

Presidential Address

THE EPISTEMOLOGY OF "MENTAL" PHENOMENA

VIJOY K. VARMA¹

I consider it a great privilege and pleasure to address you this morning as the next President of the Indian Psychiatric Society. I am most grateful to the membership of the Society for having elected me to this highest position in the profession at the national level, and for having bestowed this high honour upon me. I feel humble when I think of all the great stalwarts who have earlier served as Presidents of the Society. Amongst this galaxy of luminaries are my senior colleagues, mentors and friends. Since 1969, when I joined the Indian Psychiatric Society, I have been considerably involved with the organization of the Society and have had occasions to know and work with many of its Presidents. We are all aware of the enormous tasks before us in the Society, from improvement of mental health services to better training programmes and research into the various aspects of psychiatry and mental health. I look forward to your help and cooperation in trying to advance in these areas in the year of my Presidency.

Many of you may have heard me in informal situations making a reference to professional brotherhood. The professional fraternity, of which I am a member, the fraternity of scientists and mental health professionals, is very important to me. The respect that you acquire from the professional brotherhood, "the Jury of the Peers" (and it includes Lady Peers also) is the ultimate arbiter of our professional

standing and of our very worth. Respect for the Jury of the Peers is of utmost importance to us.

INTRODUCTION

More than other medical scientists, a psychiatrist must have a holistic vision, must see the human being as a whole. Most often, the psychiatrist has to be a generalist as regards the human situation. It is accordingly only appropriate for the psychiatrist to understand the process by which we assume and acquire knowledge about the external reality and as regards the human body and mind.

Most scientists, including natural scientists, do not possess enough orientation to epistemology, as to how the knowledge that they deal with everyday is derived. Biological scientists possess even less information as biological sciences are considered to be less exact than physical and chemical sciences. In this regard, I may add that I have been fortunate in having the benefit of attending a series of thoroughly stimulating seminars on the philosophy of science at the University of Michigan over two decades ago presided over by Dr. Anatol Rapoport, a brilliant biological mathematician, whom I consider as one of my intelligent Gurus. It was on this occasion that I had the privilege of reading Hans Reichenbach's highly insightful book, "The Rise of Scientific Philosophy", along with a number of other books on concepts that materially

1. Professor of Psychiatry and Head, Department of Psychiatry, Postgraduate Institute of Medical Education and Research, Chandigarh 160 012

altered my earlier naive understanding of the scientific process. A few years ago I had the privilege of reading Robert Pirsig's "Zen and the Art of Motor Cycle Maintenance" which gave many insights and upset many existing notions, but more on this later.

Epistemology is defined as the philosophy of knowledge as to how knowledge is acquired by studying the objective world around us. As an interested layman, I possess a copy of Will Durant's classic "The Story of Philosophy". The very preface (to the second edition) of Durant's book deterred me as far as the whole area of epistemology is concerned. Calling it "that dismal science" Durant refuses to offer any apology for the neglect of epistemology in his volume and further adds: "Doubtless now that epistemology is dying in Germany, it will be exported to America, as a fit return for the gift of democracy" (Durant, 1952, pp. xii-xiii). In the same vein he adds: "Now began the great game of epistemology, which in Leibnitz, Locke, Berkeley, Hume and Kant waxed into a 'Three Hundred Years' War that at once stimulated and devastated modern philosophy" (p. 151).

It may be worthwhile here to examine the common sense approach to the perception of the scientific process. As a budding scientist I used to think that the famous laws of physics and chemistry like the laws of gravity and motion, Charles's Law and Boyle's Laws were absolute and that the question of their fallibility did not arise, as though they were made in heaven. It was subsequently and mostly as a result of the influence of Reichenbach's book that I came to understand that it was not so that these so-called laws have been derived through a long process and have a certain (but not absolute) probability of being true. Alongside, I came to appreciate the limitations of the scientific approach

and the empirical process.

There is no a-priori reason why we human beings should be aware of the nature of the external reality and of causality. In the universe it is only human beings who possess some such knowledge and are able to, albeit to a limited degree, understand the nature of the universe around them, including its objects and phenomena, and are able to predict certain phenomena and develop a theory about it. There is no a-priori reason for acquisition of this knowledge, and as Bertrand Russell points out "cosmically and causally, knowledge is an unimportant feature of the universe" (Russell, 1948 p. 9) and asks "...how comes it that human beings, whose contacts with the world are brief and personal and limited, are nevertheless able to know as much as they do know" (p. 5).

To start with let us give a brief definition for science and an outline of the scientific process. All of us have faced the problem of how to define science, ever since we started studying science. Many people define science as any systematic and methodical study and something that unravels the mysteries of nature. Science is an attempt to study natural phenomena, their nature and course, to classify them, to generalize about them, to predict about them, and thus to come up with a theory.

"Science represents man's most persistent effort to understand and organize knowledge by reasoned efforts that ultimately depend on evidence that can be consensually validated" (Odegard, 1986). Einstein once characterised science as "nothing more than a refinement of everyday thinking" (Einstein, 1950, p. 59).

The concept of reality

Before we come to the scientific process, a few words about the concept of

external reality and the concept and causality are important. There have been two major approaches to the external reality. The Cartesian view originated from the famous philosopher Descartes, who said that the external reality exists only insofar as it is in the mind of the observer (the famous **cognito ergo sum** dictum of Descartes). As opposed to the Cartesian view has been the solipsistic view which, in essence, says that there is an external reality out there, of which I may or may not be aware. Although my awareness may be limited, the external reality exists all the same. Empiricism sees the role of observations as important in understanding the external reality. Rationalism perceives reason itself as the source of knowledge.

The concept of causality

The concept of causality has been one of the key concepts in the philosophy of science. Are natural phenomena random happenings in the universe or do they follow certain laws? Is there order in nature? Immanuel Kant, the famous German philosopher, posited causality as one of the axioms, one of the synthetic a-prioris along with the other two of time and space. The concept of causality and of determinism simply says that there is order in the universe and events occurring therein follow certain laws and are pre-determined according to those. Aristotle classified four types of causes, namely material, efficient, formal and final. More recent, and what may be more applicable to the mental phenomena, is the distinction between causes and reasons, the former being mechanistic and the latter teleological and anthropomorphic.

