upon ecological systems; nor have they sufficiently come to terms with human values and problems of costs. 'Ecology works very well for families of plants and groups of animals, but up to now there does not exist an individual human ecology.'[13] We are only at the beginning of thinking in terms of interdependent systems and considerable research will be required to close the gaps in our knowledge as to the structure and interaction of a multitude of systems and their 'performance'. Nevertheless, it would be a mistake to believe that we have to start from zero. Systems analysis has a long history in other disciplines such as biology, particularly micro-biology, genetics, chemistry, nuclear physics and, last but not least, cultural anthropology.[14]

Of course, it will not suffice to aim at a merely formal representation of the open-system character of the economy in its interaction with something called environment. What is required is to overcome the essentially dualistic conceptualisation of economy and environment in order to give our analysis the necessary empirical content. Determination of basic needs and requirements of health and survival, of environmental norms and maximum tolerable levels of contamination; environmental-impact studies of alternative technologies in specific localities rather than linear physical flow models are some of the empirical and quantitative problems that call for exploration and analysis; social science will have to come to terms with the key problem of the open-system character of the economy – the fact, namely, that production derives material inputs from the physical and decisive impulses from the social system which, in turn, may be disrupted and disorganised by the emission of residual wastes up to a point where social reproduction itself may be threatened.

Systems thinking will have to avoid a number of pitfalls, some of which may be listed briefly within the context of the present discussion: the tendency of concentrating attention on aggregates and their historical correlation without a causal analysis of the effects of specific technologies, production, consumption and income patterns; the use of constant coefficients of correlation and the neglect of circular cumulative interdependencies; the failure to consider the influence of institutional factors including the role of vested and conflicting interest groups; the insistence upon determinate and precise solutions of formal problems instead of a search for practical and useful answers to urgent practical problems; and the neglect of a careful appraisal of alternative goals and technologies as well as of their opportunity costs and potential social impacts.

V Economics as a Normative Science

The methodological and cognitive implications of the fact that economic systems are not closed but are fundamentally open systems would be far-reaching. Above all, it would be necessary to take account of the complex interaction and circular interdependencies between different systems. Production and consumption put in motion complex processes which have serious and determinable negative consequences on the physical and social environment with an inevitable impact on distribution;

these interdependencies imply a forced transfer of 'unpaid' social costs, which constitute a secondary redistribution of real income primarily (but not exclusively) to economically weaker members of society as well as to future generations. Moreover, individuals and groups whose income and health are adversely affected by destructive technologies under specific institutional arrangements are victims of a process of production over which they have no control, and against which they have no adequate legal redress. These inter-system relations with redistributive effects are not exchange or market relations. They represent extra-market physical flows from corporate production units and individual households to the environment and back from the latter to the former. The character of these flows needs to be understood and subjected to empirical and theoretical analysis and appraisal.[15] These non-market physical flows raise important problems of circular cumulative causation which must be recognised as typical characteristics of economic processes.[16] They have a direct bearing on actual costs and benefits; they are neither 'external' nor are they voluntary or contractual. In short, they are extra-market phenomena and market prices do not provide adequate (if indeed any) criteria for their evaluation.

The actual costs may be regional or system-wide in character because pollution affects not only single individuals in specific localities but entire groups of people and regions, extending frequently beyond national boundaries. Its effects, moreover, will be unequally distributed. The same applies to practically all other negative effects of environmental degradation. Noise, urban and traffic congestion, industrial accidents, occupational and civilisational diseases, fatigue, frustration – are only some of the symptoms of serious social dislocation experienced by individuals but system-wide in their repercussions and significance. Their impact will be felt in the form of a deterioration and dehumanisation of the quality of the living and working conditions of millions of people both today and in the future. These phenomena raise complex problems of measuring and evaluating environmental costs (and benefits) which are not solved by such conceptual tools as revealed preferences, willingness to pay or to compensate, Pareto optimality and so on, for these concepts are derived from our traditional approach based upon a 'methodological subjectivism'. The validity of this has never been generally accepted even in those fields of analysis for which they were originally developed. Instead of attempting to calculate benefit and cost in terms of subjective preferences and exchange values it would be

necessary to assess the environmental and social impact of these physical flows socially and hence politically and to translate 'physical and social impacts into politically understandable and relevant trade-offs'.[17] Only in this way can we hope to arrive at reasoned choices between conflicting interests and objectives in the light of explicit political and, hence, moral judgements rather than in terms of calculated 'shadow' prices and costs derived from market values, which, upon closer analysis, can be shown to reflect either the subjective preferences and valuations of the experts and/or of powerful vested interests.[18]

