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Nature of Reality: Physical, Metaphysical and Mystical Aspects

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Abstract

Nature of Reality has been subject of investigations since historical times both in science and religion. The physical interpretation of Reality has experienced a dynamic change from Aristotle to Einstein. Relativity theory and Quantum mechanics have led to formulations of new concepts regarding space, time, matter and reality. Uncertainty Principle by Heisenberg and the concept of dual nature of matter and radiation by Louis de Broglie gave a serious blow to the philosophy of determinism based on Newtonian Mechanics and Cartesian world view. The great debates between Einstein and Bohr at Solvay Conferences about the inadequacy of quantum mechanics to describe physical aspect of Reality are a part of history of science now. EPR paradox and Bell's theorem have introduced the idea of connectedness and consciousness in Quantum Reality. Experience is the ultimate test of truth or Reality for the Indian philosopher. The Reality is trans-empirical, hence, it cannot be known through sense experience in the way in which empirical/scientific knowledge is gained. Reality is better understood or comprehended through intuitive experience for it transcends both the rational and the sensory aspects of human experience.

Keywords: *Reality, Newtonian World view, Copenhagen Interpretation, Uncertainty Principle, EPR Paradox, Metaphysics, Mysticism*

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INTRODUCTION

Nature of Reality deals with investigations which fall under three different domains of knowledge pertaining to Physical Sciences, Metaphysics or Philosophy, and Mysticism. The queries to be addressed are: What is real? What is the universe made of? How does it work? What is the origin of life in this universe? Who created this universe? Physicists and philosophers have been asking these questions since the dawn of civilization. Greek Philosophers, including Socrates, Aristotle and Plato, are known as founders of modern philosophy.

The concept of Reality has undergone a revolutionary change ever since the time of these celebrated Greeks. The study of planetary motion established that there is perfect order in the Universe. The philosophical quest for the ultimate Reality, using reason and speculation, transcended the boundaries of physical Reality. Recent developments in physics have revolutionised the physicist's conception of Reality. Today many scientists explore the 'metaphysics' of physics with their powerful instruments. The new insights of the modern physics into the mystery of the universe have prepared the stage for a dialogue between science and philosophy.

PHYSICAL ASPECTS OF REALITY

Classical Notions about Reality

Aristotle is known as founder of Physics; he wrote the first book of Physics and introduced many metaphysical principles in physics. Everything had a natural place and every object had its own nature in his world view. Aristotle made a sharp distinction between celestial and terrestrial world, the latter being imperfect, corruptible, and prone to constant change; while the former perfect, incorruptible and immutable. Aristotle's philosophy of nature was comprehensive and highly appealing to the common place wisdom of the day. It gave birth to monotheistic conceptions of God and a dualistic vision of Reality. The germs of an anthropocentric worldview were inherent in Aristotle's philosophy of science.

Newtonian mechanics gave birth to a mechanical philosophy of nature. It claimed that everything could be explained in terms of laws of motion and the interaction between the material particles. This meant that all things could be explained in terms of just four fundamental concepts: space, time, mass and force. A mechanistic worldview or the clockwork universe was the immediate consequence of Newtonian physics. The divine hand, having set it right in the beginning, left it undisturbed. There was not a scope for divine intervention, chance and indeterminacy in a deterministic worldview. Reality can be known by using mathematical tools and all events become predictable in future.

In the beginning of 20th century, the advent of special theory of relativity dealt a death blow to mechanical philosophy of nature. Newtonian mechanics held space, time and mass to be absolute, but relativity theory showed them to be relative. Quantum mechanics introduced the concept of indeterminacy and chance in physical measurements. It gave a serious jolt to the mechanical philosophy of nature [1].

Scientists of Vienna circle, better known as Logical Positivists, believed that knowledge of Reality should be based on sense experience. All valid statements must have an empirical basis, otherwise they are meaningless. Logical positivists were antagonist to the use of metaphysics in science. However, mechanical philosophy of nature seems to be an internally inconsistent, experientially unrealistic and philosophically unreflective approach to Reality. Einstein [2] had a dig at mathematical approach to Reality: 'As far as the laws of mathematics refer to Reality, they are not certain, as far as they are certain they do not refer to Reality'.

