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SCIENCE AND HUMAN BEHAVIOUR

THE POSSIBILITY OF A SCIENCE OF HUMAN BEHAVIOR

BEHAVIOR AS A SCIENTIFIC SUBJECT MATTER

Behavior is not one of those subject matters which become accessible only with the invention of an instrument such as the telescope or microscope. We all know thousands of facts about behavior. Actually there is no subject matter with which we could be better acquainted, for we are always in the presence of at least one behaving organism. But this familiarity is something of a disadvantage, for it means that we have probably jumped to conclusions which will not be supported by the cautious methods of science. Even though we have observed behavior for many years, we are not necessarily able, without help, to express useful uniformities or lawful relations. We may show considerable skill in making plausible guesses about what our friends and [p. 15] acquaintances will do under various circumstances or what we ourselves will do. We may make plausible generalizations about the conduct of people in general. But very few of these will survive careful analysis. A great deal of unlearning generally takes place in our early contact with a science of behavior.

Behavior is a difficult subject matter, not because it is inaccessible, but because it is extremely complex. Since it is a process, rather than a thing, it cannot easily be held still for observation. It is changing, fluid, and evanescent, and for this reason it makes great technical demands upon the ingenuity and energy of the scientist. But there is nothing essentially insoluble about the problems which arise from this fact.

Several kinds of statements about behavior are commonly made. When we tell an anecdote or pass along a bit of gossip, we report a *single event*—what someone did upon such and such an occasion: "She slammed the door and walked off without a word." Our report is a small bit of history. History itself is often nothing more than similar reporting on a broad scale. The biographer often confines himself to a series of episodes in the life of his subject. The case history, which occupies an important place in several fields of psychology, is a kind of biography which is also concerned mainly with what a particular person did at particular times and places: "When she was eleven, Mary went to live with her maiden aunt in Winchester." Novels and short stories may be thought of as veiled biography or history, since the ingredients of even a highly fanciful work of fiction are somehow or other taken from life. The narrative reporting of the behavior of people at particular times and places is also part of the sciences of archeology, ethnology, sociology, and anthropology.

These accounts have their uses. They broaden the experience of those who have not had firsthand access to similar data. But they are only the beginnings of a science.

No matter how accurate or quantitative it may be, the report of the single case is only a preliminary step. The next step is the discovery of some sort of *uniformity*.

When we tell an anecdote to support an argument, or report a case history to exemplify a principle, we imply a general rule, no matter [p. 16] how vaguely it may be expressed. The historian is seldom content with mere narration. He reports his facts to support a theory—of cycles, trends, or patterns of history. In doing so he passes from the single' instance to the rule. When a biographer traces the influence of an early event upon a man's later life, he transcends simple reporting and asserts, no matter how hesitantly, that one thing has caused another.

Fable and allegory are more than storytelling if they imply some kind of uniformity in human behavior, as they generally do. Our preference for "consistency of character" and our rejection of implausible coincidences in literature show that we expect lawfulness. The "manners" and "customs" of the sociologist and anthropologist report the *general* behavior of groups of people.

A vague sense of order emerges from any sustained observation of human behavior. Any plausible guess about what a friend will do or say in a given circumstance is a prediction based upon some such uniformity. If a reasonable order was not discoverable, we could scarcely be effective in dealing with human affairs. The methods of science are designed to clarify these uniformities and make them explicit. The techniques of field study of the anthropologist and social psychologist, the procedures of the psychological clinic, and the controlled experimental methods of the laboratory are all directed toward this end, as are also the mathematical and logical tools of science.

Many people interested in human behavior do not feel the need for the standards of proof characteristic of an exact science; the uniformities in behavior are "obvious" without them. At the same time, they are reluctant to accept the conclusions toward which such proof inescapably points if they do not "sense" the uniformity themselves. But these idiosyncrasies are a costly luxury. We need not defend the methods of science in their application to behavior. The experimental and mathematical techniques used in discovering and expressing uniformities are the common property of science in general. Almost every discipline has contributed to this pool of resources, and all disciplines borrow from it. The advantages are well established.[p. 17]

SOME OBJECTIONS TO A SCIENCE OF BEHAVIOR

The report of a single event raises no theoretical problems and comes into no conflict with philosophies of human behavior. The scientific laws or systems which express uniformities are likely to conflict with theory because they claim the same territory. When a science of behavior reaches the point of dealing with lawful relationships, it meets the resistance of those who give their allegiance to prescientific or extrascientific conceptions.

