

ECONOMICS

AND THE BEHAVIORAL SCIENCES:

A DESERT FRONTIER?

One of the important intellectual interests of American scholars and scientists at the present time is the movement toward greater integration of specialized fields and disciplines. The size of the movement must not be exaggerated—it concerns a small minority of scholars, and most specialists are still content to stay comfortably within the cosy walls of their own specialty. Nevertheless there is something which might be called an “interdisciplinary movement” in many areas of knowledge, and if the movement is occasionally more undisciplined than interdisciplinary, this can be charitably ascribed to growing pains.

Three sources of this movement can be distinguished. In the first place there is a certain dynamic process in the development of pure theory which tends toward the integration of different fields. Within each discipline there is a tendency for theory to become more and more general. It is one of the marks of a developing science that old theories can usually be seen as special cases of the newer theories. Thus, in physics, the Newtonian mechanics can be exhibited, I am told, as a special case of the theory of relativity. In economics the “classical” theory of Adam Smith and

Ricardo can be seen as a special case of modern theories of value and employment. It would not be surprising if the increase in generality of theory led to a breakdown of the conventional barriers between disciplines. This has already happened to a considerable extent in the physical sciences, and it is difficult these days to tell where physical theory leaves off and chemical theory begins. Concepts which used to be pure chemistry, like valency, now turn out to have a basis in atomic physics. We still do not have a unified theory of the machinery of life, but we seem to be advancing in this direction with increased knowledge of the physical and chemical accompaniments of life processes. In the social sciences psychoanalytic theory has made a profound impact on sociology and anthropology. Biological theories of the interaction of populations, of growth, of ecological succession, and of homeostasis have an impact on the social sciences, even on economics. Economic theory itself is surely a special case of a much more general theory of society, a general theory which is not quite explicit but which sometimes seems to be just around the corner. Cybernetics seems to offer a clue to the unification of many disciplines; information theory jumps from electrical engineering with a spark of excitement into the social sciences. So widespread is this movement that a new society to enshrine it is in process of formation, known at the moment as the "Society for the Advancement of General Systems Theory."

The second source of the interdisciplinary movement is closely related to the first. It is the development of what might be called "interstitial fields" between two or more old-established disciplines. In the natural sciences the rise of physical chemistry in the second half of the nineteenth century is a good example. Now it almost seems as if the hybrid threatens to displace both its parents. Similarly, the twentieth century has seen marked advances in biophysics and biochemistry. In the social sciences the rise of social psychology as a recognized discipline in the last generation parallels the rise of physical chemistry two generations earlier. Here too there seems to be some tendency for the hybrid offspring to gobble up the parents as the realization grows that society consists of the interaction of individuals, and that individuals cannot be understood apart from the society which grew and which nourishes them. Social anthropology likewise threatens to take over sociology on the one side and anthropology on the other.

The third source of interdisciplinary interest is the growth of specialized empirical and professional fields which utilize theoretical and conceptual material from more than one of the traditional disciplines. Thus, medicine

is a professional field which draws on the resources of all the physical sciences, and which is beginning to draw more and more on the social sciences. Many of the advances in biophysics and biochemistry have been stimulated by the demands and opportunities provided by medical and surgical practice. The recent rise to prominence of psychiatry, psychosomatic, and social medicine, with the recognition that the source of many diseases lies in the experiences, perceptions, and social environment of the patient, opens a door to many important developments in the social sciences. Engineering increasingly requires theoretical material drawn not only from the physical sciences but from the social sciences as well. Even in law, the most formal and isolated of the great professions, there is increasing interest in drawing on the resources of the various social sciences, though this movement is still in a very early stage. Other professions are likewise finding that the logic of their own professional activities forces them into a more integrated approach to their theoretical foundations. Social work has perhaps leaned too heavily on psychoanalysis, and needs to reach out to other social sciences. Architecture is awakening to the fact that buildings are made for people and must be built around patterns of behavior as well as engineering necessities. Schools of education, business, nursing, dentistry, and some others have not perhaps yet realized some of the opportunities for integrative research which are open to them. Their problems, however, involve more disciplines than they are often aware of.

