

## Causality versus Indeterminism

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When Adler first presented his ideas about the purposiveness of human behavior, (1) he encountered considerable suspicion and even disdain on the part of psychiatrists and physicians. Their objections were even more intense against Adler's assumption that it is the individual himself who sets his own goals. True enough, Adler had followed in the footsteps of recent developments in science. The Neo-Vitalists had asserted in the latter part of the nineteenth century that pathology must be recognized in its purpose; pathological conditions are defense mechanisms which the body develops against pathogenic agents of any kind. A typical example is fever. Previously it had been considered merely as the effect of an inflammatory agent; now it was recognized as a means to fight off harmful intruders like bacteria, viruses, etc.

Still, two factors undoubtedly led to the critical attitude, approaching contempt, in which Adler's "unscientific" ideas were held. One was the mechanistic-deterministic trend in modern science which made the mechanistic theories of Freud much more palatable, despite the first violent reaction against their sexual emphasis. The second objection against Adler's assumption was a direct outgrowth of the first. Because of its deterministic character, throughout the ages science has been opposed to the assumption of a free will, which the Church had postulated to substantiate its claim that man is responsible for his actions. Had Adler gone back to the mystic thinking of a pre-scientific era? Many found a confirmation of this suspicion when Adler went so far as to introduce "guessing" as a means of scientific research. It seemed as if the "bottom would fall out" under the hard-won position of psychology as a science. Bergson's philosophy with its recognition of a vital force, the *élan vital*, as being self-determining, had hardly penetrated natural science or any other area of scientific investigation.

Much progress has taken place in science since the early Twenties when Adler reached the final formulation of his theories. One can well say that the trend of scientific thinking during the last half century has

turned entirely in the direction which Adler indicated. His position has been confirmed in various areas of scientific research which had nothing to do with psychology. And in psychology itself he is constantly being rediscovered. As a matter of fact, a great deal of the progress upon which psychoanalysts pride themselves is based upon a moving away from Freud's biologic orientation toward the position which Adler took forty years ago. Today his basic assumptions can no longer be considered "unscientific"; on the contrary, they present the most modern aspects of scientific thinking.

It must be admitted that the advances which science made during this period and which amount to no less than a revolution in thinking have not yet reached the level of the average scientific worker. It is now about fifty years since Planck came forth with his Quantum Theory which revolutionized physical science, without its originator having the slightest idea that he had inaugurated a new phase of scientific development. Today, physics, chemistry, astronomy and natural sciences in general have completely accepted this new perspective; but the scientific orientation even of the well educated public shows no sign of this trend. Most college students have hardly heard about the Quantum Theory, and few know what it means. No wonder that physicians and psychiatrists have so far hardly been touched by this new trend in thinking. This is why the question of Causality versus Indeterminism is still puzzling to most and why it creates a somewhat uneasy feeling whenever it is mentioned.

The mechanistic approach is clearly based on the causal principle. Every event must have its cause, which explains it completely. On the strength of this principle science has made its tremendous progress. There can be no doubt that this form of thinking, which alone is considered as scientific and which is in contrast to the previously prevalent form of mystical thinking, constitutes a significant advance in the development of mankind. As long as man believed events were caused by mystical and supernatural forces, he had no direct influence over events, except by addressing himself to these mystical and superior powers. Only by studying the causes could man learn to inject himself into events by influencing and changing the material causes.

It was rather late in human history, about 600 B.C., when scientific thinking was generally established. Although the Assyrians and Egyptians made important scientific contributions before this time, particularly in the field of astronomy, their thinking in all other fields of life was not scientific, but mystical. Nature was not explained internally,

without reference to external agents, and mythology sufficed to satisfy the urge for explanation of events. Observation and analysis, characteristic for the scientific approach, started with the early Greeks, particularly with Thales. It reached its peak about three hundred years later, through Plato and Aristotle, who shifted the interest from the natural world to the world of man. Philosophy focused its interest on reason, science on observation. Aristotle integrated both into one body of knowledge. While scientific evolution stopped, and even regressed into mystical thinking during the Middle Ages, the basic scientific postulations reached by the Greeks remained as the basis for logic and technique, although often distorted and misinterpreted. Only after the Renaissance, when the trends of the ancient culture were taken up again, was the scientific way of thinking firmly established. Particularly during the last few hundred years has the mechanistic and analytic approach brought mankind to unheard of accomplishments by increasing knowledge and the ability to use it.