THE SCIENTIFIC PROCESS

With this background, let us look at the classical method and process of science. As we have seen, science is re-

lated to the study of nature and properties of objects and phenomena. What we call scientific has a certain general property. We know of the external world by the impact it makes on our sensory system. The object or the phenomenon either registers on our sensory systems or produces certain other things or phenomena which register on our senses. Thus, although we do not see the force of gravity or an atom or even the molecular structure of a chemical or a substance, we do see changes or things attributable to these. How we know about gravity is well known. Molecular structure of chemicals is known through colour reactions or through X-ray crystallography. It is assumed that the impact on the sensory system would be pretty consistent and universal and would apply alike to all humans, thus giving rise to its consistency over time and replicability.

The classical scientific approach is called an inductivedeductive approach. We make certain observations in the universe, develop a hypothesis on the basis of that, make certain more observations to confirm or refute the hypothesis, reason out about the observations and draw certain deductions from it. Insofar as the deductions drawn can never be final, it raises further questions which require further induction to confirm or refute them. From hypotheses we move to theories and to laws of nature, each one increasingly more complex and at the same time more general and encompassing.

The English school which has been mostly responsible for delineating the above process is called the Empiricist school, and the underlying philosophy is called Empiricism. A number of major philosophers of science: Francis Bacon, John Locke and David Hume are foremost amongst its proponents. The scientific process, as we generally understand it, is empirical. The observations should be

reliable across time, the place and observations thus should be objective. There may be other approaches to the discovery of the universe around us but that is not called scientific if we apply the narrow definition of science as here. The empirical scientific approach is characterised by the reliance on the sensory modalities for understanding the object and phenomena around us.

Criticism of Inductivism

There have been three major criticisms of the inductive, empirical approach as outlined above.

Firstly, our sensory organs of perception are both limited and fallible. The sensory organs are very much limited as far as the phenomena in the universe are concerned. Our eyes see and ears hear only a very limited range of waves of electromagnetic frequencies. We do not hear anything if the wave frequency runs below or above a relatively narrow range (for example, we do not hear the dog whistle). At the same time, our sensory organs suffer from sensory illusions. It is clear that our perceptions are very much coloured not only by the field in which the sensory stimulants operate but also by our mental set or attitude. As Ackerman (1965) has summarised "the existence of illusion or conflicting reports from the senses, proves . . . that the senses cannot be trusted to provide knowledge in their sense" (p.16).

The second set of criticism to inductivism is that induction is not possible without hypotheses and axioms, assumptions and schemata. Russel (1948) also alluded to it in the following summation "Knowledge, in my opinion, is a much less precise concept than is generally thought, and has its roots more deeply *embedded in unregularized animal behaviour* than most philosophers have been willing to admit" (p.13, italics added).

"Empiricism pre-supposes that one can apprehend the real world independently of hypotheses and axioms" (Wallace, 1988a). Chalmers has pointed out, "... the inductivist is wrong on two counts . . . theory of some kind precedes all observation statements, and observation statements do not constitute a firm basis . . . because they are fallible" (Chalmers, 1976, p.30).

The next criticism of inductivism is on account of limitations in drawing inferences out of a limited number of observations. The scientist studies a particular sample and on the basis of his observations, he draws inferences about the total population. It is sobering to note that even David Hume, one of the founders of empiricism, contended that "even after the observation of the frequent or constant conjunction of objects. We have no reason to draw any inference concerning any object beyond those of which we have had an experience" (Hume, 1939, p.165). Karl Popper, perhaps the greatest philosopher of science, pointed out that no matter how large the number of hitherto supporting observations, this amount, when compared with the infinity of conceivable, future situations, approaches zero probability (Popper, 1965). "The history of science furnishes one refutation after another of supposedly iron-clad inductively derived truths" (Wallace, 1988a). As Chalmers (1976, p.33) has summarised : "The main reason why I think inductivism should be abandoned is that, compared with rival and more modern approaches it has increasingly failed to throw new and interesting light on the nature science". In the same way, Chalmers has reasoned : "the probability of the universal generalization being true is thus finite number divided by an infinite number, which remains zero however much the finite number of observation statements constituting the evidence

is increased" (Chalmers, 1976, p.17).

So, where we do go from here ? Does it mean that induction has no relevance ? In view of the limitations of the inductive approach, the concept of positivity came about. A posit is a statement with a defined, but not absolute, probability of being true. To give an example, let us look at the statement, "Man is mortal". It has been estimated that since the beginning of evolution about sixty five billion human beings have been born on this earth. Out of them, five billion are still living and the remaining sixty billion have died. Man is mortal cannot be definitely said regarding the five billion were still living and hence, "man is mortal" has a 12/13 chances of being true.

The other Approaches to Epistemology

We can perhaps briefly address to the other approaches that have been brought forward in view of the limitations of the inductive approach.

Falsificationism : This approach, which is generally associated with the name of Popper briefly states that the job of the scientist is to refute theories and that science advances by replacement of falsified theories by yet to be falsified ones (Popper, 1968 ; Wallace, 1988a). According to Popper, it is the job of a scientist to attack and to falsify a theory and that science advances only in this manner. The merit of a scientific theory is not in what it predicts will happen but what it predicts will not happen, how it limits certain things from happening. The more falsifiable a theory is and the more it constrains the phenomena, the better it is. The hypotheses which are not falsifiable are just not within the realm of scientific pursuits. The aim of science is to falsify theories and to replace them by better theories.

The objection to and limitation of falsificationism is roughly the same as in case of inductivism. One needs to proceed along the same empiricist and inductive approach to falsify a theory as much as to prove it and it accordingly suffers from the same limitations of empiricism that we have earlier discussed. Popper even considers somebody's approach to disprove a theory as a contribution to the development of that theory. One major problem in falsificationism is that, like inductivism, a part of the complex test situation involved in observation can be wrong and can result in erroneous prediction (Chalmers, 1976, p.61). "An embarrassing historical fact for falsificationists is that if their methodology had been strictly adhered to by scientists then those theories generally regarded as being among the best examples of scientific theories would never have been developed because they would have been rejected in their infancy" (Chalmers, 1976, p.63).

The paradigm approach: The paradigm approach is related to the name of Thomas S. Kuhn. Kuhn openly admits that no unbiased observation is possible and that observation depends on a paradigm. Kuhn (1970) came to realize that traditional accounts of science, whether inductivist or falsificationist, do not bear self-comparison with historical evidence. According to him, a mature science is governed by a single paradigm. A paradigm is a must for a science and it is this characteristic that distinguishes science from non-science. In the course of the development of a particular science, a time comes when the paradigm hitherto adhered to does not serve the purpose any more and it has to be discarded for a totally new way of looking at—a new paradigm. According to Kuhn (1970, 1977) science advances through the revolutionary overthrow of one scientific paradigm by another, and "... the communities' rejection of one-

time-honoured scientific theory in favour of another incompatible with it" (Kuhn, 1970, p.6). Paradigm is a sign of maturity in the development of any given scientific field.