Einstein realized a new vision of the universe. His theory of relativity has altered the long-held scientific assumptions of Newtonian mechanics and changed radically the way we look at the world. Relativity shows that our knowledge of Reality is not limited by sense perception only, but brings home to us that Reality is often much deeper than what can be perceived by our senses. Materialism which refuses to go beyond what is observable by the senses has been shown to be an inadequate philosophy of nature.

Quantum Nature of Reality

The Copenhagen interpretation [3] of quantum mechanics was the first and the most prevalent response to the quantum Reality question. Neils Bohr and Werner Heisenberg were the founding fathers of Copenhagen interpretation which was not acceptable to Einstein, the father of Relativity theory. The key idea in the Copenhagen denial of deep Reality was that the quantum entities did not have dynamic attributes of their own; it was only in the act of measurement that they received dynamic attributes. Principles of Uncertainty and Complementarity were the corner stones of Copenhagen interpretation, proposed by Heisenberg and Bohr, respectively.

The discovery of Uncertainty Principle is the most significant development in the history of science. It puts a natural limit to the precision attainable in the quantum world. It must be noted that this limitation is imposed not by practical difficulties of measurement but by theoretical considerations, by the very nature of Reality itself. There will always be a finite inaccuracy and uncertainty; this is a law of nature. Since precise knowledge of the present state of affairs of a phenomenon is not possible, precise prediction of its behaviour also becomes impossible. Hence the quantum world and its Reality are indeterminate.

Principle of Complementarity highlights the linkage between different aspects of Reality. For instance, the particle nature and wave nature of light are mutually exclusive in the sense that the presence of one excludes that of the other. Thus this principle argues that even items which appear incompatible are united at a deeper level. What appear opposites need not be contradictory, but may be two poles of the same deeper reality. The principles of Complementarity and Uncertainty show the unbreakable link between the act of observation and our picture of Reality. Bohr sums up his outlook on quantum Reality [4]. 'There is no quantum world. There is only an abstract quantum physical description. The task of physics is not to find out how nature is; Physics concerns what we can say about

nature'. In the Copenhagen interpretation, there is no Reality in the absence of observation, or in the other words, observation creates Reality. The conceptual weakness of the Copenhagen interpretation is that it regards both the measuring device and the measurement act as ultimately unanalysable.

Consciousness and Quantum Reality

David Bohm [5] explains the limitation of Copenhagen interpretation by introduction of a new concept: the implicate order. The implicate order is a process of enfoldment and unfoldment in a multi-dimensional space. The entire universe with all its fields and particles is unfoldment of this implicates order. It implies an organic vision of the universe unlike the classical emphasis on fragmentation.

Another important aspect of the quantum revolution is that it highlights the role of consciousness in creating Reality. According to Eugene Wigner [6], 'It is not possible to formulate the laws of quantum mechanics in a fully consistent way without reference to the consciousness. It will remain remarkable that the very study of the external world led to the conclusion that the content of the consciousness is an ultimate Reality'.

John Stewart Bell [7] developed a model of Reality known as Bell's theorem: Reality must be non-local, which means that at a fundamental level, the different isolated objects of our experience are connected in an intimate and immediate way. Where quantum physics revealed the inadequacy of our common sense ideas to deal with the microscopic world, Bell's theorem showed the inadequacy of the same to deal with the macroscopic phenomena.

EPR (Einstein, Podolsky and Rosen) Paradox aims to show that quantum theory was incomplete since it fails to give a full description of nature. The key idea of EPR is the assumption of locality or the principle of local causes. According to this principle, what happens in one place is in no way dependent on an experimenter or an event at another place, where the distance between the two places are 'space-like' separated. EPR effect seems to indicate a super – luminal (faster than light) communication [8].