Even more than in the “regular” professions, however, interest in interdisciplinary work arises in what might be called the “sub-professions,” those specialized branches of empirical study which may perhaps be on the way to becoming recognized professions, but which at present occupy a status somewhere between the full-fledged profession and the “pure” disciplines. Of these sub-professions the most striking example perhaps is industrial relations, an area of study which has had phenomenal growth in the past generation. It draws on economics, for it has to be interested in wage theory and employment theory. It draws even more on sociology for the study of the dynamics of labor organizations and labor-management relations. It draws on social psychology and group dynamics, especially in its study of small-group interactions. It is at least adjacent to the field of industrial psychology. International relations is another specialty which draws on many disciplines—economics, political science, anthropology. The study of economic development and culture change is forcing certain rapprochements between economics and anthropology. In the area of family relations we have a rapidly developing field which

draws its theoretical material from psychology, sociology, even from economics. The list is by no means exhaustive.

To these three sources of the interdisciplinary movement one should perhaps add a fourth—the stimulus given to the “behavioral sciences” by the Ford Foundation. It is not wholly clear even now what defines a behavioral science. The operational definition—a science which can get support from the Ford Foundation—perhaps illustrates the difficulties of operational definitions better than it defines a behavioral science. But if the edges of behavioral science are not altogether clear, this is probably as it should be—concepts should spread out from a center rather than be enclosed by a fence. And the center of the behavioral sciences, it is fairly clear, is social psychology. Social psychology and its two parent fields, sociology and psychology, are clearly within the fold. Social anthropology is hard to tell from sociology these days, and gets a first-class ticket. Physical anthropology (if there are any people left who go around measuring skulls) probably gets no ticket at all. Political science is divided: the students of political behavior, who are really social psychologists in disguise, come in as approximately full members. Political theorists and institutionalists are admitted only on promise of improvement. History of the traditional sort is barely allowed to peek in the back door. There is a certain tendency for those outside the behavioral sciences to be suspicious, and perhaps a little envious, of the support they have received. The impartial observer must admit, however, that the behavioral sciences are not merely a whim of the Ford Foundation, but that they do represent a certain core of disciplines and methods which have growing unity, and a certain common culture. The Ford Foundation’s support rests on an already existing movement, and while it no doubt encourages this movement, it has in no sense created it.

Up to this point I have not mentioned economics. The main task of this article, however, is to examine the relation of economics both to the general movement for the integration of knowledge and to the particular movement for unity in the behavioral sciences. It must be confessed that at least at first sight economics stands somewhat aloof from this general movement. Economics is an old, rather self-contained discipline. It has some claims, after all, to being the second oldest of the sciences, emerging in systematic form with Adam Smith in 1776, a century later than Newton but earlier than Dalton, Darwin, or Freud. Economists live in something of a world of their own, and do not, for the most part, feel any strong urges to communicate with or to learn from sociologists, psychologists,

and so on. Some attempts have been made to bring economics and psychology together,¹ but it cannot be claimed that there is any discipline of “economic psychology,” or of “economic sociology” corresponding in status to social psychology. There was a time when “political economy” was a respected name. In a sense, however, it was prematurely born and died in infancy. Economics had to escape from this entanglement with political science and develop an abstract discipline of its own in the middle of the last century—an escape which is symbolized by the very substitution of the older name “political economy” by the term “economics.” Only within the past few years has there been some revival of interest in what perhaps had better be called “economic politics”—an attempt to develop a unified view of the economic and political processes in society.² There have been some attempts to develop the study of economic anthropology.³ On the whole, however, anthropologists and economists have gone their separate ways with the minimum of contact, and even the current interest in the relation between culture change and economic development has not, as yet, produced any major theoretical integration.

The reasons for this relative isolation of economics lie partly in its history as an “old” discipline, inclined to be self-contained and indifferent or even hostile to the “upstarts,” and partly in the nature of the economist’s abstraction. The economist’s universe consists not of men but of commodities and the quantities associated with them—prices, outputs, stocks, consumptions, rates of interest, and so on. His data consists for the most part of time series of these variables. Economics is therefore a kind of astronomy of commodities, studying the movements and interrelations of these various time series, and if these movements are regular enough the incidental fact that commodities are moved by men can be neglected. Astronomers can, in similar fashion, neglect the question whether the planets are moved by angels, because whether they are so moved or not, angels are so delightfully regular in their behavior that they can be neglected, or at least replaced by differential equations. Unfortunately for the economist, however, men are not as regular in their motions as angels, and it is more difficult to replace them by equations. It may be worth while, therefore, to explore some possibilities of advance in this “desert

1. See especially George Katona, *Psychological Analysis of Economic Behavior* (New York, McGraw-Hill, 1951), and Albert Lauterbach, *Man, Motives and Money* (Ithaca, N.Y., Cornell University Press, 1954).