Kuhn argues that no natural history can be interpreted in the absence of at least some implicit body of inter-twined theoretical and methodical belief. If that belief is not already implicit, it must be externally supplied by a current metaphysic, by another science, or by personal or historical accident (Kuhn, 1970, pp. 16-17).

In the course of development out of the various paradigms one emerges as clearly better than its competitors. It is that paradigm which is to be accepted. Kuhn quotes Francis Bacon (1669, p. 210) as having said "truth emerges more readily from error than from confusion".

Relativism-Subjectivism: In view of the problems in inductive approach, relativism-subjectivism accents the role of the investigator's preconceptions and subjectivity. The relativist-subjectivist makes no assumption of pure objectivity and asserts that one cannot comprehend the real world independently of hypotheses and axioms and a subjective bias may always be present. Popper (1979) spoke of evolutionarily determined "anticipatory theories" that are "genetically incorporated" into the sensory organs of all members of the animal kingdom. Psychologically and anthropologically, we know that even stark perceptions or sensations are governed by assumptions and schemata (Wallace, 1988a). Thus a subjective bias is present in all observations.

Anarchist Theory: This theory, which goes by the name of P. Feyerabend (1975) denies that there is something intrinsically special about science and that there is an objective scientific method. He considers the high status attributed to science in a modern society to be unjustified. To him, a scientific theory is like an ideology

or religious belief system : like works of art and aesthetic judgement or a matter of taste. Just like you cannot say that a particular painting is more true than the other or a particular religious system is closer to the ultimate reality or truth, the same way a scientific theory is not superior to any other. He even argues that the scientific theory enters "a complex discussion involving conflicting preferences and propaganda" (p.366) and that "what remains are aesthetic judgements, judgements of taste, metaphysical prejudices, religious desires, in short, what remains are our *subjective wishes*" (p. 285, Feyerabend's italics). He concludes that there is not a shade of argument that modern science is superior to magic or to Aristotelian science.

Intersectionalism: More recently, Edwin R. Wallace, IV, has brought forward an intersectional approach to science. According to him human behaviour is determined through an intersection between the antecedent state including the constitutionally and historically determined conscious and unconscious desires, fears, inhibitions, and mode of interpreting the world and the immediately precedent situation, that is the current environment (Wallace, 1986). The resulting behaviour may vary according to the modifications in each of the above. Even given the fixity of the antecedent state, the resulting behaviour may differ according to alterations in the immediately precedent situation. "Insofar as our behaviour is not externally compelled or constrained it is free ; as a function of our history and personality structure, it is determined" (Wallace, 1986). The human behaviour is determined by the "the sort of person I was and the sort of situation I faced". He makes a point that although human behaviour is determined, it is not predetermined and it does not carry fatalistic implications "nor does

determinism negate the importance of *conscious* efforts, attitudes, deliberations, and volition" (Wallace, 1986; Wallace's italics). He believes that autonomy, internal locus of control and capacity for self-transcendence are fully permissible in a deterministic universe and he sees the reduction of determinism as originating from its violation of "man's narcissistic presumption to rise above the causal nexus" (Wallace, 1986).

He further perceives the cause-effect relationship as a continuous process in time. "That reality is a *continuum* which cause and effect explanations arbitrarily segment into a series of temporally and specially frozen events" (Wallace, 1988b). As early as 1896, Freud invoked an intersectional concept of causality (Freud, 1896, p.217). In a way, it contrasts with one usual concept of causality as given by Mandelbaum's (1977, pp. 47-77) as "the end point of a process, of which the effect is viewed as its end point or result: the cause of this result is the process itself".

As Wallace (1987) summed up: "Psychoanalysis, like evolution and other grand theories of science, is assessed by data derived from various sources. It is the convergence or divergence of multiple lines of evidence that gives the verdict. We do not require certainty".

The Theories of Truth

One way of looking at science is that it is an approach to arrive at the true picture of nature. Science, thus, is an unending search for the truth. The truth or otherwise of any scientific theory or proposed law has to be established. There are four basic ways of looking at the concept of truth in the context of scientific pursuit.

1. Correspondence Theory: This theory is based on empirical criteria. Observations are used to establish whether a particular theory is true or not and the usual inductive-deductive process is used

to arrive at the truth of the theory. In brief, it can be said that "true propositions faithfully represent the structure of the reality to which they refer: 'a statement is true if it corresponds to the facts', as Popper (1962, p.376) tersely put it" (Wallace, 1988a). A statement is true if it corresponds to the facts. It is nearer to the truth (i.e. has more "truth content") than another statement if it corresponds to the facts more closely than the other statement (Popper, 1962, p. 376).

2. Coherence Theory: This is based on the logical criteria. A theory is true if the elements of it are related to each other by ties of logical implications.

3. Truth as Aesthetic and Pragmatic: This theory acknowledges that there is no absolute route to truth in scientific investigations. However, whether a theory is accepted or not depends upon the possible gains from it. Based to a certain degree on the Feyerabendian anarchist theory, a theory is true "as long as it is pretty and helps somebody" (Wallace, 1988).

4. Truth as the absolute, ultimate, undeniable reality: We do not have to prove the existence or otherwise of truth. Is there any ultimate nature and structure of the universe in which we live, and is there any theory and spirit guiding this reality? As children when we started studying science, we learnt that we must pursue and establish the truth as if truth depends upon our providing it. The Hindu concept is very clear in this matter that there is an absolute and undeniable truth and reality, whether we can see it or not.

EPISTEMOLOGY OF MENTAL PHENOMENA

When we try to look at the process of knowledge as far as the behavioural sciences are concerned, we immediately come face to face with the problem of the concept of mind. We can surmise of mind only through the behavioural activities

that we ascribe to the minds. For most of human history, it has been the heart and not the brain that has been considered to be the seat of the mind. We know of mind only through its behavioural correlates. "We know the mind, said Hume, only as we know matter : by perception, though it be in this case internal. Never do we perceive any such entity as the "mind" : we perceive merely separate ideas, memories, feelings, etc . ." (Durant, 1952, p.257).