Bell's theorem resolves the contradictions of EPR Paradox. Bell stated that either the statistical predictions of quantum mechanics or the principle of local causes must be wrong. Experimental proof of Bell's theorem established that assumption of locality collapses while statistical assumptions on which Bell based his theorem are correct. To show that the principle of locality is false, it should be shown that what happens in one area is dependent on the changes that an experimenter makes in a distant space - like separated area. Thus in Bell's theorem, non-locality imposes itself as a fundamental Reality against our common sense idea of the world as consisting of different parts.

Einstein believed that quantum theory was incomplete and hence inadequate to describe the nature of Reality. As a whole, there seems to be contradictions, logical paradoxes and speculative jumps inherent in quantum theory in explaining the physical Reality. Bell [9] and some of his supporters share the view that the quantum mechanical description of natural phenomena will be superseded in future. Each model of Reality of the physicists is thus also indicative of the unexplored regions of Reality. Concept of Reality has undergone a sea change since the times of Aristotle. Let us probe the metaphysical and mystical roots of Reality and explore the possibilities of a dialogue between Science and Religion.

METAPHYSICAL NATURE OF REALITY

Metaphysics is a systematic and sustained inquiry into the nature of ultimate reality. It is an attempt to know the reality as against mere appearance. Metaphysics is the bridge between science and religion. Religion relies both on reason and revelation in its attempt to study the nature of Reality. In the *Mandukya Upanishad*, the method of inquiry into the states of experiencing, waking, dreaming and deep sleep is frequently adopted.

To the Indian philosopher, experience is the ultimate test of truth [10]. Since the reality is trans-empirical, it cannot be known through

sense experience in the way in which empirical objects are known. It is known through intuitive experience *(anubhuti),* it is the experience of the highest level, for it transcends both the rational and the sensory aspects of human experience with which we are normally acquainted.

Since the ultimate reality is trans-empirical, the Hindu philosophers rely on scripture *(sruti)* for obtaining the knowledge of the real. Discursive reasoning functions at the relational level. Since the ultimate reality is distinction-less, reason is not competent to comprehend it. So the proper ground of rational knowledge is immediate experience, which differs from experimentation in science.

The truth, which the scripture speaks about, is the direct outcome of the intuitive or mystic experience of the ancient seers. It contains what is borne out by their direct and authentic experience. Though the scripture is authoritative, the knowledge which one derives from it is only mediate. The knowledge, which is revealed by the scripture, must become a matter of experience; only then revelation would have fulfilled its mission. A man who has realised the integral experience, there is no need for him to depend on any external authority in the form of a scripture. His wisdom is self-certifying or self - revealed.

According to *Upanishads*, *Brahman or Atman*, which is the ultimate Reality, is of the nature of existence *(sat)*, consciousness *(cit)*, and bliss *(ananda).* It is one only and non-dual. The pluralistic universe is only an illusory appearance of *Brahman* or *Atman* due to *Maya* or *avidya* (ignorance). There are two views of reality in the *Upanishads*, the cosmic view and the acosmic view. These two views serve as the bases for the theistic and absolutistic schools of Vedanta. Hindu Philosophy of Vedanta considers this word as *Maya* (illusion) and lays stress on Reality beyond appearance in phenomenal world.

MYSTICAL ASPECTS OF REALITY

In contrast to scientific knowledge, mysticism is concerned with a direct experience of Reality. It is by transcending intellectual knowledge and sensory perception that we come to the 'absolute knowledge' of the Reality. According to Fritzof Capra [11], 'The knowledge of Reality in mysticism is the direct experience of undifferentiated, undivided, indeterminate 'suchness'. In mysticism knowledge of the ultimate Reality cannot be attained through reasoning because it transcends our conventional modes of language'.

The process of scientific research tells us that an experimental enquiry into the nature of Reality cannot discard either reason or intuition. Since both these abilities are integrated in the one human being, a mutual complementarity of the two is essential. The significance of intuition and reason is quite evident in our life and they must complement each other in our search of Reality. There cannot exist a rebellion between truth and truth. The pragmatism of the Copenhagen interpretation of quantum theory indirectly affirms the desperate quest for integration. As Gary Zukov [12] puts it: 'The rational part of our psyche, typified by science, began to merge again with that other part of us which we had ignored since the 1700's, our irrational side'.

