Review Article

On the Concept of Spacetime & Consciousness: Some Western and Indic Thoughts

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Abstract

What is 'the nature of reality'? This thought has occupied the minds of scientists and philosophers since time immemorial. This issue is examined scientifically, that, how the views of scientists and western philosophers have undergone a dramatic change over a period of time. This may then answer whether spacetime is a reality of nature or if it is just a figment of our imagination in which to view this cosmos! The article begins with the thoughts of Democritus, and the other Greek philosophers, continuing with the ideas of Copernicus, Galileo and Kepler. With the thoughts of Bacon, Descartes and Isaac Newton, the rise of the 'mechanical world view' later the decline of this view is discussed when the phenomenon in optics, electricity and magnetism could not be explained. Then the concept of 'field' was evolved, culminating in 'Maxwell's equations of electromagnetic fields'.

The beginning of twentieth century saw the evolution of the concepts of 'relativity', by Einstein, and the birth of 'quantum theory', starting with the idea of 'quanta', originated by Planck in 1900. The first three decades of the 20th century saw great breakthroughs in the world of theoretical physics - totally new ideas on 'the nature of reality' were being conceived. Large numbers of fundamental particles were discovered in the ensuing years. However, not much progress indeed was made in answering some of the most fundamental questions about the existence of human life and the nature of reality. Some interesting ideas on 'biocentrism' have now evolved. Biocentrism, along with the ideas of quantum theory and the concept of consciousness, may answer some of the intricate questions about the nature of reality; these will be discussed at length. These concepts will then be viewed from the perspective of Indic thoughts. The 'Vedic' and 'Upanishadic' knowledge from Indian scriptures may probably answer even more clearly some of the most intriguing questions about the existence of life and the 'nature of reality' itself.

Keyword: Concept, consciousness, spacetime, Western thought, Indic thought.

1. The Beginning of Scientific Thought

Let us initiate our thought process from the time of Democritus (460-370 BCE), a Greek thinker of pre-Socratic philosophy. Democritus is sometimes considered 'the father of modern science'. He is probably the first thinker in the history of western scientific thought who postulated 'the

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theory of atom-ism'. He said, 'Nothing exists except atoms and empty space; everything else is an opinion.' He also said, 'Happiness resides not in possessions, and not in gold, happiness dwells in the Soul'. Democritus thus had established 'the atomic theory of the universe'. Aristotle (384-322 BCE), another Greek thinker and a natural scientist as well as a disciple of Socrates and Plato, was highly influenced by the thoughts of Democritus. The study of natural sciences was dominated by Aristotle until early modern times, and modern physics was developed in reaction to the Aristotelian tradition! However, he deliberated more on the notions of 'matter' and 'form' in a philosophic way. He did not regard 'body and soul' as two separate entities!

Copernicus (1473-1543), Galileo (1564-1543) and Kepler (1571-1630) discussed 'the motion of heavenly bodies', thus establishing the 'laws of planetary motion'. This became the foundation of scientific thought in the coming centuries. 'The Age of Reason (1558-1648)' had begun. This was the period of the 'Renaissance' in Europe. This was also the turbulent century of religious strife and scientific progress marked by such great names as Galileo, Kepler, Francis Bacon, Rene Descartes and of course Shakespeare and Rembrandt. It is said that science and philosophy were vanquishing superstition; modern Europe and modern mind were taking shape. 'The nature of physical reality' was being explained by some great minds, the ideas of whom would prevail for little more than two centuries, until further corrections are made to those ideas.

2. The Nature of the Physical World (Mechanical World View)

Sir Francis Bacon (1561-1626) was an English philosopher who had a major influence on the philosophy of the seventeenth century and later scientific thought. Bacon said, 'Let us understand nature with a goal of mastery over nature', and gave impetus to the development of modern inductive science. This was the beginning of the concept of 'materialism' in the nature of scientific thought, where the objective of science would not only be an 'inquiry of nature', but also 'mastery over nature' in order to 'exploit nature'. Rene Descartes (1596-1650), a French philosopher, mathematician and scientist was one of the most influential thinkers in human history, sometimes known as the 'founder of modern Western philosophy'. He developed the conceptual foundation of 'new mechanical physics' and tried to explain everything in the created world external to human beings. His method of systematic doubt impacted the subsequent development of philosophy. He argued that, 'the sciences must be founded on certainty', and wrote, 'Rules for the Direction of the Mind'. He said, 'I think, therefore I am', one of the most famous statements in Western philosophy. He is also known as father of the 'mind-body' problem, separating these two entities and thus creating a philosophy of 'dualism of mind and matter'. He also said that all the objective principles of physical sciences should be expressible in mathematical language. It created a divide between subjective and objective thought, considering objective thought only to be the subject of science. This was probably the