Classically, in the modern times, cognition, conation and affect have been considered as the major constituents of the functions of mind. The term mental includes all of these and also a number of other functions, phenomena and manifestations which seem related to the mind but which do not easily seem implied in the above three-way classification. This may include such things as dreams, autochthonous thoughts, after images, revelations, faith, etc.

Mind-Matter & Mind-Body Problems

Any discussion of the epistemology of behavioural and mental phenomena immediately runs into the concept and definition of mind. The Western philosophy has been plagued for over 2,000 years with the dualistic theory of mind vs. matter. Is mind a part of matter or is it something separate ? "What we term 'mind' is an abstraction that refers to the organization of those properties which emerge from the interaction between two species of *matter*—the human body and its environment" (Wallace, 1985, p. 165).

The Indian philosophy has, by and large stayed out of the mind-matter controversy. Matter is only a product of our ignorance ; our inability to see Brahman. Matter has a certain quality and disposition (*Upadhi*) whereas the mind is *Upadhi*-less.

Truth is not debatable in the Indian

thought and it is only a construct based on our culture's construct. Truth, in the Indian belief, is transcendent and non-human.

The Indian philosophy has been basically monistic as far as the mind-matter relationship and the mind-body problem is concerned. It does not say that mind and matter are the same, but it does not appreciate the nature of the problem either and discards it as irrelevant.

One Indian approach has been the approach of the Sankhya philosophy which makes a distinction between *prakriti* and *purasha*. *Purasha* is the pure consciousness and reflects *buddhi* whereas *prakriti* is absolute, capable of cognition and not simply a product of *purasha*.

The Indian philosophy very well appreciates the qualities and properties of objects. In this way, it is antithetical to the Western characterisation of an object which is basically analytical and chemical. Indian philosophy recognises seven qualities of an object, namely, *Dravya*, *Guna*, *Karma*, *Samanya*, *Vishesh*, *Prabhav* and *Samvaya*.

Causality and Determinism in Psychology

"Medicine has long possessed a primitive concept of psychic causality—of the influence of ideas and emotions on health and disease" (Wallace, 1985, p. 132). Schopenhauer espoused a determinism in the psychological sphere identical to that in the physical (Wallace, 1985, p. 138). John Stuart Mill, who wrote extensively on many subjects and who is supposed to have been one of the most intelligent men who ever lived, attributed to the concept of determinism, "the existence of universal laws for the Formation of Character" (Mill, 1969, p.14). Tylor (1874, vol, I, p.2) who has been called the father of cultural anthropology maintains that "human thoughts, will, and actions accord

with laws as definite as those which govern the motion of waves, the combination of acids and bases and growth of plants and animals".

Although Freud's concept of determinism had its predecessors, "the explanation of Schopenhauer and Herbart, none of his precursors had a developed conception of unconscious motives" (Wallace, 1985, p. 141) and causal concepts were too mechanistic.

Freud has been criticised for his concept of psychic determinism. As we well know, psychic determinism and unconscious were the two basic concepts on which the entire theory of psycho-analysis was based. We now know that Freud did not discover either of these and that the concept of unconscious enjoyed considerable currency in Freud's days. With regard to determinism, what Freud did was to extrapolate the concept of determinism from the physical, natural sciences to the science of mind. In other words, if we accept that the physical events are not random happenings in the universe, but are caused by certain other events, there is no reason why mental phenomena are also not random happenings but are caused accidentally. Accordingly, Freud only extended the concept of determinism to the mental phenomena.

If we look at the concept of determinism even in the physical world, the concept of causality, and determinism was, to start with, taken from the mental world. The concept of causality was, to a considerable degree, an anthropomorphic concept. It was as if the metals and elements had a mind of their own and that their behaviour was purposive and teleological. The stone fell because it wanted to unite with the centre of the earth, plants grow upward to reach the source of light, elements attract each other or repel each other, etc. Such a "primitive notion of psychic causality was the first

conception of causality" (Wallace, 1985, p.117). The actions of one element upon others have been referred to as injustices.

Strong (1978, p.115) defines causation in psychology in the following terms: "A cause is an event that precedes the event of interest and that can be shown to have an invariant relationship to the event".

The concept of causality has given rise to so many problems that Bertrand Russel (1929) advocated its "complete extrusion from the philosophical vocabulary". Wittgenstein (1967) considered causation as superstitious and Reiner (1932, pp. 709-710) charged that causation is an anthropomorphic concept which "ceases to exist in physics".

Role of Introspection and Intuition

Introspection and intuition have always been considered as legitimate methods of knowing about the mind. In a way, we can say that from the sample of one (ourselves), we can generalize about the entire population of mankind. We may say that the sample of one is totally inadequate for the entire human race. Such a small sample would not be acceptable to a scientist. However, there is one aspect of this issue that is worth keeping in mind. In considering some other natural phenomenon, the phenomenon to be observed lies outside us. We do not have any direct method of learning about it and, hence, a large sample is required to rectify the error of observation. There is no fool-proof method by which we can learn about the event. However, in trying to understand the working of our own mind, this aspect of the error of observation is removed. As we are the observers and the observed at the same time, we can be sure that we know what is actually going on as far as the phenomenon to be observed is concerned.

Accordingly, introspection and intui-

tion have been well recognised as methods in human psychology. It was Fechner, during the second half of the 19th century, who, for the first time, suggested that there was no reason why psychological events also did not follow the laws of physics and chemistry. This was a major turning point in the history of psychology. Subsequently, although Freud added impetus to this scientific approach of the study of mind, in fact, he depended greatly on intuitive and introspective processes in developing a theory of psyche and personality. His study was also allegorical which is consistent with the accepted pattern then prevalent. In evaluating the contributions of Freud, we must keep in mind that in his time intuitive and introspective approaches were well acceptable as scientific methods in psychology and that although he elaborated greatly on the concepts of unconscious and psychic determinism (causality); he was by no means its founder. Russell (1948) calls absurd the view maintained by "a certain school of psychologists, who maintain that 'introspection' is not a valid scientific method" (p. 59) and he maintains that "Introspection is valid as a source of data, and is to a considerable extent amenable to scientific controls" (p.65). As Ackerman (1965) has pointed out, "just as there are objects which the senses experience, so there are objects which the mind experiences" (p.18).