This phase of scientific evolution is now coming to an end. There is no danger that mankind will revert again to a mystical thinking. But the mechanistic, deterministic approach has led to findings which seem to indicate its limitations. It is probably more than a coincidence that this revolution in thinking should take place at the same time that the structure of our society is undergoing change. Cultural and social changes have always been accompanied by changes in the ideological superstructure, not only in the way of living, but also in the way of thinking. And in our time we discover not only the freedom of man in our rapidly progressing democratization, but also the freedom of the electron in nature! This freedom is less attributed to a divine power in the universe than to the existence of a life energy which has been called psychic, although this term is certainly misleading. We find a peculiar convergence of opinion between physicists and psychiatrists, when Eddington, the physicist, states, "The substratum of everything is of mental character. Mind is the first and most direct thing in our experience and all else is remote inference"; (4) and Morton Prince, (5) the psychiatrist, considers electricity and energy as "the mode in which the immaterial reality of the brain process is apprehended. The mind is the immaterial spiritual energy; the units of the immaterial in their complexity form the body." It seems to make little difference, then, whether one speaks of mind or of energy; both formulations indicate the same basic force, in the universe as well as in man. And this force is free; it cannot be caught by a deterministic principle of

cause and effect. This emerging concept is somewhat different from the position taken by the old Vitalists, who still presupposed some mystical or supernatural power behind natural events. Research in physics gives these assumptions more scientific validity.

When energy was recognized as the root of all matter, far-reaching changes took place in the concept of matter, life, and the universe. We begin to realize why the causal principle has been accepted as the basic principle in nature. It was borne out by observation and experimentation. Scientists merely failed to realize before, that the determining cause exists only in mass phenomena. Consequently, the term "determinism" is replaced today in physical science by the term "statistical probability." Only when we are dealing with large numbers is the effect of a given cause so probable that it almost becomes a certainty. But when we are able to see the smallest unit, we also realize its independence from determining factors. A great number of electrons, shot in a certain direction, will meet the target; but some will stray far away without any indication that they are "forced" into their course by any outside influence. The number of these deviations may be so small that they have no practical significance. But the significance lies in the new principle which has been recognized through this trivial deviation. A simple example may demonstrate this fact. Newton's law of gravity explained the movement of the stars sufficiently to permit adequate calculations and predictions. But Einstein's relativity theory was needed to explain the small and insignificant deviations of celestial movement, which could not be explained by the theory of gravity.

Many examples to demonstrate the significance of the contrast between mass and single unit can be found if we look at man either as a member of a group or as an individual. For instance, the number of suicides in any given population can be pretty accurately predicted for the coming year. Various factors have been established as either increasing or decreasing this percentage. The cost of grain and general economic factors are positively correlated with the number of suicides; i.e., when the costs go up, the percentage increases. Other factors like political unrest, war and the like, decrease the percentage. But despite the amazingly accurate predictability of the number of suicides, it is utterly impossible to predict with any amount of certainty whether any one individual will or will not commit suicide during the next year.

Any person with deterministic orientation would be inclined to assume that one could eventually know enough about the factors

operating in an individual to permit such prediction. This assumption is in line with the dream of the eighteenth and nineteenth century scientists who hoped that increasing knowledge would eventually make man omniscient. If we could know all the forces which are now in operation, we should then be able to predict everything that will happen. If the relationship of cause and effect were really as reliable as was assumed, such assumption would be justifiable. Today we know better. The law of uncertainty as established by Heisenberg shatters these dreams forever. It is no longer a question of perfecting the tools of observation and examination. It is not the frailty of the human creature which prevents complete and full knowledge. The recognition of the limitations in knowledge is based on more fundamental considerations. It is the inevitable subjectivity which interferes with absolute findings and permits only an approximate knowledge. Kant's "*Ding an sich*," the objective thing in itself, is dead, at least for human perception. Reality takes on a new form. While we cannot doubt that reality exists, we as human beings can perceive of it only in our subjective way, from our own point of view, with our own bias. And we, therefore, are the final judges of what we *think* is reality.

In this light, Adler's emphasis on "guessing" as a method of investigation appears almost as a prophetic foresight, particularly since he indicated that one can learn to guess "in the right direction." On the strength of knowledge and factual information we can put our creative imagination to good use. Both the realization of creativeness and its use for deduction negate and transcend the usual scientific emphasis on causal determination. What has been considered as utterly unscientific appears now as being much in line with present scientific formulations.