2. *Politics, Economics, and Welfare*, by R. A. Dahl and C. E. Lindblom (New York, Harper, 1953), represents a major attempt in this direction.

3. See M. J. Herskovitz, *Economic Anthropology* (New York, Knopf, 1952).

frontier” that lies between economics and the other social or behavioral sciences.

Part of the difficulties of this frontier, and one reason for the self-sufficiency of economics, lies in the fact that whereas economics organizes itself around a *level of abstraction*—the “commodity universe”—the other behavioral and social sciences tend more to organize themselves around various forms of *method of procedure*. It is not altogether easy to identify the various levels of abstraction at which the other behavioral sciences operate. We may say, for instance, that psychology centers around systems of stimulus and response, sociology around systems of interaction of persons, and anthropology around the study of simple static states of culture. Each of these propositions, however, would be disputed vigorously by many competent experts in the various fields and important counter-examples could easily be given. It is much easier to set up a classification of methods on which there would be fairly general agreement and which would cut across the traditional division into departments or disciplines. In examining the possible contribution of the behavioral sciences to economics, then, we will find it more fruitful to examine the contribution of the various methods, rather than the contribution of various disciplines. The four methods which I propose to consider are: (1) the experimental, (2) the observational, (3) the metrical, and (4) the clinical. These methods are not, of course, peculiar to the behavioral sciences. It can be claimed, however, that the behavioral sciences have been more self-critical and more self-conscious about their methods than any other group of sciences in recent years, and that all the sciences might do well to subject themselves to at least something of this process of self-examination.

The experimental method is a familiar one in science. It consists essentially in setting up and observing an artificial situation in which the variables are fewer and more subject to control than in “nature.” In the behavioral sciences it has been most employed by psychologists, especially animal psychologists. The rat threading his maze, the pigeon pecking for food, the monkey solving his problems, are the trade marks of this craft. Human subjects have not been lacking. Studies of perception and cognition owe much to experiment with humans, especially college sophomores. The processes of learning, the formation of mental images, and the whole complex interaction of stimulus and response have been subject to inquiry through experiment. The method has also been employed, with more difficulty but still with some success, by the social psychologist in the study of small groups. The tradition of Kurt Lewin and “group dy-

namics,” the fascinating studies of communication and interaction in small groups by Alex Bavelas, and the elaborate studies of group organization and behavior at the RAND Corporation are all examples of this method. Even in anthropology the experimental method is not entirely lacking. Cornell University, for instance, under the leadership of Allan Holmberg, is conducting what might be called a quasi-experiment in culture change in a whole community in the mountains of Peru, by keeping close watch on the effects of a planned series of innovations.

Up to the present, economics has been little influenced by the experimental method: it is difficult to get the banker or the corporation executive or even the housewife into a laboratory and subject them to simplified artificial economic situations to see what they would do. Nevertheless, there are some recent developments, for instance, in the theory of games, in decision theory, and in utility theory, which point toward certain possibilities of experimental verification. The phenomenon which is most subject to investigation here is that of choice under conditions of uncertainty. We can, for example, give subjects the choice between various outcomes, rewards, or punishments of varying degrees of probability and see whether their responses are consistent with various assumptions about utility functions. It may be doubted whether the results of these experiments will throw any startlingly new light on the processes of choice in the real world. Nevertheless, choice, or the decision-making process, especially under conditions of uncertainty, is so fundamental to the economic process, and is so little understood, that any light shed on it is welcome.