beginning of a divide between scientific thought and contemporary philosophy!! It culminated in providing a new dimension of thought to the Western world, finally leading to materialism over a period of time.

Influenced by the thoughts of Bacon and Descartes, Sir Isaac Newton (1642-1727), an English physicist and mathematician, laid the foundations of the 'principles of mechanics', popularly known as 'Newtonian mechanics', which formed the foundation of scientific thought in the 'physical sciences', for next two centuries. This was also the time when the Industrial Revolution was taking shape in Europe. Newly evolved principles of physical sciences helped to prosper the industry for the benefit of humankind. In essence, this was the rise of the 'mechanical world view', which in turn meant that one could predict the future path of a moving body, and could make its past known if its present condition and the forces acting upon this body are known. The paths of the motion of the planets could thus be predicted. It was thought that the most important force is 'Newton's gravitational force', which depends only on distance (and of course, on 'masses'). Looking from the 'classical mechanics' point of view, this concept was applicable to all branches of physics where various phenomenon were explained by the action of attractive or repulsive forces depending only upon the distance. Even in the case of the kinetic theory of matter, this mechanical view embraced the phenomenon of heat leading to a successful picture of the structure of matter.

An attempt was also made to apply this mechanical view to the case of the corpuscular and wave theory of light, but in order to define the electrical and optical phenomenon, serious difficulties were encountered. In case of moving charge acting upon a magnetic needle, the force does not depend only upon the distance but also upon the velocity of the charge. It was found that the force acts perpendicular to the line connecting the needle and the charge and indeed neither attracts nor repels!

Similarly, in case of optics, 'wave theory' found acceptance against the corpuscular theory of light. If viewed from a mechanical concept, it meant as if the waves are spreading in a medium consisting of particles with mechanical forces acting between them. But then the question arose: what is the medium through which light spreads and what are the mechanical properties of the medium? It was impossible to reduce the optical phenomenon to the mechanical view unless this question was answered. Since it was not possible to solve this problem, the mechanical view was completely given up.

One could see that with the advancing knowledge of the understanding of 'Nature', how the older 'mechanical world view' was rejected in favour of some new concepts now evolving. This new concept which appeared on the horizon of understanding of physical sciences since the time of Newton, probably one of the most important concepts, was that of 'Field'.

3. The Concept of 'Fields' and Relativity

Soon it was realized through great scientific imagination that it was neither the charges nor the particles, but the 'field' in the space between charges and particles that could describe the physical phenomenon. This thought was initiated during the latter half of eighteenth century and took its final shape in the nineteenth century while many European physicists were working on evolution of this new concept of 'field' and 'force experienced in an electric and magnetic field'. This was due to the pioneering work of Coulomb (1736-1806), a French physicist, Oersted (1777-1851), a Danish physicist, Gauss (1777-1855), a German mathematician, Ampere (1775-1836), a French physicist, Ohm (1789-1854), a German physicist, and Faraday (1791-1867), an English physicist and a 'natural philosopher'. This concept of 'field' and 'forces experienced in a field' not only proved to be most successful but finally culminated in the concept of 'electromagnetic fields', the mathematical equations that were summarized by a great Scottish physicist Sir James Clark Maxwell (1831-1879). Maxwell's equations described the structure of 'electromagnetic fields' governing the electric, magnetic and optical phenomena. The idea of 'electromagnetic waves' as a carrier of 'energy' brought a new thinking to the world of physical sciences, opening new vistas of technical innovations. The pioneering work of Heinrich Hertz (1857-1894) demonstrated the existence of 'radio waves' in 1887 (with inspiration from the work of Herman von Helmholtz (1821-1894) and Maxwell) and showed that the velocity of radio waves is equal to that of light. Hertz's thoughts inspired a new subject of 'electrodynamics', putting an end to all fruitless arguments about 'action at a distance'. A new concept was introduced to explain those phenomena of nature that were hitherto not satisfactorily explained.