The role of intuition in science has been far greater than is commonly believed. It is singularly important in developing hypotheses. "The formation of hypotheses is the most mysterious of all the categories of scientific method" (Pirsig, 1974, p. 106). Even Einstein has said: "Man tries to make for himself, in the fashion that suits him best, a simplified and intelligible picture of the world. . . in order to find in this way the peace and serenity . . . The supreme task . . . is to

arrive at those universal elementary laws from which the cosmos can be built up by pure deduction" (cited in Pirsig, 1974, p. 106). Is it that the scientific laws are more convenient than true? Regarding the role of intuition in the formulation of these laws, Einstein adds, "There is no logical path to these laws: only intuition, resting on sympathetic understanding of experience, can reach them . . . (cited in Pirsig, 1974, pp. 106-107).

We have to depend upon introspection for a number of psychological phenomena. The classical example given in this regard is that of after-image. If you look at a bright object for some time and then suddenly close your eyes, you "see" an outline of the object in complementary colour. There is no way how this experience can be objectively and empirically validated. The empirical approach requires that the phenomenon should be similarly perceived by outside, independent raters, thus giving it replicability and consistency. Similarly, phenomena like hallucinations (i.e. sensations in the absence of an external stimulus) and even pain can be perceived only at the individual, intuitive level. Does it make it any less real?

Another important problem in the study of the mental phenomena is that the very process of observation may influence the event. A simple example could be that if the people are aware that they are being observed, this knowledge itself may affect their behaviour. This problem has been encountered in many experiments in social psychology and the question is how to make the observation unobtrusively. A related and more serious problem is where the process of drawing one's observation towards it may result in the cessation of the phenomenon to be observed.

The classical example given here is the debate regarding the wave theory vs the corpuscular theory of light. The pro-

cess of observation is such that it will disturb the phenomenon so that an answer to this question cannot be found. It is one of the 'indeterminate' questions. Coming to the psychic events, a very ready example is that of dreams. If one were to focus conscious attention on dreams, the focus would bring about a cessation of the dream activity itself. There is reason to believe that the mental activities that occur in the process of falling asleep and the process of waking up from sleep may throw important light on the mental operations. Many people commonly experience fragmented or what has been called autochthonous thoughts or perceptions during the half-awake-half-asleep state. However, again, focussing attention to it will bring about a cessation of these phenomena. So, how must one study it ?

For mental operations to be empirically studied, it would require that the phenomenon is perceived and reported by the person. However, although a person may introspectively experience something, he may not always be able to experience it in words which would be essential for others to comprehend the phenomenon. Unless the above occurs, the empirical validity cannot be reached. What happens if the person is unable to express the experience in words ? There may be a number of mystical experiences which cannot be translated into words. Although the experiences which are common may have a vocabulary for their expression, the same cannot be said about unusual or idiosyncratic experiences. A colleague of mine is very fond of giving the following analogy : "How would a dumb person relate his experience on eating sweet ?" (Wig, personal communication).

INDIAN APPROACHES TO THE EPISTEMOLOGY OF MENTAL PHENOMENA

Although it is not the purpose of this

discourse to talk in detail about the Indian approaches to epistemology and this talk cannot do justice to the richness of Indian philosophical approaches to the above, perhaps certain points of departure from the Western approach can be taken note of. The following points may be considered in this respect :

(1) Mind-Matter duality

As opposed to much of the Western thought the mind-matter duality, which has plagued the Western thought for over 2000 years, does not exist in Indian philosophy. In a way, mind is also a part of matter and there is a continuous ongoing intercourse between the two. The observer is not separate from the observed. The two are engaged in continuous interaction. Since the Western thought maintains a duality between the observer and the observed, objectivity assumes great importance. In Indian philosophy, it is accepted that an observation cannot be fool proof. The purpose of the conjunction of the seer with the seen is for unfolding inherent powers of nature and spirit so that the seer discovers his own true nature.

As we have seen earlier, the Indian approach is monistic, *advaita*. It is true that the *samkhya* philosophy maintains a distinction between the *prakriti* and *purasha* and is a philosophy of pluralistic dualism; by and large, Indian philosophy remains monistic.

(2) Synthetic, holistic

In contrast to the Western analytical approach to recognition and theorizing, the Indian approach is synthetic and holistic. In the Western approach, if you are trying to understand something you must break it in two parts. You break something into two ; if you still do not understand, break it into halves again and keep on breaking it till you understand it.

This has resulted in the Western approach to identify the key attributes and active ingredients of substances and phenomena.

In Western science, the active ingredient in most situations has been identified in chemical rather than physical terms and thus does not pay adequate attention to the "state" of the thing. For example, iron is iron irrespective of its shape. H_2O represents water whether it is in the shape of water or ice or steam and whether water is stagnant in a pond or running water in a river. Alcohol is C_2H_5OH irrespective of the type of alcoholic beverage. Now a person who is savouring a rather rare scotch will be aghast if you say that he is drinking C_2H_5OH and thus something similar to the cheapest gin or arrack. The Indian concept of external reality has always been holistic and it is well documented in the ancient scriptures like Gita and Patanjali Yoga Sutra in which the shape and the state of the object have all been taken into account. The Western approach to identifying the essential ingredients also serves some purpose as it describes the object substantially but certainly not totally.

The Indian approach to science has also seen causality in the holistic fashion. As regards time, it is somewhat akin to Wallace's concept in that there is a continuous change of cause and effect. It also sees causality in a multifactorial way in which the entire system is interacting with each other to produce the effects.

(3) Illusory nature of perception

The Indian philosophy also is cognisant of the limitations of perceptions and the inferences to be drawn from it. The Srimad Bhagwat Gita attests to the illusory character of human perceptions, as does Patanjali Sutra. There is no fool-proof method of seeing the external reality. Identifying the seer with the

instrument of seeing, namely, the senses of perception and organs of action intelligence and ego is considered as *asmita* or egoism, and hence should be avoided.

(4) Non-normative approach to human behaviour

One of the definitions of health and illness is a statistical one, a normative approach. If you are like everybody else, you are all right. The usual is normal and healthy. Any deviation from the statistical approach is viewed with suspicion and is a *prima facie* evidence of abnormality.

However, the Indian approach to mind is aware of the differences across individuals and across time. It attests to a number of reasons for such variability, evoking concepts like *sanskara* and fatalism which may limit and prescribe what a particular individual may perceive.

However, it is clear that perceptions may vary not only across individuals but in the same individual from time to time. Many of the things that occur to us cannot be called usual by any means. Let us look at the creative process. We all know that scientists have flashes of creative insight. This does not occur everyday; in fact, it will not occur more than a few times in one's lifetime. This can, in no way, be called abnormal or pathological. Similarly, there are such things as religious revelations or *ilham*. So are other para-normal perceptions that can occur to some but not to all.