The observational method is again common to many sciences—astronomy, geology, the various branches of natural history, as well as the social sciences. It may be divided roughly into observations in space and observations through time, though all observational studies should ideally consist both of observations of variables, structures, and relationships existing at a *moment* of time and of records (time series) of these observations at regular intervals through time. In the behavioral sciences much sociology and most anthropology follows this method. Sociologists of the type of Max Weber draw upon historical record for their data, and derive their generalizations from careful study of this material. Sociologists of the questionnaire-interview school and anthropologists in their field work also rely almost exclusively on the observational method. Economics relies heavily on this method. If a distinction were to be drawn between its use in economics and in the other behavioral sciences, one might say that

economics is more interested in observation of variables through time (that is, in time series), whereas sociology and anthropology are more interested in observations in "space" of some kind. The space need not be geographical space—it may be one of many "social spaces" or "sample spaces," but the main interest is in the structure and relationships of variables as they exist at a moment, or through a fairly brief interval of time. One might say also that economics is more interested in variables which are capable of fairly exact quantitative measurement, whereas sociology and anthropology are more interested in qualitative descriptions and relationships. A third possible distinction is that economics is apt to be content with data obtained as a by-product of social processes which have other main objectives. Thus, much economic information comes as a by-product of tax systems—income data, for example, from the income tax, and trade data from customs. The behavioral sciences on the other hand are less apt to be satisfied with "by-product" data and have developed many ingenious methods for the deliberate and careful collection of information.

It must be emphasized that these distinctions are very rough, and important exceptions could be found to all of them—they define foci of interest rather than clear boundaries. Furthermore, in part under the stimulus of the "interdisciplinary movement" these distinctions are breaking down. One of the most important developments in economics in the past ten or fifteen years has been a great development of specialized data-collection, especially through the survey method. The Survey Research Center at the University of Michigan, for instance, conducts at regular intervals an elaborate survey of consumer finances. Thus, the economist no longer has to rely on data drawn from the haphazard, but unfortunately not random, processes of the tax and customs system, but has an independent source of information carefully designed to yield the maximum of information per unit cost. Sociologists and anthropologists are getting more aware of the importance of time series, and there has been some growth of "longitudinal" studies which follow a certain situation through many years. Much remains to be done in this connection, however, and it is perhaps the greatest weakness of these sciences that they have too many "one-shot" studies relating to a particular time and place, and that the information gathered does not feed into a continuing time series in the way that most economic information does. It is hard to overestimate, for instance, the importance for economics of the *continuous* collection of national income data which has been going on now for twenty-five years or more. There is nothing like this, as yet, in the other social sciences. In

economics we have a reasonably clear and accurate picture of the over-all magnitudes of the economy and a picture of how these magnitudes proceed through time. Current data is always seen as the last element of a long time series, and this gives it a richness and significance which it would not otherwise possess. In the other social sciences each piece of information tends to stand alone, without reference to any over-all picture either in time or in space.

The third method which may be distinguished is the metrical method. This is in a sense a subdivision of the observational method, but it has so many characteristics of its own that it is perhaps worth a separate heading. In the past generation or so there has grown up in many different disciplines an interest in quantification, in indices, in exact measurement of variables, and in the attempt to discover stable functional relationships among these variables by methods involving fairly advanced mathematical and statistical technique. So widespread is this movement that it might almost be identified as a "metrics" movement. Thus, in economics we have seen the rise of econometrics; in psychology, psychometrics; in biology, biometrics; and even in sociology, sociometrics. The curious thing about this movement, however, is that it is in the main one of isolated and unrelated disciplines. In spite of the fact that it uses the one basic language of mathematics, the metrics movements in the various disciplines have been surprisingly isolated, largely unaware of each other's work, and have remained for the most part within the framework of their respective disciplines. Thus, psychometrics has developed mainly around the problem of psychological testing. Its main tools have been correlation and factor analysis; its main interest has been the identification of stable traits or elements in test performance. Sociometrics is perhaps the least successful, or perhaps one should say respectable, of the various metrics. Its focus of interest has been in the quantification of distributions and of spatial relationships. Econometrics has undergone a phenomenal growth in the past twenty-five years, and has had a significant impact on theory and practice in economics. Its main focus of interest is the identification of stable functional relationships among economic variables, such as demand and supply functions, consumption functions, and so on. It is also interested in discovering stable difference equations among economic variables with a view to the possibilities of predicting their time course. The next few years may bring considerable convergence among these various metrics. They share many basic mathematical and statistical tools, and many of the basic models may turn out to be more closely related than is

now apparent. Thus, models of learning in psychology attempt to relate time series of stimuli and responses: this is not wholly unrelated to the problem of economic dynamics, which also seeks to relate “earlier” to “later” variables in stable difference equations.