1905 was an eventful year in the history of scientific thought. Einstein (1879-1955) presented three papers, one on the 'photoelectric effect' (Nobel Prize in 1921), the second one on 'Brownian motion', and the third one on the 'special theory of relativity'. Historians of science say that any one of those works would have made him equally famous! The fourth paper was published on 'mass-energy equivalence' the same year. Einstein presented his 'general theory of relativity' in 1915. The theory of relativity actually arose from the field problems. The old theories were full of inconsistencies and contradictions and hence Einstein found need to ascribe new properties to the spacetime continuum, which was supposed to be the canvas where events take place in this physical world. The entire concept of relativity developed in two phases. Initially, the special theory of relativity was evolved, applicable to the inertial coordinate system where the law of inertia per Newton's formulation was valid. This assumed that physical laws are same in all coordinate system moving uniformly relative to each other. This also considered that the velocity of light 'c' is always constant. These two assumptions, which were confirmed later by experiments, led to the deduction of the properties of matter such as changes in length and movement of rhythm of clocks as a function of velocity of motion. The laws of mechanics were no more the same. The old Newtonian laws of mechanics were no truer if the velocity of moving body approaches the velocity of light. The new laws based on relativity theory were later

confirmed through experiments. Another important consequence of this theory was that mass and energy were interchangeable, leading to the famous mass-energy equivalence relationship. The mass is actually energy and the energy has mass. Hence by combining two laws, the special theory of relativity led to the 'law of conservation of mass-energy'.

However, the spacetime continuum was given an even deeper meaning by the 'general theory of relativity'. It was no longer restricted to inertial coordinates. It even took into account the issue of gravitation. The new structure was formulated for the gravitational field. Gravity found a new definition as the 'curvature of the spacetime continuum'. Geometry was playing an important role in the description of the physical world! Gravitational and inertial mass are essentially the same; it is not merely accidental as it is thought of in classical mechanics. Relativity theory had the consistency and simplicity of its fundamental assumptions. The theory amalgamated all four dimensions of space and time. The theory also strengthened the concept of 'field' in understanding the behavior of the physical world. A new concept was introduced to help better understand the nature of 'physical reality'.

4. Concept of 'Quanta' and Quantum Mechanics

There were certain physical observations – to name a few, black body radiation, the photoelectric effect, specific heat of solids – that could not be explained by classical physics. New physical laws needed to be discovered in order to understand the behavior of subatomic particles. Matter is composed of elementary particles, could we say, the elementary quanta of matter. Therefore, energy is also composed of elementary 'quanta' such as photons, which are the energy quanta the light is composed of. The concept of quanta of energy was originated by Planck (1858-1947) while studying black body radiation (Nobel Prize in 1918). Incidentally, while speaking in a meeting of the German Physical Society on December 14, 1900, Planck presented his unusual ideas, which he himself could hardly believe, that various paradoxes faced by the classical theory of emission and absorption of light by material bodies could be removed if it is assumed that the radiant energy can exist only in the form of discrete packages, could be called light quanta. The thought created intense excitement in the audience and probably in the entire world of physics. Physics would not be the same thereafter. Planck established that the energy of quanta E, is directly proportional to the frequency of radiation of quanta f, linking with 'Planck's constant, h', another universal constant (E=hf).

Einstein successfully applied this idea of quanta five years later in 1905, in order to explain the empirical laws of the 'photoelectric effect'. Later, an American physicist Arthur Compton (1892-1962, Nobel Prize in 1927) conducted his classical experiment indicating that the scattering of X-rays by free electrons follows the same law as the collision between two elastic spheres. Therefore, in a very short time, this great idea of quanta of radiant energy was fully established. Then, Niels Bohr (1885-1962, Nobel Prize in 1922) in 1913, utilized this idea of quanta of

radiant energy to explain the behavior of electrons in an atom. It was thus possible to provide a logical interpretation to the planetary model of an 'atom' proposed by Lord Rutherford (1871-1937, Nobel Prize in 1908). Bohr then calculated the energies of various discrete quantum states of electrons, thus explaining that the emission of light is the ejection of light quanta with energy equal to the energy difference between two quantum states. This was the initiation of the 'quantum theory of the atom'. This, however, was not enough to describe the transition process of an electron from one quantum state to another, nor was it possible to calculate the intensities of various spectral lines.