The Indian philosophy attests to the variability across individuals and the idiosyncratic nature of many mental phenomena. There is a greater awareness of such possibilities and of its awareness.

(5) From causes to consequences

Like me, others who began their careers in psychiatry in the environment of

the University of Michigan in the early 1960s were familiar with the famous aphorism of Ralph Gerard who directed the Schizophrenia Project in the 1950s : "Not a crooked thought without a crooked neuron." The converse of it, its corollary, is however not so well appreciated:

"Not a crooked neurone without a crooked thought". It is inconceivable that if you believe in the former, you can reject the latter. So, what do we have here ? We are actually moving from theory of causality to that of consequences. Every event in the universe, howsoever trivial, will have its consequences. It also applies to our thoughts, emotions, words and deeds over which we seem to have some control. If we engage in wrong-doing, we will have to face its consequences.

If we extend this concept, we will no doubt realize that we are talking about a *karma* theory. People generally think that many acts are finite and delimited as long as no one knows about it. You can cheat or steal or engage in a sexual escapade as long as no one knows about it. How would anyone know about it, after all ? We know, as a theoretical possibility, what Julius Caesar said 2000 years ago can be retrieved even now. The energy change has taken place ; it is up to us to retrieve this information. A simple analogy comes to mind. In India, even now when one makes a subscriber trunk dialing (STD) telephone call, it is counted as so many local calls, and there is no record who was the party called, what time the call was made and its duration. But, the telephone company can easily eavesdrop on it by hooking your telephone to a computer and come up with all the data ; something that is routinely done in many advanced countries. The point I am trying to make is that, it is theoretically possible to record every event in the universe. Simply because a thing is not re-

corded does not make it a non-event and does not subtract from its causal properties.

The above may be theoretically applicable also to events that are not possible to record or measure at present. What about the consequences of dallying in the titillating enjoyment of a pornographic book, or of having uttered an obscenity ! If we believe in causality and consequences, these will also have their impacts.

In a way, the *Karma* theory is related also to the *sanskara* theory and the free-will-determinism issues. Your *sanskara* is determined by your good deeds and misdeeds in the previous births and are passed on to you with re-birth. If the body is burnt, how can these be transmitted ? Again, we are running into the fallacy that we have been trying to avoid, namely that everything is important, whether you can measure it, record it or not. If you have committed mis-deeds earlier, you are born with tainted wisdom which will impair your ability to do good deeds. But it is a must to try your best to do good deeds, otherwise, you cannot rise from the morass.

The above is also related to the free will vs. determinism issue. We have seen how complicated the issue of determinism is, especially pertaining to mental acts. The Indian ethos, like virtually all religious belief systems in the world, is ambivalent on the issue. Determinism is related to fatalism, but you have freedom of choice as well. If you are born with bad *sanskara* and wisdom, your capacity for good deeds is limited, but still you must try your best to elevate your position through good deeds.

One important point regarding Indian, especially Hindu philosophy. We have seen the difference between the mechanistic, pushing causes and technological, anthropomorphic, pulling rea-

sons. Indian philosophy accepts the above, the purposefulness of the reasons. However, there is also the concept of *kaaran*. It will again have to be translated as "reason", but it is not the reason as we have discussed above. *Kaaran* is a cosmic causality how the event fits in God's scheme of things, God who is perceived as the cause of it all : *Sakal Jagat ke kaaramam*.

(6) Contemplative, participant approach

Finally, the Indian approach to science is basically contemplative, as opposed to the aggressive, manipulative Western approach. We try to understand nature, for its own sake and to adapt ourselves to it, rather than to meddle with it. We are not masters of the universe, but only participants. The aggressive, manipulative, exploitative approach to nature is already having a large number of repercussions. Furthermore, unfortunately, we do not know all the possible repercussions of our meddling with nature.

LIMITATIONS OF THE SCIENTIFIC APPROACH

As we have seen, each one of the various scientific approaches has its limitations. Popper admits the limitations and fallibility of the scientific approach and emphasizes it with a striking metaphor :

"The empirical basis of objective science has thus nothing "absolute" about it. Science does not rest upon solid bedrock. The bold structure of its theories rises, as it were, above a swamp. It is like a building erected on piles. The piles are driven down from above into the swamp, but not down to any natural or "given" base ; and if we stop driving the piles deeper, it is not because we have

reached firm ground. We simply stop when we are satisfied that the piles are firm enough to carry the structure, at least for the time being (Popper, 1968, p. 111).

Popper further writes "... if we expect truth we must search for it by persistently searching for our errors : by indefatigable rational criticism, and self-criticism" (Popper, 1968, p. 3) and further adds "... my answer to the question, "How do you know ? What is the source or the basis of your assertion ? What observations have led you to it ?" would be : "I do not know : my assertion was merely a guess. Never mind the source, or the sources, from which it may spring—there are many possible sources, and I may not be aware of half of them; and the origins or pedigrees have in any case little bearing on truth. But if you are interested in the problem which I tried to solve by my tentative assertion, you may help me by criticising it as severely as you can; and if you can design some experimental test which you think might refute my assertion, I shall gladly, and to the best of my powers, help you to refute it" (Popper, 1968, p. 27).

The modern approach to science depends greatly on measurement. Sampooran Singh (The Sunday Tribune, September 18, 1968) quotes R. D. Laing, a renowned psychiatrist, as lamenting the obsession of the scientist with "measurement and quantification" and physical science being concerned with a world of shadows and falling into the error of identifying appearance with reality. Sampooran Singh maintains that the concepts are not features of reality but constructs of the mind; part of the map, not of territory. Science seems to miss many important things, for example, the language of love and friendship and mutual understanding.

Einstein, Schrodenger and others have

referred to **another mode of knowing** that does not update by separating the subject and the object (Sampoorn Singh, 1938). Such a mode of knowing is of course well appreciated in the Indian scientific tradition.

Chalmers (1976, p.xiv) quotes an inscription of the social science research building at the University of Chicago as reading "If you cannot measure, your knowledge is mirage and unsatisfactory". Toulmin (1976) points out that Heraclitus argued that sensory observation always hold good for particular, specific times and places. All our resulting knowledge must, as a result, be correspondingly "contingent"—that is local, transcendatory and conditional in its scope and validity. Heraclitus accordingly formulated his much quoted epigram "everything is in flux" (p. 73).

In a way our difficulty can be summed up as per the following scheme :

"All of our knowledge of the world comes by way of the five senses.