The fourth method of the behavioral sciences is the clinical method. Psychoanalysis is the chief monument of this method. It is used, however, in clinical psychology, in social work, in criminology, in town planning. The emphasis here is on the “cure” of a pressing practical problem. In one sense we may say that this also is an example of the observational method. The observations in this case, however, are of “cases”—that is, of situations which have some degree of morbidity, and they are directed mainly toward prescription of remedies. Verification comes, if at all, from the further observation of the effects of the remedies prescribed. In spite of the biased sample and the unsystematic nature of the verification processes, much has been learned from clinical observation, and a good deal of the theoretical structure of the behavioral sciences stems from data derived by this method. The impact of psychoanalytic theory on all the behavioral sciences has been great, even where it has not been accepted as quite scientifically respectable. The theory of personality and of motivation has been largely drawn from psychoanalytic sources. Cultural anthropology has also been deeply influenced by psychoanalytic theory in its theories of the mutual interaction of culture and personality, of the importance of child rearing customs on the dynamics of cultural preservation or change, and so on.

Economics has been affected very little by the clinical method, and practically not at all by psychoanalytic theory. Economic man had no parents and never was a child. The interest of economics focuses on rational, conscious, and reflective behavior rather than on irrational and subconsciously motivated behavior. Nevertheless, there are areas in economics, such as the field of labor relations, where not only is a clinical approach possible, but where psychoanalytic theory also has considerable relevance. One does not need to go all the way and confine labor relations to the discussion of the employer as the father image or to attribute labor disputes to the unsatisfactory love of foremen, but one can still admit that the industrial relationship is not a purely economic relationship and that there are usually more things in dispute than wages and hours. It may be also, as Lauterbach has suggested, that childhood experiences in depression affect the outlook of the decision-makers of the next generation, and that this may account for something of a long cycle in economic affairs. There

is so little direct evidence for this proposition, however, that it cannot be awarded higher status than that of an interesting but unproved notion.

It is clear that the frontier between economics and the behavioral sciences is by no means wholly desert. It is true that beyond the safe departmental boundaries the ear is unusually sensitive to the voice of the Windy Platitude, and what is glimpsed around the corner of the sagebrush is frequently only the Obvious. It is true also that professional hazards are unusually high for the traveler, and academic rewards are more likely to go to those who stay at home and cultivate their departmental gardens rather than to those who venture forth on interdisciplinary territory. The economic psychologist is apt to find himself regarded as a psychologist by the economists and as an economist by the psychologists, and is pushed out from both departmental cases, and the same is apt to be true of any hybrid specialist, unless, like the social psychologist, he can get together with his kind and establish an intermediary oasis of his own. Nevertheless, the desert is irrigable, especially by the welcome springs which flow from the foundations, and under, these circumstances it may turn out to have astonishing reserves of intellectual fertility.

Irrigation, however, always raises the awkward question of which desert should be irrigated—assuming what is usually the case, that water is scarce. One may raise therefore a final awkward question—whether there are not other interdepartmental deserts which would be even more fruitful under irrigation than the one which stretches between economics and the other behavioral sciences. There is some evidence that it is not always interaction between closely related sciences which produces the most fruitful results, but that frequently hybrid vigor results from the crossing of two highly unrelated parent stocks. One should certainly not assume that it is only from the social sciences that economics will learn new tricks, and there are signs of fruitful interactions outside the traditional framework of the social sciences. One of the most exciting theoretical developments of the past ten years, for instance, has been the rise of information theory, which originated—and one cannot help expressing a little surprise—in electrical and communications engineering. Up to the present the impact of information theory on economics has been small. It is clear, however, that we are never going to solve the problem of economic dynamics unless we know something of how economic information—or more generally, information relative to economic decisions—is transmitted around the system. The particular abstract concept which the communication engineers have called “information”—which is simply a convenient

measure of the improbability of the symbols in a message—may not be a suitable abstraction for this problem, but at least economists are being stimulated by these developments to re-think the problem of information in their own discipline. We have gone too long in economics on the assumption that economic man never has to learn anything—that he is somehow mysteriously equipped from birth with all the knowledge necessary to rational behavior. Under assumption of perfect competition, where all economic man has to know is a set of prices which he can see plainly with the naked eye, it may well be that information or learning concepts are unnecessary. The introduction of imperfect competition into economics, however, means that poor old economic man now has to know all sorts of complicated relationships like demand and cost functions (and much worse things in game theory!) if he is to behave “rationally,” and how he gets to know these mysterious facts of his environment nobody ever asks. Once we abandon the assumption of perfect competition, then, the problem of the place of information and learning processes in economic behavior cannot be avoided.