Adler's psychological system has received support from many sources. Many of Adler's findings have been "re-discovered," almost in a piecemeal fashion during the last two to three decades. Many of his concepts are becoming generally accepted. The teleological aspect of goals, the subjectivity of the individual, the social orientation of man, the significance of inferiority feelings, the totality of the individual personality, the autonomous self-determination of the individual, all constitute dynamics which have been recognized here and there. But relatively few investigators have yet discovered that all these partial phenomena are intrinsically interlinked. It was Adler's vision to recognize the basic foundation on which these various mechanisms and dynamics rest. He was the first one to provide not only a theory of the totality of

the individual, but to design techniques for investigating the unique total pattern of a person: his life style. This emphasis on the indivisible personality of each individual is expressed in the name which Adler gave to his psychological system. (2) However inadequate the term "Individual Psychology" may be, permitting many and easy misunderstandings, it reflects clearly Adler's basic assumption that the individual cannot be divided into parts; that he is more than the sum total of his parts, organs, dynamics, mechanisms, physical, or psychological functions.

It is this realization that the unit is free from determining influences—which is the basis of Adler's concept—that has been substantiated by scientific findings. The break with the traditional mechanistic-deterministic concepts occurs on this issue. Natural science came to this point by the observation of the smallest unit, the electron. Another step in the same direction was taken by the theory of Holism. When Smuts coined this term in 1926, he deliberately spelled it according to the Greek word "*holos*," which means wholeness, probably to emphasize that we are dealing here with a new concept which must be distinguished from the abundant empty talk about "wholeness" which has been discussed so often without being understood.

According to Smuts, (6) the theory of Holism makes the existence of "wholes" a fundamental feature of the world. It regards natural objects, both animate and inanimate, as wholes and not merely as assemblages of elements and parts. As wholes are more than the sum of their parts, the mechanical putting together of their parts will not produce them, nor account for their character or behavior. So-called parts are in fact not real, but largely abstract analytical distinctions, and do not properly or adequately express what has gone toward the making of the thing as a whole.

The scientific method has been based on the analysis of things into more or less constant elements or parts, the sum of whose actions accounts for the behavior of these things. In such a mechanistic scheme the material structures determine the functions of living bodies, and even mind is explained by physical mechanisms and functions. Life and mind are thus considered as derivative and epiphenomenal. Vitalism has opposed such mechanistic concepts; but the scientific scheme was more thoroughly undermined by the most recent discoveries in physical and mathematical science, which have resolved matter into variable energy, have destroyed the homogeneity of space and time and have, thereby, shaken the whole basis of fixed standards and accu-

rate measurements on which the mechanistic scheme is founded. The value of the mechanistic concept for research cannot be questioned, but it can no longer be considered as a true index of the concrete character of the universe and its contents.

Holism implies two great departures from the orthodox scientific scheme. First, matter, life, and mind do not consist of fixed, constant and unalterable elements. Second, the whole, which has hardly been recognized by science, appears as an active factor, more important than the parts or the elements. The whole is creative. Smuts gives a new explanation for this creativeness. When parts form a whole, something arises which is more than the parts, as the very nature and concept of a whole makes it more than the sum of its parts. In the moment the whole is formed we have an instant where "more" arises from "less," the higher from the lower. This does not violate reason. It is the making of wholes which makes the universe creative. In the course of the history of the earth, the forms of life have progressed from the simplest and lowest to the very highly organized types of today, culminating in the human personality. The creative view of evolution contrasts with the older mechanistic one, according to which evolution is mainly an unfolding of forms already existing latently in the old forms. In this old mechanistic theory the concept of creativeness has no place. New discoveries in geology, paleontology, and embryology seem to indicate that the old gives rise to genuinely new forms which cannot be reduced to the old and cannot be explained or accounted for by it alone. But we do not need the assumption of some mysterious irrational element, as the concept of the whole explains creativeness directly and simply.

