# Book Reviews

## Interpreting the Human Species

**The Difference of Man and the Difference It Makes.** MORTIMER J. ADLER. Holt, Rinehart and Winston, New York, 1967. xvi + 395 pp. $7.95. Based on the Encyclopaedia Britannica Lectures, Chicago, 1966.

**Robots, Men and Minds.** Psychology in the Modern World. LUDWIG VON BERTALANFFY. Braziller, New York, 1967. x + 150 pp. $5. Based on the Heinz Werner Inaugural Lectures, Clark University, 1966.

Mortimer Adler presents himself as director of an institute for philosophical research whose stated purpose is to discover and publicize the most fundamental views on leading issues in the world of ideas. This book aims to portray the present standing of the question of the nature of man, especially opinions about the proximity or remoteness of man from other animals. There are few questions wherein broad public understanding of scientific knowledge is more desirable. But this discussion is conducted in a highly arbitrary way whose effect is to obscure.

Adler opens his discussion by asserting that the scientific and philosophical aspects of the question of man's nature must be separated. It is the role of science to supply data whose relevance is to be appraised by philosophical standards. The philosophical precept meant to serve that purpose in this book is that of continuity. Where intermediate forms may be found between two entities being compared they are said to differ only as a matter of degree, but where there are no intermediates the difference is one of kind. No sooner is this distinction introduced than it begins to break down; differences in kind are subdivided into apparent and real, and the latter into superficial and radical differences. We are then told that an apparent difference of kind is owing to the accidental or contingent absence of intermediates whose introduction into the interval would show that the entities at opposite ends of the series "really differ in degree." Apart from the irremediable damage this blurring does to the author's initial distinction, it shows that all he means by difference in kind is discontinuous difference, and this is more a mathematical principle than a philosophical one. Wherein do Siamese twins differ, if the intestines of one show *situs inversus*? Is this a matter of kind or degree, or is it identity? Adler's concept of difference is so trivial as to be meaningless.

Adler discusses a number of attributes of man in terms of his distinction between difference in kind and degree, including phylogeny, but eventually makes his way to the question of man's difference from the computer. If a computer could be built and programmed to conduct discourse in conceptually based language, then man would differ only superficially from other animals, because his mental endowments result simply from the size advantage his brain has over theirs, and that is a matter of degree. Needless to say, man's difference from animals consists in more than the mere number of neurons. Nothing is said here of capacities for symbolic discourse or emotive expression or of any of a number of other attributes of the human mentality in addition to its employment of concepts and signs for them. Adler is everywhere looking for a linear portrayal of a human quality along which his distinction between continuous and discontinuous development can be applied. The process of abstraction that delivers linear variables such as brain size does not provide satisfactory representation of human phenomena or of our own knowledge of them.

The arbitrariness of Adler's treatment of human nature raises questions about his views of the readership to which interpretations of scientific knowledge are addressed. This book is based on a presupposition that its readers are familiar only with philosophic discourse and that their understanding will be broadened by the introduction of such scientific perspectives as phylogeny. I suspect that this is untrue. The educated layman is confronted with a profusion of scientifically oriented accounts of human nature, from Sherrington to Lorenz, Desmond Morris to Sir Alister Hardy and Arthur Koestler. I think it is fair to say that we have not seen a great popular classic on this subject since Ernst Haeckel's *Anthropogenie* (1874). It should not be too much to expect, in a culture which places a premium on communication, that there should exist an accomplished interpreter of the human species, its mental physiology, cultural accomplishments, faculties of symbolic expression, genetic makeup, adaptive potential, psychological endowments, and sociobiological situation. It will not do for a popular science of man to treat him as an automaton who differs from the animals or computers only in possessing more neurons in his brain. I find it crude and misleading to attribute to biological entities the circumscribed technological qualities of machines, which are human artifacts whose supposed operation in organisms betrays an anthropomorphic view of nature.

The interpretation of scientific knowledge entails a responsibility to comprehend a significant body of knowledge within some specified horizon and to render a straightforward account of that knowledge aimed at broadening the reader's understanding. It is surprising how little systematic attention has been given to this process, whether by museums, educational television broadcasters, or the publishers of popular science. We have no reliable index of public enlightenment, and the efforts of our principal institutions and organizations devoted to this objective are distorted by a host of conflicting presuppositions about what the layman "needs to know" and whether or not there exists an unsatisfied "demand" for knowledge of science on the part of the public. I do not know of a serious student of the sociology of knowledge who has devoted himself to this matter or even of an introductory historical survey of past efforts at popularization. There was scarcely a major figure in the natural or social sciences of the last century who did not devote major efforts toward public enlightenment, and most scientists with conspicuous interests in doing so today are of the prewar generation. What are the consequences of this trend for govern-

ment support of science and for the democratic process itself?