So, all of our knowledge of the world is contingent;

So, we can make no necessary or permanent assertions about anything in the world—even about words and their meanings; So, language is "in flux"—from place to place and moment to moment—like everything else;

So, we cannot use language intelligibly.'

But the fact is :

"We do use language intelligibly;

So, language cannot be entirely "in flux". So, we can make some necessary or permanent assertions about the meanings of words;

So, not all of our knowledge of the world is contingent;

So, not all of our knowledge of the world comes by

way of the five senses alone." (Toul-

min, 1976, pp. 75-76).

In science, our insurmountable problem is really that of the need for certainty. We like to understand and predict about the universe around us as it gives a certain sense of security and control. But is there really an actual certainty? "Is This City of Truth a Reality, or is it a mirage"? (Toulmin, 1976, p. 48). As Wallace has rather pungently put it, "there is a bitch goddess or dog god against which we should declare. And her or his name is Certainty" (Wallace, 1988a).

Pirsig in his eminently readable and influential book, "Zen and the Art of Motor Cycle Maintenance", mounts a concerted attack on the entire area of scientific truth. He discovers, for example, that "the time spans of scientific truths are an inverse function of the intensity of scientific effort" (Pirsig, 1974, p. 108) and : "What shortens the life span of the existing truth is the volume of hypotheses offered to replace it;... as you try to move toward unchanging truth through the applications of scientific method, you actually do not move toward it at all. You move *away* from it ! ... it is science itself that is leaving mankind from single absolute truths to multiple, indeterminate, relative ones" (p. 109, italics in the original). It appears, thus that the scientific theories are not necessarily true, but are only convenient schemes of understanding the universe and its phenomena and thus reduce uncertainties, and the question of arriving at final and lasting truths does not even arise.

It is being recognized increasingly that although the inductive, empirical approach has well served acquisition of knowledge, it has important inherent limitations and is not the only approach possible to science.

"If all our knowledge comes from sensory data, what exactly is this substance which is supposed to give off the

sensory data itself?... If one accepts the premise that all our knowledge comes to us through our senses, Hume says, then one must logically conclude that both 'Nature' and 'Nature's Laws' are creations of our own imagination" (Pirsig, 1974, pp. 124-125). "It seems to me that the law of gravity has passed every test of non-existence there is. ... law of gravity exists **nowhere** except in people's heads! It's a ghost!" (Pirsig, 1974, p. 33, italics in the original). He further adds: "It is not uncommon, ... for Indian villagers to see ghosts. But they have a terrible time seeing the law of gravity." (p. 244).

However, undeniably science does something useful. The scientific theories, surely have resulted in our ability to predict about and manipulate nature to our benefit. There is no doubt that there is such a thing as electricity which has been harvested and which I am using just now in addressing you. In addition, as has been pointed by Chalmers, (1976, p. 108); "Scientific theories have an objective structure outside of the minds of individual scientists."

"Science exists in a particular society because it serves a specific function in that society" (Chalmers, 1976, p. 143). However, "The task for the 'science of mind' is not to **discredit** our experience of aesthetics, sensory, perception and the rest, rather, it is to bring to light the learning sequences and neural mechanism **called into play** in those activities" (Toulmin 1976, p. 277).

CONCLUSION

We have seen that much of our knowledge of the world around us, the external reality and nature comes through our sense organs. This ability to perceive the external reality is the basis of the empirical, inductivist approach. Induction is also involved in the other scientific

approaches, directly or indirectly, i.e., in falsificationism, paradigm approach and in intersectionalism. All these approaches have problems. "Can we avoid the scylla of simplistic dogmatism and the charybdis of epistemological anarchy?" (Wallace, 1988a).

However, we have seen that our sensory apparatus is both limited and fallible. We can perceive only certain things and phenomena and not others.

Pirsig (1974) raises a number of issues pertaining to the validity of the entire scientific process and scientific theories and truths.

Science faces, furthermore, the problem that it is totally incapable of studying certain important mental phenomena, at least "objectively", at the present time. How do you study or measure things such as the sense of joy that you experience at the mountain top or seashore? How do you study beauty, love and hatred, reverence and decision, faith and cynicism, patriotism, friendship, quality, excellence and dharma? The fact that we can not study them through the "scientific" method does not make these any the less important. As a matter of fact, we can even say the **things that most importantly concern us**, do not lend themselves to the scientific approach, science simply scratches the surface of the totality of the human situation. Science has been, and is useful, but it would be fatal to think that it has answers to all or even the most important issues, at least at present.

By the above, I am not trying to run science down. Science has been useful in many ways and we are reaping the convenience and comfort resulting from it. However, its impact so far has been only on the physical environment. It has made little impact on our mental state and almost none on the spiritual. It would be wise to maintain the right

perspective about the role of science in our everyday life.

There is no a-priori reason for us to have absolute knowledge of the universe in which we live. In the universe, only humans have some knowledge of it. Scientific theories subserve useful functions to reduce uncertainties and fear and to help desirable action. However, it would be wrong to think that we know, or will know everything regarding the operations of nature. It is possible for us to draw only some conclusions about the external reality—and most conclusions must remain tentative forever.

The scientific theories have ranged from subjectivism to empiricism, and from rationalism to anarchy to nihilism. The Indian thought is more cognisant of the limitations of knowledge. Indian philosophy is holistic, causality is not temporally linear, cause following effect. Furthermore, I would like to suggest that causality is multifactorial and interactive, based on the ongoing interaction between the various factors.

So, where do we go? It is not suggested by any means that we abandon science. Science is after all, in more general terms, our pursuit for knowledge. However, we need to assume a middle epistemological position. Induction is there, but we need take it with some reservations. We need to develop and maintain tolerance for ambiguities, uncertainties; even contradictions and opposites. We Indians, as it is, are less upset by these than the Western man with his analytical approach. The only possible position is for us to acknowledge our limitations. If that borders on intellectual nihilism, let it be so, for such are the ways of God.

ACKNOWLEDGEMENTS

I have already made a reference to the earlier influences on me which have contributed to this work. Two more

recent happenings need to be mentioned.

After I had selected the topic of the Presidential address early last year, I came across, in May 1988, the article of Dr Edwin R. Wallace IV, M. D. entitled, "What is truth? Some Philosophical Contributions to Psychiatric Issues" published in the February 1988 issue of the American Journal of Psychiatry. This led to my corresponding with him which blossomed into a full collaboration and friendship in which we exchanged views and Dr. Wallace made available to me several of his and other's publications, including the gift of a number of books. This has been most helpful in the preparation of this essay.