However, an even more fundamental question needed to be answered: do light and electrons have a particle or wave nature? They probably have properties of both (the nature of a wave and a particle), but definitely not together at the same time. In order to answer such questions, the concept of description of atomic events happening in spacetime may have to be reconsidered. The new science had to formulate laws governing a set of particles rather than individuals, where the probabilities had to be discussed rather than the properties, where the laws governing the changes in time of the probabilities had to be thought of. This all was initiated in the third decade of twentieth century.

Prince Louis de Broglie (1892-1987, Nobel Prize in 1929), a French physicist, in 1925, gave an unexpected interpretation of Bohr quantum orbits, where the motion of the electron was supposed to be governed by some mysterious 'pilot waves', the propagation velocity and length of which depends on the velocity of the electron. Thus, de Broglie showed that various quantum orbits in Bohr's model were those that could accommodate an 'integral number' of so called pilot waves. The model of atom was therefore now thought of having the innermost orbit with the lowest energy state, and outer orbits with higher energy states. Schrödinger (1887-1961, Nobel Prize in 1933), a year later, extended these ideas into an exact mathematical form known as 'wave mechanics'. Wave mechanics successfully explained those phenomena that Bohr's theory could not explain, such as intensities of spectral lines and the fine structure of spectra, and even predicted some interesting phenomena such as diffraction of an electron beam, which could not have been imagined either in 'classical physics', or in the 'Planck-Bohr quantum theory'. 'Wave mechanics' thus gave a reasonably complete and self-consistent theory of 'atomic phenomena', and could also explain the mechanism of radioactive decay and artificial nuclear transformations.

Then there was an important turning point in the history of quantum theory. In 1927, Werner Heisenberg (1901-1976, Nobel Prize in 1932), a German physicist, developed a new treatment of 'quantum problems', by application of something called 'non-commutative algebra' (also known as 'matrix mechanics'), where (axb) is not necessarily equal to (bxa). It was soon realized that these two theories vis-a-vis Schrodinger's wave mechanics and Heisenberg's matrix mechanics, were physically identical though they were expressed in two entirely different mathematical

forms. However, Heisenberg's 'principle of uncertainty', so arrived by using this algebra, thus defining that one could never predict the exact position and momentum of a particle at the same time, was a turning point in the history of 'quantum theory'. This concept of uncertainty and the 'observer' affecting the 'observed' encountered resistance in scientific discussion. This will be discussed again in detail a little later with reference to an experiment.

One important issue of quantizing mechanical systems, because of the very high velocities involved that required relativistic treatment, was finally sorted out in 1929 by a British physicist P.A.M. Dirac (1902-1984, Nobel Prize in 1933, shared with Schrodinger), who formulated his famous 'relativistic wave equation'. Dirac's wave equation gave the perfect description of the motion of an electron at very high velocities (close to that of light), which also explained their linear and angular mechanical moments and magnetic moments. Dirac also predicted the possible existence of 'positively charged anti-electrons', the presence of which was found in cosmic rays a few years later. The theory of anti-particles was then extended to all the elementary particles, and therefore allowed for anti-protons, anti-neutrons and so on.