The resistance does not always take the form of an overt rejection of science. It may be transmuted into claims of limitations, often expressed in highly scientific terms. It has sometimes been pointed out, for example, that physical science has been unable to maintain its philosophy of determinism, particularly at the subatomic level. The Principle of Indeterminacy states that there are circumstances under

which the physicist cannot put himself in possession of all relevant information: if he chooses to observe one event, he must relinquish the possibility of observing another. In our present state of knowledge, certain events therefore appear to be unpredictable. It does not follow that these events are free or capricious. Since human behavior is enormously complex and the human organism is of limited dimensions, many acts may involve processes to which the Principle of Indeterminacy applies. It does not follow that human behavior is free, but only that it may be beyond the range of a predictive or controlling science. Most students of behavior, however, would be willing to settle for the degree of prediction and control achieved by the physical sciences in spite of this limitation. A final answer to the problem of lawfulness is to be sought, not in the limits of any hypothetical mechanism within the organism, but in our ability to demonstrate lawfulness in the behavior of the organism as a whole.

A similar objection has a logical flavor. It is contended that reason cannot comprehend itself or—in somewhat more substantial terms— that the behavior required in understanding one's own behavior must be something beyond the behavior which is understood. It is true that knowledge is limited by the limitations of the knowing organism.

[p. 18] The number of things in the world which might be known certainly exceeds the number of possible different states in all possible knowers, But the laws and systems of science are designed to make a knowledge of particular events unimportant. It is by no means necessary that one man should understand all the facts in a given field, but only that he should understand all the *kinds* of facts. We have no reason to suppose that the human intellect is incapable of formulating or comprehending the basic principles of human behavior—certainly not until we have a clearer notion of what those principles are. The assumption that behavior is a lawful scientific datum sometimes meets with another objection.

Science is concerned with the general, but the behavior of the individual is necessarily unique. The "case history" has a richness and flavor which are in decided contrast with general principles. It is easy to convince oneself that there are two distinct worlds and that one is beyond the reach of science. This distinction is not peculiar to the study of behavior. It can always be made in the early stages of any science, when it is not clear what we may deduce from a general principle with respect to a particular case. What the science of physics has to say about the world is dull and colorless to the beginning student when compared with his daily experience, but he later discovers that it is actually a more incisive account of even the single instance. When we wish to deal effectively with the single instance, we turn to science for help. The argument will lose cogency as a science of behavior progresses and as the implications of its general laws become clear. A comparable argument against the possibility of a science of medicine has already lost its significance. In *War and Peace,* Tolstoy wrote of the illness of a favorite character as follows:

> Doctors came to see Natasha, both separately and in consultation. They said a great deal in French, in German, and in Latin. They criticised one another, and prescribed the most diverse remedies for all the diseases they were familiar with. But it never occurred to one of them to make the simple reflection that they could not understand the disease from which Natasha was suffering, as no single disease can be fully understood in a living person; for

> every living person has his individual peculiarities and always has his own peculiar, new, complex complaints unknown to medicine—not a disease of the lungs, of the kidneys, of the skin, of the heart, and so on, [p. 19] as described in medical books, but a disease that consists of one out of the innumerable combinations of ailments of those organs.

Tolstoy was justified in calling every sickness a unique event. Every action of the individual is unique, as well as every event in physics and chemistry. But his objection to a science of medicine in terms of uniqueness was unwarranted. The argument was plausible enough at the time; no one could then contradict him by supplying the necessary general principles. But a great deal has happened in medical science since then, and today few people would care to argue that a disease cannot be described in general terms or that a single case cannot be discussed by referring to factors common to many cases. The intuitive wisdom of the old-style diagnostician has been largely replaced by the analytical procedures of the clinic, just as a scientific analysis of behavior will eventually replace the personal interpretation of unique instances. A similar argument is leveled at the use of statistics in a science of behavior. A prediction of what the *average* individual will do is often of little or no value in dealing with a particular individual. The actuarial tables of life-insurance companies are of no value to a physician in predicting the death or survival of a particular patient. This issue is still alive in the physical sciences, where it is associated with the concepts of causality and probability. It is seldom that the science of physics deals with the behavior of individual molecules, atoms, or subatomic particles. When it is occasionally called upon to do so, all the problems of the particular event arise. In general a science is helpful in dealing with the individual only insofar as its laws refer to individuals. A science of behavior which concerns only the behavior of groups is not likely to be of help in our understanding of the particular case. But a science may also deal with the behavior of the individual, and its success in doing so must be evaluated in terms of its achievements rather than any a priori contentions.

