

MIND AND CONSCIOUSNESS IN MODERN SCIENCE

“ The mind is perhaps the deepest mystery, the most profound paradox of all existence. It may truly be that ‘ Darker than any Mystery ’, to use the words of Lao-Tzu ”,¹ observes Keith Floyd. The main difficulty in the study of mind lies in the fact that we have no direct access to the mind of our own or even to those of others. We infer facts about mind on the basis of behaviour of the animal. Reflexes, instincts etc. are accounted for by the explanation of ‘ random variables ’ which cause the differences of behaviour. Generally the nature of behaviour is associated with the nature of the nervous system but there is no linear relation between them. The capacity to modify behaviour in the face of new situations is known as ‘ intelligence ’.

The capacity to learn by experience varies considerably among animals. No animal is, however, altogether incapable of learning. The theory that mind has steadily evolved is not confirmed by observed facts. Sudden jumps have occurred and new elements appeared.

A planarian worm can learn to find its way through a simple maze. It appears to show anxiety, conflict, protest etc. during the training. There is evidence that even the amoeba shows symptoms of rudimentary mind, as it pursues animals of its own size and avoids dangers by moving away. Single-celled animals too, have been conditioned after hundreds of trials and it has been concluded that neither a brain nor a nervous system is necessary for such learning. Perhaps life and mind are associated in all forms of life, even in the simplest protozoa. The possibility is supported by the evidence in embryology because long before a brain develops, the development of the embryo follows an intelligent plan. F. L. Kunz says, “ — it is becoming clear that some form of consciousness accompanies all organic life, even the most primitive slime, and there is an accumulating body of evidence which points to its presence even below the threshold of life.”²

The materialist philosophy explained man’s thoughts as consisting of motions of little billiard balls in his head. But the transition from balls to thoughts is too abrupt. The theory of Emergent Evolution states that at various stages of material complexity radically new properties emerge. Accordingly both life

and mind are emergent properties of material aggregates but both have different properties from those of their constituents. This theory even though not illogical suffers from the defect that it cannot be proved. Thus it cannot be a working hypothesis; at best it may be regarded as a mere possibility.

There are insurmountable difficulties in passing from the physical to the chemical, from the chemical to the living and from the living to the mental phenomena. A completely unified science to cover all varieties of phenomena is on the basis of Goedel's incompleteness theorem impossible. "We shall never reach a set of concepts in terms of which all phenomena can be described,"³ observes Sullivan. If the molecule or atom which constitutes the life cell be endowed with additional properties to explain 'life' or 'mind', it will undergo a real change. Perhaps it may be necessary to include among the additional properties something like free-will or a rudimentary form of consciousness. This method maintains the principle of continuity which finds strong favour with scientists and yet introduces dualism in the properties of matter since consciousness is entirely different from the other fundamental properties.

Thus it is seen that there is no clear demarcation between the conscious and the non-conscious. Further, the connection between physical structure and mental characteristics is still hypothetical. The theory of biological evolution gives no clue to the development of the mind. Psychology also offers little help in the matter. Behaviourism gets rid of mind or consciousness by stressing that what we call mental processes are in fact bodily movements. We do not perceive nor we think, instead we just adjust our eyeballs or make incipient speech movements.

Yet one is directly aware of sensations, images, reasoning etc. within oneself and there is no reason to doubt that they happen in other people as well. According to behaviourism these sensations etc. are identical with bodily movements. Many authorities, including Dr. C. D. Broad, view this as impossible on the ground that if both were identical then it were reasonable to say that a molecular movement is also an awareness.

Skinner transformed behaviourism into a system of concepts and explanations which has become virtually the null-hypothesis

of modern psychology. A lot of laboratory work has been done under the Skinnerian Paradigm which tends to validate its assumptions. This is a proper paradigm in the sense originally stated by Thomas Kuhn, "for not only does it pretend to have the ability to generate explanations for all instances of human behaviour, but it also explicitly establishes the legitimate targets for scientific inquiry and sets the preferred methodological scheme for research."⁴ (J. W. Sutherland). The presumptions of the paradigm accord substantially with those of Darwinian biology and the positivist—empiricist preferences of modern science in general. Yet the system as a whole is largely hypothetical rather than axiomatic.