The degradation of the physical and social environment and the recognition of economic systems as open systems would make it necessary to define socially desirable macroeconomic goals (or norms) of the economy. These social goals include a number of conflicting general objectives such as greater equality or justice in distribution, economic stability, full employment, efficiency in the utilisation of scarce resources, participation in decision-making, and so forth. At the same time, they will have to include the maintenance of dynamic states of ecological and economic balance as one of the fundamental prerequisites of socio-economic reproduction and growth. The definition and concrete determination of such macroeconomic goals is not an easy matter partly because they require a considerable amount of knowledge regarding the effects of alternative levels of output on the environment; of the consequences of alternative inputs, technologies and locations which, in the light of the carrying capacity of the environment, can be tolerated.

The determination of such macroeconomic goals requires an interdisciplinary-research effort which exceeds the competence of economists but which cannot be conducted without them. However, we do not believe that the price mechanism and the monetary calculus can be relied upon for the evaluation and determination of the relative importance of different goods and services including the choice of inputs, techniques and location, and this for several reasons. In the first place, the price mechanism and an evaluation in monetary terms reflect the willingness to pay of individuals and groups and hence also the inequality in the distribution of income and market power. The supply and demand mechanism is, in this sense, essentially a non-egalitarian and elitist mechanism of evaluating goods, services and environmental damages. Furthermore, the market and monetary calculus is not adapted to the social evaluation either of environmental damages or the type of public goods and services required for the

maintenance of dynamic states of ecological and economic balance. We are not arguing that it is impossible to place a monetary value upon environmental damages or for that matter on the public goods and services. After all it is always possible to evaluate them at their monetary costs. However, it can be shown that monetary evaluation, in this sense, fails to ascertain and express their relative social importance in the sense of value to society (and individuals) both in the short and in the long run. Human life and human health may be evaluated in monetary terms (for example in terms of the accumulated income earned or lost over time at compound interest), but is such a procedure cognitively warranted? For several reasons we hold that such a procedure is not justifiable because monetary values are not an adequate criteria in terms of which the qualities under consideration can be expressed and measured.[19]

The fact that we deal with collective (public) goods and services and with dynamic states of balance including the use and exhaustion of non-renewable (capital) resources which will have negative effects on future generations complicates matters and make all monetary evaluations problematical if not indeed unacceptable and cognitively irrelevant. In short, as soon as the open character of economic systems is fully realised the formulation of social goals and objectives and the problem of collective choices can no longer be avoided. Such objectives and choices with respect to the maintenance of dynamic states of ecological and economic balance essential for the maintenance and improvement of the conditions of social and individual existence (quality of life) must become the point of departure for a normative science of economics. The elaboration of a quantitative framework for these social objectives is currently under way in the form of the development of work on social and environmental indicators. Such indicators provide at least the first step and the basis upon which social and environmental normative judgements and collective (political) decisions and priorities could be formulated. Here is the open frontier and the unexplored territory for normative economics.[20]

The next step would be the elaboration of the necessary strategies or alternative courses of action designed to guarantee the attainment of social goals decided upon. This is essentially a task of choosing alternative instruments of control (and economic policies) with a view to assuring that the desired social goals are indeed reached. These measures of control will have to go beyond the scope of traditional economic policies, for they will be