It was quite clear that the observer has a central role in 'quantum theory', which extends from spacetime to the properties of matter itself, however some scientists continue to dismiss the 'act of observation' as a nonentity. The act of observation, (and the tools used in observation such as electrons, photons) could not only alter but could determine what is desired to be perceived while studying the behavior of sub-atomic particles. An electron has both a particle as well as a wave-like property (and so does everything else in nature), but how and where such a particle is located is dependent on the very act of observation. This was known as 'quantum uncertainty' and was thought to be quite weird to start with. The particle exists only in a blurry state of possibility until its wave function collapses during observation. The object's behavior could only be defined as probabilities. No object could therefore assume a particular motion or place until the collapse of its wave function. Sometimes in twenties itself, Max Born (1882-1970, Noble prize in 1954), had established that the quantum waves are the 'waves of probability', and not the waves of material theorized by Schrödinger, answering the question: 'waves of what?'. These are statistical predictions; the wave of probability is nothing but a likely outcome! The quantum waves merely define the potential location that could be occupied by a particle. A probability wave is neither an event nor a phenomenon, it is just a description of likelihood of an event or phenomenon to occur. John Wheeler had once remarked that 'No phenomenon is a real phenomenon until it is an observed phenomenon'.
The two-hole experiment had proven this point of the 'act of observation'. The observer's look itself could collapse the wave function, and not only that, mere knowledge held in the observer's mind was good enough to cause the collapse of the wave function! The concept of 'thought' was entering in scientific discussions. In case of entangled particles, they even share a wave function! Furthermore, their wave function collapses together instantaneously even if they are light years away. Experiments done during 1997 to 2007 have proved this phenomenon. Physicists are

finding it hard to reconcile with this even if it is predicted by quantum theory reasonably well! Wave-particle duality in quantum weirdness has baffled physicists who describe it as impossible to intuit or formulate into words and even to visualize, thus invalidating common sense and general perception. It may be apt to quote Werner Heisenberg, who wrote in 1930 on the subject of 'spacetime' in his book on 'The Physical Principles of Quantum Theory', as follows:

"Although it is perhaps possible in principle to diminish space and time intervals without limit by refinement of measuring instruments, nevertheless for the principal discussion of the concepts of wave theory, it is advantageous to introduce finite values for values of space and time intervals involved in the measurements and only pass to the limit zero (Del x->0; Del t->0) for these intervals at the end of the calculations. It is possible that future developments of quantum theory will show that the limit, zero, for such intervals is an abstraction without physical meaning; however, for the present, there seems to be no reason for imposing any limitations."

It appears that philosopher physicist Heisenberg had realized that the concept of spacetime is only a percept to give some physical meaning to the physical phenomenon to be viewed in this cosmos. Interestingly, the great English philosopher, thinker and mathematician Bertrand Russell (1872-1970), while writing in his book on 'The Analysis of Matter', addressed the subject of spacetime as follows:

"We might suppose, as Henry Poincare once suggested, and as Pythagoras apparently believed, that space and time are granular, not continuous - i.e. the distance between two particles may always be an integral multiple of some unit, and so may the time between two events. *Continuity in the percept is no evidence of continuity in the physical process."*

However, as seen in the discussion above, the thirty years from 1900 to 1930, after an unusual thought of 'quanta' by Planck, were crucial in the development of 'quantum theory', which at that point had taken some shape. Historians of science say that very little theoretical progress has been made in the decades to follow these great developments except that experimental physicists could discover some more elementary particles and the presence of antiparticles. However, science is still struggling to understand the very fundamental existence of these elementary particles, their charges, masses, magnetic moments including their interactions.

It may be believed that if such a breakthrough is achieved at all, it may be through different concepts from the known concepts of today. It may require completely 'out of the box' thinking. It may be necessary to involve the concept of 'consciousness', and the role of the 'conscious observer'. It may also be necessary to incorporate bioscience and combine it with theoretical physics in order to understand the evolution of life and nature itself.

5. Biocentrism - Principles

It now appears that some deeper understanding of Bioscience and Theoretical Physics may help to understand life and the reality of nature. Dr. Lanza has come out with some interesting principles of 'biocentrism'[7,8], which are outlined hereunder:

First Principle - What we perceive as reality is a process that involves our 'consciousness'.

Second Principle - Our external and internal perceptions are inextricably intertwined. They are different sides of the same coin and cannot be separated.

Third Principle - The behaviour of all the particles - subatomic or even objects - is inextricably linked to the presence of an observer. Without the presence of a 'conscious observer', they exist at best in an undermined state of 'probability waves'.

Fourth Principle - Without consciousness, 'matter' dwells only in an undermined state of probability. Any universe that could have preceded consciousness only existed in a probability state.

Fifth Principle - The very structure of the universe could be explained only through biocentrism. The universe is fine-tuned for life, which makes perfect sense as life creates the universe, not the other way around. The universe is simply the complete spatio-temporal logic of the self.