Modern science concerns itself almost exclusively with such phenomena as are empirical, reducible through surrogation to quantitative or precise qualitative terms and which can be handled within controlled laboratory environment. Under behaviourism humans must behave deterministically, a condition which quantum mechanics has already removed from its inanimate subjects. According to Sutherland, "the Central (and limiting) assumption of behaviourist psychology is this : given a sufficient knowledge of the genetic and environmental predicates associated with a particular individual, that individual's reactions to given stimuli may be predicted with essential accuracy."⁵ However, since the behaviourist theory is not able to deliver the deterministic models of behaviour despite its operant conditioning, the operational limits are reached long before the logical conclusion.

The study of human behaviour can best be made by considering it under three categories : the deductive, inductive and sense-driven modalities. The sense-driven behaviours give us the Freudian reflexive man (homo sentient). The inductive-driven give the Skinner's deterministic man, and the deductive-driven give the potentially autonomous man. Philosophers of science have found evidence to show that many of the greatest scientific "discoveries owe their origin not to the Baconist dictate that we let observed facts speak for themselves or the inductive engine which translates specifics into generalisations, but to largely deductive data and experience independent engines such as metaphysics, theosophism or neo-platonic devices."⁶

Like a computer system the brain functions towards the storage, transfer and operation of data and performs those tasks which can be reduced to the point where successive addition and subtraction or Boolean logic exhaust the process requirements. However, the human mind also tends to emphasize the manipulation of gestalten where as the computer must reduce each problem to the lowest order units like but-strings and 'ands', 'ors' etc. The basic building blocks of the memory in the brain tend to be complex gestalten, scene-like patterns. The nature of the gestalten, however, as also the nature of the process in which we manipulate them remains vague as yet.

Behaviourism has been able to draw attention to mechanical aspects of 'mental' activities. It reduced mental processes to conditioned reflexes. Pavlov's experiments about conditioned reflexes though conducted on dogs throw light on fundamental processes in other animals also, including human beings. He tried a variety of stimuli, noises, colours, touches, electric shocks etc. The results obtained by Pavlov were of particular interest since they were based on a sound scientific method. Later on experiments were carried out by others to show that conditioned reflexes can be established in children as in the case of Pavlov's dogs. According to Sullivan, "—it seems very rash to describe the mind as wholly built up of conditioned reflexes. Yet this is what some Behaviourists do. They regard the human mind as almost infinitely plastic, so that, by proper conditioning and environment, a baby can be turned into any kind of man."

Psycho-analysis assumes the existence of the 'unconscious' where mental processes actively go on of which we are quite unaware though they can be brought into consciousness by a voluntary effort or by special techniques of psychoanalysis etc.. Mental effects may leave traces in the brain which may give rise to memories. This sort of hypnotism was used by Freud in the investigation of the unconscious which is populated largely by painful memories and repressed wishes. They struggle to emerge into consciousness. Symptoms like dreams appear due to struggle of the memories or wishes against the repressing force. Freud laid great stress on repressed sexual desires and gave dreams a sexual significance. However, in view of the fact that there are too many variables in the interpretation of a dream, it is difficult to give or accept any

precise or convincing interpretation. Jung denied that the unconscious is a region populated by desires which have been repressed after conflict; it is according to him, a consequence of the individual's one-sided mental growth. Adler ignored the unconscious and the notion of repression. Likewise there were many break-aways from Freud, each giving a different form to psychoanalysis. As a science therefore psychoanalysis failed to take a satisfactory stand. So is the case with the Gestalt theory. "These concepts are too vague and indefinite to be called scientific,"⁸ says Sullivan. No theory or paradigm of itself can cover the range of phenomena properly falling under the purview of psychology. In fact there is as such, no generally acceptable system of psychological doctrines.