Modern science has come up with the most exciting discovery of the interconnectedness of the universe. The vastness of the Universe poses no threat to its interconnectedness. This phenomenon is found both at the local and cosmic levels, both in the ontological and epistemological levels.

This progressive trend towards greater unification enabled science to transcend the apparent contradictions of several pairs of opposites e.g., force and matter, particles and waves, motion and rest, existence and non-existence. The scientific research has established interconnectedness of all material beings tracing their common origin to quarks and leptons. The Human Genome Project has proved the unity in diversity of the living world.

Capra [13] has established parallels between the principal theories of modern physics and the mystical traditions of the East, viz., Hinduism, Buddhism and Taoism. For example, we have no direct sensory experience

of the four-dimensional space-time continuum, and whenever this 'relativistic' reality manifests itself we find it very hard to deal with it at the level of intuition and ordinary language. A similar situation exists in Eastern mysticism. The mystics seem to be able to attain non-ordinary states of consciousness in which they transcend the three-dimensional world of everyday life to experience a multi-dimensional reality, which is impossible to describe in ordinary language.

Opposed to the mechanistic conception of the world is the view of the Eastern mystics [14] which may be characterized by the word 'organic', as it regards all phenomena in the universe as integral parts of an inseparable harmonious whole. For the Eastern mystic, all things and events perceived by the senses are interrelated, connected, and are but different aspects or manifestations of the same ultimate Reality. Our tendency to divide the world we perceive into individual and separate 'things' and to experience ourselves in this world as isolated egos is seen as an 'illusion' which comes from our measuring and categorizing mentality.

The division of nature into separate objects is, of course, useful and necessary to cope with everyday environment, but it is not a fundamental feature of Reality. For the Eastern mystic, any such objects have, therefore, a fluid and ever-changing character.

The Eastern worldview is thus intrinsically dynamic, and contains time and change as essential features. The cosmos is seen as one inseparable Reality -forever in motion, alive, organic - spiritual and material at the same time.

Mysticism is the art of union with Reality [15]. A mystical state has the quality of ineffability. It thus resembles a state of feeling rather than a state of intellect. The mystic experience is imbued with a noetic quality, a quality of transience and of timelessness. There are many stages of evolution in the life of a mystic. Ultimately, the mystic attains the perfect union with God and he cries: 'I am God - *aham brahm asmi'*. It is a well-known fact that mystics feel that exalted state of ecstasy but fail to describe it in ordinary language. The mystics use the simile of a dumb person who cannot describe the taste of candy [16]. Saith Kabir: *'Such state is like the dumb tasting of sugar, which in no way can be described'*.

Mystics believe in the integral or holistic experience of Reality. We need not rest content with the partial truths revealed by astronomy, by physics, by biology, by history; each true in its own field, none complete in itself, none giving the whole picture; nor yet with the truth of mathematics or the truth of language, primarily truths of expression, obeying rules which men themselves have made. Beyond all these, beyond the contradictions of each separate truth, lies concealed the supreme and final truth.

The realm of mystic experience is a Reality beyond the comprehension of our senses. But there is clear evidence in Sri Guru Granth Sahib (SGGS) [17] regarding the transcendental nature of this phenomenon:

'In this realm, one sees but without the eyes; one listens but without the ears;
One walks but without the feet; one works but without the hands;
One speaks but without the tongue; thus attaining life in death.
O Nanak, one meets the God after realisation of the divine law'.

Note: SGGS denotes Sri Guru Granth Sahib, the Holy Book of Sikh Religion. Publishers: Shiromani Gurdwara Parbandhak Committee (SGPC), Golden Temple Press, Amritsar. M = Mahla i.e., succession number of the Sikh Gurus to the House of Guru Nanak, P refers to Page number of the SGGS.

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