The concept of Holism disrupts the usual conception of the relationship between cause and effect. The causal relationship presupposes an exact equation between cause and effect, which eliminates the possibility of creation or advance in natural happenings. If the effect can never be more than the cause, there is no room left for a creative progression. The accepted fact of creative evolution proves that the usual concept of cause is too abstractly and narrowly conceived; that in the universe effect can and sometimes does transcend cause, although usually on so small a scale as to create the illusion of their equality. The idea of wholes gives a clue and an explanation. So far as causes operate holistically, as where several factors contribute toward the making of new wholes, the process is creative; there is more in the effect than in the cause or the combination of causes, and real creative advance re-

sults. Purely mechanical causation, which is perhaps a mere fiction, is equative; but holistic causation, which is the real process, makes possible the increase and advance which is actually the fact in nature.

In this way the concept of the whole resolves the old controversy between freedom and determination in nature. The ordinary causal concept equates cause and effect without remainder, and thus makes the cause determine the effect completely. If this causal concept is wrong, the assumption of *necessity* becomes unjustified. So far as there is an undetermined creative element in the formation of wholes, not attributable to the conspiring causal elements, to that extent there is indetermination and freedom. It may be infinitesimally small and practically negligible in physical causation, because we are dealing here with mass phenomena; but it is much more marked and appreciable in organic happening, and still more so in mental processes. An element of freedom thus becomes recognized as inherent in nature, which increases with the progress of evolution, until on the human level it attains considerable dimension and becomes the basis for moral responsibility. In this way, freedom is recognized as a part of the universe and not merely as an attribute of the human will, as has been assumed for so long.

In line with Adler's concept of the individual, Smuts considers also the concept of wholes as being basic to the category of individuality. The organic unity which constitutes the whole is the ultimate basis of individuality. Traces of it exist already in inorganic nature, as in atoms and electrons; but it is only on the organic level that individuality assumes practical importance. They have distinct character and individuality. With the emergence of conscious mind in man, the aspect of individuality becomes all important, and becomes the basis for the latest and greatest whole of evolution, the human personality. Individuality rising into personality is perhaps the chief distinction of the human level of evolution. Individuality and reason are the principal constituents of personality; both are expressions of holism and have their roots in primitive holism. (We can accept the emphasis on reason as characteristic for human personality if we keep in mind that emotions, which seem often to contradict reason, can be considered just as logical, but that they express the "private logic" of a person. In this sense, Adler has restored to man the supreme reasoning power, which Freud with his assumption of unreasonable instincts had tried to negate.)

The creativeness of the whole explains the relation between matter



and life, between body and mind. It rules out both materialism and parallelism. It refutes psychological theories which viewed mental and psychological processes as products or aggregates mechanically formed out of small items of experience. There is no such atomicity about man. His action throughout is massive and holistic, in line with concepts developed in Gestalt Psychology.

It was no accident that Adler came to the development of his theories through the observation of the effects of organ inferiorities. (3) Here he saw that it is not the hereditary endowment or some innate weaknesses which "determine" the child's development. It is rather the child himself who, by his reaction to what he finds within himself and in his environment, determines their significance for him. The mechanistically oriented find it difficult to accept the child's creative ability in determining for himself his reactions; they look for factors which may have "forced" the child's decision, and therefore may be understood as the "causes" for the child's reaction. They have not found them, and never will. Because a child as a whole has the creative ability to incorporate what he wants to, and to reject as he sees fit. Nothing in him "forces" him either to withdraw or to over-compensate for any difficulty he may encounter, either within himself or outside of him. He is not shaped mechanically by hereditary and environmental influences; on the contrary, he integrates them according to his own perceptions and conclusions.

Once we have comprehended the essential freedom of the individual, his self-determination, we will not fall victim to the temptation to which many teleologically oriented scientists succumb, namely, to make the goals of a person the "determining causes" for his behavior. The individual sets up his own goals, and at the same time can change them. True enough, this freedom of choice is somewhat restricted once the individual has established his basic goals in life, his life style. This self-conceived frame of reference remains his personal bias which he cannot easily shed. But even within his own frame of reference he maintains a wide freedom of action.

We are dealing here with a crucial issue in medicine and psychiatry. While psychosomatic medicine is trying to evolve a total picture of the personality, most investigators can only give lip service to their own assumption of the totality of a person, because they are trained in a mechanistic-analytic approach and still consider the partial dynamics in their efforts to understand the total individual. They cannot conceive of the possibility that man is using all his inner resources, his

body, his mental and psychological potentialities, his thinking and feeling as *he* sees fit, in accordance with his own self-determined goals. The concept of man must remain inadequate as long as we have not shed the concept of a determining causality.

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