concerned with the assessment and choice of technologies, of the quality and quantity of specific inputs and location, and with the change of behavioural and motivational patterns of producers and consumers. An equally if not more important task would be the systematic search for new inputs, alternative technologies, new patterns of location as well as new patterns of consumption or styles of life. In other words, the fact that economic systems are not closed but open systems which depend for their reproduction upon inputs drawn from the physical environment into which they emit pollutants and destructive residuals makes it necessary to consider most of the factors which economic theory has so far regarded as constant or given data as the very problem which needs to be solved or, methodologically speaking, as dependent variables. They are neither constant nor given. The socially warranted technologies, the required inputs (including the location of production) are not known beforehand; on the contrary, they need to be explored and determined. Which technologies, which input pattern, which locations are to be chosen and, ultimately, which output and which institutional behaviour patterns are required and socially warranted are in fact the very problems which call for a solution and which a normative science of economics would have to elucidate and help to explore in the light of the desirable social goals and objectives and the system-wide consequences and actual costs of alternative courses of action. In short, a normative science of economics taking account of the open-system character of the economy would imply a complete reversal of the analytical procedures of the discipline as hitherto practised and applied. Instead of postulating a given state of technology, given behaviour patterns and given individual preferences and aiming at the explication of the allocation mechanism of a hypothetically closed system under autonomous and self-regulating market forces and on the assumption of rational optimising action of individual producers and consumers, the new task of economics would be to elucidate the manner in which collectively determined social goals and objectives could be attained in the most effective and socially least-costly manner.[21]

Two final observations may be useful with respect to both the concept of economic efficiency and also the educational requirements which the open system and normative approach to economics calls for. If economic systems are fundamentally open systems, and if, as we have implied throughout our discussion, uncontrolled economic decisions based upon the calculation of entrepreneurial costs and returns are basically incompatible with

the maintenance of dynamic states of ecological and economic balance,[22] not only the concepts of costs and returns but, above all, those of economic efficiency and optimality need to be redefined and reformulated. They have to be broadened to take account of the fact that what may be efficient and optimal in a closed system of production and distribution may be inefficient and anything but optimal in the long run and may be destructive from a social and global viewpoint due to the neglected cumulative effect of the inter-system interactions between open systems.

The educational implications of the open-system character of the economy are equally far-reaching. Instead of introducing students in economics, especially freshmen, to the highly esoteric formal apparatus which fills the conventional textbooks it seems to me indispensible that they must first be introduced to the open character of economic systems. Systems thinking while undoubtedly complex offers no unsurmountable difficulties for the beginner. Problems of entropy (that is the tendency of increasing disorganisation), of feedback effects (that is the fact that part of the output is fed back and affects succeeding inputs and outputs), material balances, maximum limits of contamination, cumulative causation, need to become part of the teaching of economics in order to prepare economists of the future for the tasks with which they will be increasingly concerned.

VI 'Conceptual Freeze' or Intellectual Reconstruction

It was not our purpose to predict the future of economics but to show a possible and, in our estimation, necessary direction of its change and reconstruction. Of course, having come this far we face the question as to whether the notion of a normative science of economics is not a vision of an alternative which has no possibility of being realised in the calculable future. Is it not more likely that economists will continue to view economic systems as essentially closed systems and to hold on to the established procedures and methods? There is indeed considerable evidence for an affirmative answer to this question. Neoclassical economic theory, just as the market economy, have shown a remarkable capacity to assimilate new problems and new developments. In this context we are thinking, for example, of such proposals as the establishment of private or public property rights with respect to rivers and lakes or the suggestion that rights to pollute (pollution permits) be sold and bought at auctions and/or be

made the subject of bilateral negotiations between polluters and those who are damaged by pollution. What these proposals amount to is, in fact, a return to the conventional wisdom of relying on property rights and market costs and returns instead of preserving the principle of maintaining communal rights to nature and treating them as social use-values serving fundamental human requirements. We are also thinking of the current tendency of assimilating social costs into conventional economics by means of the empty-box concept of 'externalities' or of proposals for the 'internalisation' of social costs through fiscal policies, subsidies, and so on. I feel that neither the concept of externalities nor the introduction of social-cost curves into formal theory nor current proposals of 'deducting' social costs from gross or net national product measurements will get us very far. For these attempts to incorporate new facts 'painlessly' into conventional theory[23] follow the classical pattern which Veblen once described as the typical response of traditional economics to new 'facts'. In an age of business enterprise, Veblen wrote, new facts and ideas will impose themselves upon the imagination of a wider audience of economists and practical men of affairs only if they are expressed in terms of business finance and the market test. Veblen felt that ingrained habits of thought, reflecting the predominant climate of opinion characteristic of a system of business enterprise, had a tendency of being transmitted from one generation of economists to the next as they were prone to do in the past, that is via 'institutions of higher learning'. For this reason, Veblen, in his time, regarded the prospects for a reconstruction of economics as dim.[24] Of course, Veblen knew what he was talking about; he knew from his own experience as an analyst and as a critic of the system of business enterprise that established theories resist any change and do not simply fade away because they are in conflict with empirical evidence.