The extraordinary complexity of behavior is sometimes held to be an added source of difficulty. Even though behavior may be lawful, it may be too complex to be dealt with in terms of law. Sir Oliver Lodge once asserted that "though an astronomer can calculate the orbit of a planet or comet or even a meteor, although a physicist can deal with [p. 20] the structure of atoms, and a chemist with their possible combinations, neither a biologist nor any scientific man can calculate the orbit of a common fly." This is a statement about the limitations of scientists or about their aspirations, not about the suitability of a subject matter. Even so, it is wrong. It may be said with some assurance that if no one has calculated the orbit of a fly, it is only because no one has been sufficiently interested in doing so. The tropistic movements of many insects are now fairly well understood, but the instrumentation needed to record the flight of a fly and to give an account of all the conditions affecting it would cost more than the importance of the subject justifies. There is, therefore, no reason to conclude, as, the author does, that "an incalculable element of self-determination thus makes its appearance quite low down the animal scale." Selfdetermination does not follow from complexity. Difficulty in calculating the orbit of the fly does not prove capriciousness, though it may make it impossible to prove anything else. The problems imposed by the complexity of a subject matter must be dealt with as they arise. Apparently hopeless cases often become manageable in time. It is only recently

that any sort of lawful account of the weather has been possible. We often succeed in reducing complexity to a reasonable degree by simplifying conditions in the laboratory; but where this is impossible, a statistical analysis may be used to achieve an inferior, but in many ways acceptable, prediction. Certainly no one is prepared to say now what a science of behavior can or cannot accomplish eventually. Advance estimates of the limits of science have generally proved inaccurate. The issue is in the long run pragmatic: we cannot tell until we have tried.

Still another objection to the use of scientific method in the study of human behavior is that behavior is an anomalous subject matter because a prediction made about it may alter it. If we tell a friend that he is going to buy a particular kind of car, he may react to our prediction by buying a different kind. The same effect has been used to explain the failures of public opinion polls. In the presidential election of 1948 it was confidently predicted that a majority of the voters would vote for a candidate who, as it turned out, lost the election. It has been asserted that the electorate reacted to the prediction [p. 21] in a contrary way and that the published prediction therefore had an effect upon the predicted event. But it is by no means necessary that a prediction of behavior be permitted to affect the behaving individual. There may have been practical reasons why the results of the poll in question could not be withheld until after the election, but this would not be the case in a purely scientific endeavor.

There are other ways in which observer and observed interact. Study distorts the thing studied. But there is no special problem here peculiar to human behavior. It is now accepted as a general principle in scientific method that it is necessary to interfere in some degree with any phenomenon in the act of observing it. A scientist may have an effect upon behavior in the act of observing or analyzing it, and he must certainly take this effect into account. But behavior may also be observed with a minimum of interaction between subject and scientist, and this is the case with which one naturally tries to begin.

A final objection deals with the practical application of a scientific analysis. Even if we assume that behavior is lawful and that the methods of science will reveal the rules which govern it, we may be unable to make any technological use of these rules unless certain conditions can be brought under control. In the laboratory many conditions are simplified and irrelevant conditions often eliminated. But of what value are laboratory studies if we must predict and control behavior where a comparable simplification is impossible? It is true that we can gain control over behavior only insofar as we can control the factors responsible for it. What a scientific study does is to enable us to make optimal use of the control we possess. The laboratory simplification reveals the relevance of factors which we might otherwise overlook. We cannot avoid the problems raised by a science of behavior by simply denying that the necessary conditions can be controlled. In actual fact there is a considerable degree of control over many relevant conditions. In penal institutions and military organizations the control is extensive. We control the environment of the human organism in the nursery and in institutions which care for those to whom the conditions of the nursery remain necessary in later life.

[p. 22] Fairly extensive control of conditions relevant to human behavior is maintained in industry in the form of wages and conditions of work in schools in the

form of grades and conditions of work, in commerce by anyone in possession of goods or money, by governmental agencies through the police and military, in the psychological clinic through the consent of the controllee, and so on. A degree of effective control not so easily identified, rests in the hands of entertainers, writers advertisers, and propagandists. These controls, which are often al too evident in their practical application, are more than sufficient to permit us to extend the results of a laboratory science to the interpretation of human behavior in daily affairs—for either theoretical or practical purposes. Since a science of behavior will continue to increase the effective use of this control, it is now more important than ever to understand the processes involved and to prepare ourselves for the problems which will certainly arise.