Of more immediate importance to economics than information theory are certain developments in a rather ill-defined field which might be called the “theory of organization.” Some of this comes out of the biological sciences, in the notion of homeostasis and homeostatic mechanisms—those beautiful and subtle devices which regulate the constancies of the body—its temperature, blood pressure, and chemical and biological composition. The union of biology and electrical engineering produced cybernetics, the science of steersmanship, or of control mechanisms, so ably developed by Norbert Wiener.⁴ From this and various other sources, some from outside of traditional economics, some from inside, comes the lusty new discipline—which its enemies would describe as a cult—of “operations research” and “management science.” Mathematicians and even philosophers have been taking an increasing interest in problems which economists used to think were their private property. The theory of games comes out of a liaison between pure mathematics as embodied in Von Neumann and economics as embodied in Morgenstern.⁵ It is basically an attempt to define the nature of rational behavior under conditions of uncertainty of various kinds and degrees, in an environment which includes other “rational” beings with whom various agreements

4. Norbert Wiener, *Cybernetics* (New York, Wiley, 1948).

5. J. Von Neumann and O. Morgenstern, *The Theory of Games and Economic Behavior* 3rd ed. (Princeton, N.J., Princeton University Press, 1953).

may or may not be made, and where all the participants abide by some minimum set of rules. The theory of games has stimulated renewed interest in utility theory because of the necessity of finding some measure of the “pay-offs” involved in various strategies. Philosophers and logicians vie with each other in devising axiomatic systems which will permit the construction of a utility function, while the poor economist looks on in some amazement, not quite knowing whether to be flattered or insulted. Just what will come out of all this ferment is hard to predict, but there is at least a good deal of intellectual excitement even if as yet the fruits seem to be largely a matter of promise.

Finally, it is my personal conviction, not perhaps shared by many other economists, that there is an important field of interdisciplinary advance between economics and the biological sciences. There are two grounds for believing this. The first is that there is a certain similarity in the theoretical problems of the two sciences. The problem of the “ecosystem”—the community of living organisms—in biology has many similarities with that of the price system in economics, and the idea of history as an ecological succession of temporary equilibria is fruitful and attractive. The biological organism and the social organization also show marked similarities. The great processes of metabolism (exchange), growth, internal transformations, homeostasis, information, and entropy exchange operate in both social and biological bodies, and it is not unreasonable to hope that a general theory of organization is possible which would serve as a first-approximation model for cells, animals, firms, states, and societies. This is not to say that a single theory can cover all these diverse organisms and organizations—the introduction of consciousness into the model, for instance, makes a profound modification. Nevertheless, it helps in the systemization of thought if these organizations can be placed in something like a continuum of increasing complexity.

The second possibility of interaction between economics and biology is at a more practical level. Economists are apt to forget that man is part of a complex biological system and that this imposes certain limitations on him. Biologists, on the other hand, especially those interested in conservation, are apt to forget that man is more than a biological species, in that he is capable of communication, learning, and problem solving on a scale far beyond the capacity of any other form of life. Somewhere between the economic naïveté of the conservationists and the biological naïveté of the economists it should be possible to establish a solid “inter-discipline” of economic biology which would take account of both char-

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acteristics of man—his biological base as a member of an ecosystem and his rational aspirations as an intelligent being.

If the reader is confused by the picture I have given, he is merely reflecting the realities of the situation. Nevertheless, even though the situation is confusing, it is also exciting. We live in a time of many intellectual frontiers. Some of these may turn out to be deserts. But many are capable of permanent academic settlements, and the crazy men and adventurers of today may be the classicists and the founding fathers of a respectable tomorrow.