Mind and matter together are being studied at present employing the technique of biofeed-back using electronic gadgets to measure and amplify the minutest physiological changes. The study confirms that the mind with training, is capable of controlling the body. This fact was already known to Indian Yogis and meditators for thousands of years. It shows that in the 'alpha' state of consciousness or in the state of deep meditation the mind can 'will' changes in blood pressure, heartbeat, brainrhythms or even stop the activity of a single cell in the spinal cord. To study this phenomenon one needs precise information on what goes on in one's brain at the time it occurs. Biofeedback simply extends the normal ways of learning by measuring the minute changes in physical functions which remain hidden from consciousness, by displaying and evaluating the same to tell the learner or self-experimenter whether he is improving or not. Rewards are used, in the form of rapid signals such as a flash of light or beep, to shape behaviour as in B. F. Skinner's operant conditioning. According to the traditional view, the automatic nervous system is rather too stupid to learn by such a method.

Brain waves in the alpha range—eight to thirteen Hertz per second—represent the idling between the states of high mental activity and sleep—calm, alert, serene, relaxed, open to pleasant experiences. It is receptive and occurs spontaneously without violence. Those people who are introspective and intuitive produce a large quantity of alpha. It may be a language problem to give a satisfactory verbal description of the variety of experiences in the alpha state since there are only a few words in English for the varying states of mind whereas in Sanskrit there are perhaps twenty.

The field-of-mind theory views the body, mind and spirit as structural expressions of one basic energy. This theory is quite similar to Sri Aurobindo's concept which suggests that physical matter is the densest form of spirit, or spirit is the most rarefied form of matter. The idea of self regulation or voluntary control of involuntary physiological processes was developed in recent times by a German physician Johannes Schultz in 1910 and by biofeedback techniques in the 1960's. The yogis explain this by saying, "all of the body is in the mind, but not all of the mind is in the body". Accordingly the mind is a field—a real energy structure—of which the body, including the brain, is merely the densest segment. This is a concept similar to the field theory of science. "All physiological and parapsychological data are subsumed under one field-of-mind idea (name proposed by R. Alexander in *Creative Relation*). It encompasses the 'normal' physical, biological, and psychological facts of science, and also provides a matter-and-consciousness substrate for mystical, spiritual, and altered states of consciousness phenomena,"⁹ observe Greens.

The basic idea is that like a gravitational or electro-magnetic field, a field of mind surrounds a body. All such fields are in fact said to exist as subsidiary part of a general planetary field of mind, an energy domain having a multidimensional continuum of physical, mental and spiritual substance, as in Sri Aurobindo's matter-spirit concept. Each subsidiary field associates specific existential states, states of consciousness. Perception of these states comprises the basic data of all knowledge.

The human being is represented as a composite of many kinds of force, mostly at a level of unconsciousness. Man lives mostly unaware of his unconscious but his awareness can be extended into it by the methods of 'self-realisation', yogic practices etc. It is possible to conceptualise volition as the extension of energy from a higher existential level consciously into activities of a lower level i.e. from superconscious to conscious, to conscious/subconscious, or from transpersonal (which has four levels including intuitional) to personal (which is mental, emotional, etheric physical and dense physical in the descending order.) Each level serves as a metaforce source for the level immediately below and the sequence of volitional metaforces can coordinate the entire life pattern

viz. physical, emotional, mental, and transpersonal (moral) and can express 'purpose'. "Mind and matter require an energy link, and common substrate, if the Stanford demonstrations with Uri Geller and similar phenomenon observed in our laboratory with Swami Rama, are to 'fit' into a theory,"¹⁰ indicate Greens.

Parapsychology does not fit into an ordinary space-time theory; psychokinesis implies the existence of a many dimensional universe where volition directly handles energies. Biofeedback and parapsychological data together are stimulating the study of the mindbody problem and hopefully,¹¹ 'humans are close to a breakthrough in consciousness'. The ESP is not limited by the speed of light (hence beyond space-time), for consciousness has nowhere to go as it is everywhere. Precognition would seem natural once one recognises the absence of the concept of time in the unconscious since distance/duration are exclusive properties of the space-time frame. It is now being realised that it is not the brain which produces consciousness but on the contrary, consciousness creates the appearance of the brain and of the physical universe.