However, since Veblen published his essay on economics in 'the calculable future' some fifty years ago, economic conditions have changed and the gap between theory and reality has widened. The deterioration of the environment constitutes a more fundamental challenge to the scope and method of traditional economics than anything that has happened before. In addition, practically all the great current problems (such as inflation, the increase of oil prices, unemployment, monetary disequilibria and balance-of-payments deficits, the population explosion and the scarcity of food as well as famines) are not only world-wide phenomena but call for new global approaches and solutions.

Moreover, these problems call for the formulation of specific goals and objectives and the selection and mobilisation of the necessary means (technologies, inputs, controls). It is true, unemployment may be 'remedied' by military and other expenditures even though the current inability to curb the inflationary impact of continuous public domestic and international deficits and the creation of new international 'liquidities' including the recycling of petro-dollars still present open and unsolved if not unsolvable problems within the framework of a 'market economy'. While unemployment may be reduced by an expansion of production, the degradation of the environment will increase with greater output unless alternative criteria of determining inputs and outputs as well as the choice of technology and of location are developed. For these reasons, the need for a reconstruction of economics under the impact of the current global crisis will increase and so will the pressure for a theoretical and methodological innovation of contemporary theories. While it is possible that the desire to retain the traditional doctrine may make the latter more and more dogmatic and give rise to a 'conceptual freeze',[25] it is not unlikely that this freeze will be broken in the calculable future under the impact of new facts, new evidence of environmental disruption, new catastrophes and an increasing public opposition to the deterioration of the physical and social environment.

Notes and References

1. Michael J. Perelman, 'Farming with Petroleum', *Environment*, vol. 14 (8) pp. 8–13 (Oct 1972).

2. It has been estimated that the Chinese wet-rice farmer gets for each unit of energy expended more than 50 units of energy in returns; 'for each unit of fossil unit of energy we expend in the U.S. we get about one fifth in return. On the basis of these two ratios, Chinese wet rice agriculture is far more "efficient" than our own system'; ibid. p. 12.

3. Luc Bigler, 'Zur Stagnation der "Grünen Revolution" – Sozioökonomische Hemmungsfaktoren in der Diffusion neuer Technologien in Entwicklungsländern dargestellt am Beispiel der Verwendung von High Yielding Varieties in der indischen Landwirtschaft', Basler dissertation, unpublished (1974).

4. Additional dollar returns from additional applications of pesticides are estimated to vary from $2·82 to $4–5 per dollar spent on pesticides; David Pimentel, 'Realities of a Pesticide Ban', *Environment*, vol. 15 (2) (Mar 1973) p. 25.

5. Perelman, 'Farming with Petroleum', p. 13.

6. Such as the use of parasites, pathogens, predators, chemical and physical attractants, sterile males and genetic manipulations. On this subject and some notable failures of pesticides to eradicate pests, including those causing malaria, see the work of the Commonwealth Institute of Biological Control with headquarters in Trinidad and various stations throughout the British Commonwealth plus a European station in Délémont (Switzerland) as well as the following publications: Hubert Pschorn-Walcher, 'Probleme der biologischen Bekämpfung eingeschleppter Pflanzenschädlinge', *Biologie in unserer Zeit*, 2 (June 1972) pp. 67–75; Richard Garcia, 'The Control of Malaria', *Environment*, 14, no. 5 (June 1972) pp. 2–9; Göran Lofroth, 'Who cares about DDT', *Ecologist*, 1, no. 17 (Nov 1971) pp. 8–9.

7. On the whole subject see Pimental, 'Realities of a Pesticide Ban', pp. 28–9.

8. R. L. Ackoff, 'Systems, Organizations and Interdisciplinary Research', *General Systems Yearbook*, vol. 5 (1960) p. 1.