Ludwig von Bertalanffy bases his book on his Heinz Werner Lectures at Clark University in 1966. Here we find a biologist widely learned in the literature of controversy that has been generated by the moving frontiers between biology and psychology. And what he offers is an exercise in rhetoric on behalf of the organicist position in biology, especially its opposition to behaviorist psychology. He argues for "a new conception of man" based on man's faculties of symbolic expression, a program to which he finds the supple capabilities of general systems theory well adapted. The author expressly states that he offers an essay in the sociology of knowledge, in terms not of the diffusion of understanding in the population but of the social uses (and misuses) of science and technology. He identifies the stimulus-response model in psychology with the "robot model" of man, for which Arthur Koestler has coined the epithet the "ratomorphic view of man." He claims that reductionist psychology is to blame for manipulative use of the mass media and also assigns it the blame for a widespread breakdown in human values. There is great merit in his insistence upon man's symbol-creating powers as the basis for a new theory of mind, as Suzanne Langer has also recently argued in *Mind: An Essay on Human Feeling*. But it is rhetoric and no more to castigate behaviorist psychology as an instrument of mind control which must be set aside in favor of this more genial conception of man. Bertalanffy is one of the few writers of our time who could give an authoritative account of the failings of behaviorism while pointing out promising avenues for the future. That is of course not the task the polemicist sets himself. He is out to reassure his converts, not to enlarge their numbers.

Bertalanffy asserts that "hard science" (which he does not define other than to say it is conventional) cannot fathom the true nature of man, which will require an organismal approach. Again it is the aim of his rhetoric to belittle the physical sciences as lacking in the systems approach and thus being unequal to problems of emergent order in living systems (without a bow to the physics of fluids, crystallography, or stereochemistry). Bertalanffy has been an exponent of the biology of organized systems for 30 years, and he writes with pardonable pique that too many exponents of this approach in the present day speak of it as a recent invention. Cuvier's law of correlation was a systems concept, or one might cite T. H. Huxley's remark to the International Medical Congress in 1881 that "the body is a machine of the nature of an army, not that of a watch or of a hydraulic apparatus." The idea that organisms were "more" than the sum of their parts derives from German idealist philosophy of the last decade of the 18th century, and it exercised wide influence during the 19th century, in the cell theory and in experimental embryology. Bertalanffy takes legitimate delight in pointing out that we know the vocabulary of the genetic code but not its grammar, that general theories of history will have greater value than the specialties from whose exponents they elicit anxiety reactions, and that science may in time be humanized. He elicits a sympathetic response, for the direction of his argument is enlightened and liberal. But the periods of the university lecture hall are rarely suited to the requirements of the lay audience, and so it is with this volume. Those most likely to enjoy it are humanists concerned about the limitations of scientism, which is Bertalanffy's real target in this engaging polemic.

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## Behavior as a Continuous Process

**The Dynamics of Behavior Development.** An Epigenetic View. ZING-YANG KUO. Random House, New York, 1967. xiv + 240 pp. Paper, $2.45.

Zing-Yang Kuo is known to psychologists for his pioneering work on the development of behavior in the chick embryo. The importance of this work, conducted in the 1930's, is adequately reflected by the extent to which it is known today. The major contribution of Kuo's early work was not only in providing a technique for studying prenatal behavior in the chick but also in emphasizing the fact that behavioral development is a continuous process and that behavior at one stage of development can be an important determinant of behavior at later stages.

In *The Dynamics of Behavior Development* Kuo again emphasizes the importance of looking at behavioral development as a continuous process and expresses his feelings about some of the developments which have occurred in the behavioral sciences over the past 40 years. To the reviewer, many of the issues raised, such as the nature-nurture controversy, are ones which are no longer the major problems of the behavioral scientist. The criticisms leveled by Kuo frequently miss their mark. For example, Kuo's remarks on ethology apply to the early writings of the ethologists, especially Lorenz, and no attention is given to the more current ethological positions. Similarly, much of Kuo's book is a rehash of controversies that have been resolved or at least put aside in our current thinking about behavioral development.

This is not to say that all old issues are dead issues; but their revival serves little purpose unless something new is added. In my opinion Kuo's book adds very little, and the ideas proposed, if carried out to the extreme that Kuo would like, would result in the abolition of the science of behavior. Thus, to regard behavior as a continuous process from fertilization through death would seem to have its merits. But to accept the position that everything that occurs at a given point in time is equally important in influencing everything that is to occur in the future would necessitate exchanging hypotheses for chaos. As a specific example, in responding to criticism concerning the extent to which movements in the chick embryo influence later behavior, Kuo contends not only that prenatal movements influence later pecking but that such movements are the basis for all later behavior in the chick's repertoire. To adopt such a position is what the younger generation would call a copout. Everything influences everything, so no postulated relationship can possibly be wrong. In conjunction with this argument Kuo writes (pp. 100–101), "Moreover, I have not observed any single embryonic activity in the bird which is performed the same way twice." It would seem that this is an overzealous statement in support of his position or that Kuo has amazing powers of discrimination. If the statement is true, however, what are the ground rules for the classification of behavioral units on which the science of behavior can proceed? What good are the meth-