The Buddhists have been all along trying to tell us that the infinite unconscious, named Nirvāna, and the activity of the conscious mind, named Samsāra, are one and the same. When brainwaves slow down to perceptible flicker, one perceives clearly the off phase and the on phase—Nirvāna and Samsāra; each creates the other and is the same. In the ordinary consciousness or beta stage one fails to see that the environment is everything that is including oneself. Only in the 'high' moments different states of consciousness, from alpha to theta to delta, one sees through the screen of darkness, undergoes the successive experiences of slowness of time and motion to stillness; the conscious mind plunges into the infinite unconscious, out of time and beyond the relative world altogether (if time does not exist, space and matter become tenuous or imaginary concepts indeed), catches a glimpse into his self-Nature, erases his mistaken identity and feels one with the all-pervading (Tat Twam Asi = you are that, as the Vedas indicate).

Keith Floyd remarks, "It is encouraging to note that the idea of the Oneness and Allness of one and all, once thought the drink

of wild-eyed mystics, is fast becoming the meat of clear-eyed modern physicists."¹² Schroedinger, for instance, apart from pleading for new organising principles for biology which should go beyond the laws of physics and chemistry, discussed the following three questions regarding life and mind : (1) Where or how does mind act on matter ? (2) What determines the qualities of our sensations ? and (3) What events in sapce and time correspond to consciousness ?

Regarding the first question, Schroedinger says that there is no place in the nervous system or elsewhere in the body where mind acts on the matter. His assertion that ' mind per se cannot move a finger of a hand '¹³ does not agree with the findings of the recent biofeedback theory. He concludes that either mind *is* matter or by its very meaning it cannot act on matter. As regards the second question he said that no matter how far we go in scientific investigation, we see no way in which the stimuli of perception can have special action on the mind apart from the biological action. In view of the foregoing, the third question becomes acute. Schroedinger observed that consciousness is not associated with a kind of matter but with a kind of occurrence—specifically the occurrence of ' novelty ' in a biological system. He said, " consciousness is associated with the *learning* of the living substance; its *knowing how* (Koennen) is unconscious ".¹⁴ Consciousness began to appear in the course of evolution when the process of biological adaptation began. Greater the complexity of the novel situation to which an animal can adapt, the greater consciousness is ascribed to it. Consciousness is thinking new thoughts, the completely habitual has no correlation with consciousness at all.

William T. Scott feels that " The motive underlying all the diversity of Schroedinger's work is the search for an answer to the question of Plotinus : ' And we, who are we, anyway ? '¹⁵ This question has direct bearing on life, mind and consciousness. The theory of relativity had established that time is relative to the frame of reference. According to Boltzmann and Gibbs the direction of time might be derived from the behaviour of aggregates of particles following laws of chance. The arrow of time has no fixed, absolute direction. Schroedinger attributed greater absoluteness to mind as he said, " ———physical theory in its present stage strongly suggests the indestructibility of Mind by Time."¹⁶

The world is held in common, is a common constituent (not object) of perception; it is located *in* the mind, on which the action of the world is carried out. The world and the mind * consist of the same bucks, as it were, only arranged in a different order—sense perceptions, memory, imagination, thought.¹⁷ But focussing attention on both simultaneously is really difficult. If consciousness is the most fundamental entity, then one can say that all life, mind matter are made up of overlapping parts of consciousness.

New Delhi.

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NOTES

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3. J. W. N. Sullivan—The Limitations of Science, p. 105.
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5. *Ibid*, p. 33.
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11. *Ibid*, p. 24.
12. Keith Floyd—*ibid*, p. 55.
13. Erwin Schroedinger—What is Life ? p. 215.
14. Erwin Schroedinger—Mind and Matter, p. 9.
15. W. T. Scott—Erwin Schroedinger, p. 105.
16. Erwin Schroedinger—Mind and Matter, p. 87.
17. Erwin Schroedinger—Nature and Greeks, pp. 91–92.

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