9. Ibid. p. 1.

10. C. D. Darlington, *The Conflict of Society and Science* (London: Watts, 1948) quoted from John Dewey, *Reconstruction of Philosophy* (New York: Mentor, 1948) p. 14.

11. Ibid. p. 14.

12. As Darlington pointed out with references to new developments in the natural sciences, 'it is no accident that bacteria were first understood by a canal engineer, that oxygen was isolated by a Unitarian minister, that the theory of infection was established by a chemist, the theory of heredity by a monastic school teacher, and the theory of evolution by a man who was unfitted to be a university instructor in either botany or zoology', and, Darlington added, the great innovators 'are the first to fear and doubt their discoveries'; ibid. pp. 14–15.

13. René Dubos, 'Review of Barry Commoner, The Closing Circle', *Environment*, vol. 14, no. 1 (Jan–Feb 1972) p. 48.

14. In lieu of a detailed bibliography we must confine ourselves to listing a few key names: A. N. Whitehead, John Dewey, Joseph Needham, Thorstein Veblen, L. A. Kroeber, Gunnar Myrdal, L. von Bertalanffy. For further details cf. K. William Kapp, *Towards a Science of Man in Society* (The Hague: Nizlioff, 1961).

15. Cf. Alan Coddington, 'The Economics of Ecology', *New Society* (Apr 1970) pp. 595–7.

16. So far very little attention has been paid to these cumulative causal processes; the great exceptions are of course the institutionalists such as Veblen and Myrdal. For an analysis of their key concepts of circular interdependencies and cumulative causation within the context of economics as a subsystem of the socio-cultural institutional composite system, see K. William Kapp, 'In Defense of Institutionalism', *Swedish Journal of Economics*, vol. LXX, no. 1 (1968) pp. 1–18.

17. David W. Fischer, 'On the Problems of Measuring Environmental Benefits and Costs', *Social Science Information*, 13, 2 (1973) p. 104.

18. Ibid. p. 8. Cf. also H. H. Liebhafsky, *The Nature of Price Theory* (Homewood, Ill.: Dorsey, 1968) p. 266.

19. Cf. K. William Kapp, 'Social Costs, Neo-Classical Economists, Environmental Planning: A Reply', *Environmental Policies and Development Planning in Contemporary China and Other Essays* (Paris: Mouton, 1974) pp. 99ff.

20. For a distinction of social (including environmental) indicators and norms, see ibid. pp. 127–38.

21. This brings our notion of normative economics close to that of political economics: the theory of controlled economic systems as developed by Adolf Loewe, *Economic Knowledge* (New York: Harper & Row, 1965); Cf. also R. L. Heilbronner, 'On the Possibility of Political Economics', *Journal of Economic Issues*, IV, 4 (1970) and François Hetman, *Society and the Assessment of Technology* (Paris: O.E.C.D., 1973) pp. 379–90, esp. p. 389.

22. For a formal demonstration of this incompatibility, see David Pearce, 'An Incompatibility in Planning for a Steady State and Planning for Maximum Economic Welfare', *Environment and Planning*, vol. 5 (1973) pp. 267–71; and, by the same author, 'Economics and Ecology', *Survey Papers in Economics*, no. 10 (1974).

23. 'L'écologie est intégrée sans douleur par la théorie néo-classique et la Nature devient un secteur économique susceptible d'être comptabilisé dans les schémas rassurants de l'équilibre'. Jan Dessau, 'Modèles dualistes de l'Environnement et Choix de Techniques'; paper presented at Symposium International, Analyse socio-économique de l'Environnement, Problèmes de Méthodes, Grenoble Conférence, mimeo. (1972) p. 8.

24. 'Loosely speaking, no argument on economic matters will get a reasonable wide hearing until it is set out as a "business proposition" in terms drawn from the conduct of business administration, business finance, national trade, salesmanship and publicity', Thorstein Veblen, 'Economic Theory in the Calculable Future', *American Economic Review*, vol. XV, no. 1, supplement (Mar 1925) p. 53.

25. J. J. Spengler, 'Economics: Its History, Themes, Approaches', *Journal of Economic Issues*, 2 (Mar 1968) p. 21.

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