The other person whom I would like to recognize at this time is Professor Dharmendra Goel of the Department of Philosophy, Panjab University. On his invitation, I presented a paper, "Epistemology of behavioral sciences" at the National Seminar, "Is Epistemology Sociology of Knowledge?" held in Chandigarh, March 1-4, 1985. We have maintained our liaison and he was most helpful in discussing with and offering helpful comments and suggestions in the preparation of this paper.

Dr. Swaran Preet Singh, my Junior Resident, helped in editing the paper and Mr. K. Aravindakshan provided excellent secretarial help.

BIBLIOGRAPHY

- Ackerman, R. (1965) : Theories of knowledge : A Critical Introduction. Tata McGraw Hill Publishing Co. Bombay, New Delhi.
- Bacon, F. (1869) . Nervum Organum Vol VIII. In : Spedding J. Ellis RL and Heath DD : The Works of Francis Bacon, New York.
- Chalmers, A. F. (1976) : What is This Thing Called Science ? University of Queensland Press, Queensland.

- Delbruck, M. (1986) : *Mind from Matter ? An Essay on Evolutionary Epistemology*. Black Well Scientific Publication, Palo Alto.
- Durant, W. (1952) : *The Story of Philosophy*. Washington Square Press, New York.
- Einstein, A. (1950) : *Out of My Later Years*. Philosophical Library, New York.
- Engel, G. L. (1988) : How much longer must medicine's Science be bound by a 17th century world view? In: White KL (Ed) : *The Task of Medicine : Dialogue in Wickenburg* (In press). The Henry J Kaiser Family Foundation, California.
- Engelhardt, H. T. and Pellegrino, E. (1986) : Philosophy and medicine : A decade later. *Journal of Medical Philosophy*, 11, 1-117.
- Feyerabend, P. (1975) : *Against Method: Outline of an Anarchist Theory of Knowledge*. New Left Books, London.
- Freud, S. (1896) : Heredity and the Aetiology of the Neuroses. Standard Edition, Vol. 3, Hogarth Press, London, 1962.
- Hume, D. (1939) : *Treatise on Human Nature*, Dent, London.
- Kuhn, T. (1970) : *The Structure of Scientific Revolutions*, revised ed. University of Chicago Press, Chicago.
- Kuhn, T. (1977) : *The Essential Tension : Selected Studies on Scientific Tradition and Change*. University of Chicago Press, Chicago.
- Mandelbaum, M. (1977) : *The Anatomy of Historical Knowledge*. John Hopkins University Press, Baltimore.
- Mill, J. S. (1969) : *Ethology—the Science of the formation of character*. In: Nash, R. (Ed.) : *Ideas in History*, vol. 2. E.P. Dutton, New York.
- Odegaard, C.E. (1986) : *Dear Doctor. A Personal Letter to a Physician*. Henry J Kaiser Family Foundation, California.
- Pellegrino, E. D. and Thomasma, D.C. (1981) : *A Philosophical Basis for Medical Practice*. Oxford University Press, New York.
- Pirsig, R. M. (1974) : *Zen and the Art of Motorcycle Maintenance*. Corgi Books, London.
- Popper, K. (1962) : *The Open Society and Its Enemies*. Vol. 2. Princeton University Press, Princeton.
- Popper, K. (1965) : *The logic of Scientific Discovery*. Harper and Row, New York.
- Popper, K. (1968) : *Conjectures and Refutations : The Growth of Scientific Knowledge*. Harper and Row, New York.
- Popper, K. (1979) : *Objective Knowledge : An Evolutionary Approach*. Revised Ed. Clarendon Press, Oxford.
- Popper, K. and Eccles, J. (1981) : *The Self and Its Brain*. Springer International, New York.
- Reiner, M. (1932) : Causality and psychoanalysis. *Psychoanalytic Quarterly*, 1, 701-704.
- Russell, B. C. (1929) : *Mysticism and Logic*. Norton, New York.
- Russell, B. C. (1948) : *Human Knowledge*. George Allen and Unwin.
- Ryle, G. (1949) : *The Concept of Mind*. Barnes and Noble, New York.
- Singh, S. (1988) : *Survival Crisis : Cause and Cure*. The Sunday Tribune. Chandigarh, Sept. 18, 1988.
- Spillane R. (1987) : Rhetoric as remedy : Some philosophical antecedents of psychotherapeutic ethics. *British Journal of Medical Psychology*, 60, 217-224.
- Strong, S. (1978) : *Social Psychological approaches to psychotherapy research*. In: Garfield, S. and Bergin, A. (Eds) *Handbook of Psychotherapy and Behaviour Change*. 2nd Ed. Wiley, New York.

- Toulmin, S. (1976) : *Knowing and Acting : An Invitation to Philosophy*. Macmillan Publishing Co, New York.
- Tylor, E (1874) : *Primitive Culture*. 2 volumes, New York.
- Varma, V. K. (1985) : Epistemology of behavioural sciences. Paper presented at the national seminar on "Is Epistemology Sociology of Knowledge ?" Chandigarh, March 1-4, 1985.
- Varma, V. K. (1988) : The philosophy of Science : The Indian Perspective. Orator of the ICMR Dr Vidya Sagar Award, delivered at Srinagar, J & K, Sept. 30, 1988.
- Wallace, E. R. (1985) : *Historiography and Causation in Psychoanalysis*. The Analytic Press, USA.
- Wallace, E. R. (1986) : Determinism, possibility and ethics. *Journal of American Psychoanalytic Association*, 34, 933-974.
- Wallace, E. R. (1987) : Pitfalls of a one-sided vision of science : Adolf Grunbaum's foundation of psychoanalysis. In press, *Journal of American Analytic Association*.
- Wallace, E. R. (1988a) : What is "truth"? Some philosophical contributions to psychiatric issue. *American Journal of Psychiatry*, 145, 137-147.
- Wallace, E. R. (1988b) : Psychoanalytic causation revisited. *The Psychiatric Forum*, 14, 1-21.
- Wallace E. R. (1988c) : Mind-Body : Monistic dual aspect interactionism. *Journal of Nervous and Mental Diseases*, 176, 1-20.
- Wallace, E. R. : *Philosophy of Psychiatry .. General Issues*. In press for *Current Opinion in Psychiatry*.
- Wallace, E. R. : *Psychiatry : the healing amphibian*. Second opinion. (in press).
- Wittgenstein, L. (1967) : *Lectures and Conversations on Aesthetics, Psychology and Religious Belief* University of California Press, Berkley.