Sixth Principle - Time does not have a real existence outside of animal sense perception. It is the process by which we perceive changes in the universe.

Seventh Principle - Space, like time, is not an object or a thing. Space is another form of our animal understanding and does not have an independent reality. We carry space and time around with us like turtles with shells. Thus, there is no absolute self-existing matrix in which physical events occur independent of life.

These principles of biocentrism and concepts of quantum theory will now be used to explain an interesting experiment conducted very recently, regarding how human emotions create physical reality in space-time! Physicists are finding it difficult to come to the terms with such phenomena that are unexplainable with the present knowledge. Biocentrism could, however, give some meaning to our understanding of nature and life as such.

6. Human Emotions Create Physical Reality

Three different scientific studies [13,14] done by different teams of researchers in the U.S. have proved something really extraordinary. When these researches connected the three discoveries, something shocking was realized. *Human emotion literally shapes the world around us, not just our perception of the world, but reality itself.* In the first experiment, human DNA, isolated in a

sealed container, was placed near a test subject. Scientists gave the donor an emotional stimulus and fascinatingly enough, the emotions affected the DNA in the other room. In the presence of negative emotions, the DNA tightened. In the presence of positive emotions, the coils of the DNA relaxed. The scientists concluded that '*human emotion produces effects [that] defy conventional laws of physics.'*

In the second, similar but unrelated experiment, a different group of scientists extracted leukocytes (white blood cells) from donors and placed them into chambers so they could measure electrical changes. In this experiment, the donor was placed in one room and subjected to 'emotional stimulation' consisting of video clips, which generated a range of different emotions in the donor. The DNA was placed in a different room in the same building. Both the donor and his DNA were monitored, and as the donor exhibited emotional peaks or valleys (measured by electrical responses) the DNA exhibited the identical responses at exactly the same time. There was no lag time, no transmission time. The DNA peaks and valleys exactly matched peaks and valleys of the donor in time.

The scientists wanted to see how far away they could separate the donor from his DNA and still get this effect. They stopped testing after they separated the DNA and the donor by 80 km and still had the same result: no lag time, no transmission time. *The DNA and the donor had the same identical responses in time. The conclusion was that the donor and the DNA can communicate with each other beyond space and time.*

The third experiment proved a bit shocking! Scientists observed the effect of DNA on our physical world. Light photons, which make up the world around us, were observed inside a vacuum. Their natural locations were completely random. Human DNA was then inserted into the vacuum. Shockingly, the photons were no longer acting randomly. They precisely followed the geometry of the DNA. Scientists, who were studying this, described the photons as behaving '*surprisingly and counter-intuitively'*. They went on to say that '*We are forced to accept the possibility of some new field of energy!'* They concluded that *'human DNA literally shapes the behavior of light photons [that] make up the world around us!* So when new research was done, and all of these three scientific claims were connected together, scientists were shocked. *They came to a stunning realization that if our emotions affect our DNA and our DNA shapes the world around us, then our emotions physically change the world around us!*

Furthermore, *we are connected to our DNA beyond space and time.* We create our own reality by choosing it with our feelings. Science has already proven some pretty mind-blowing facts about 'the universe' we live in. All we have to do is connect the dots. We may now provide a scientific explanation to this amazing phenomenon by utilizing already well-established concepts of quantum theory and wave mechanics. We will, however, introduce a new concept of 'field', and we will call it the' field of consciousness'.

7. Quantum Science and Consciousness Explains the Physical Reality of Emotions – the Concept of 'Field of Consciousness'

The explanation of the above phenomenon given here is based on the *'theories of quantum physics'*, and on the fundamental tenets that, '*life and consciousness are the keys to understanding true nature'*. We would like to introduce the concept of a new field; the one that scientists have been talking about. We may call it the '*field of consciousness'* and something like the 'electromagnetic field'. We also agree with Dr. Robert Lanza, who says, '*Biocentrism is the only humanly comprehensible explanation for how the world can be like that*[7,8]*'*.

According to the thoughts of Einstein and many others during the beginning of the twentieth century, the concept that independent events can happen in separate non-linked locations - a very cherished concept called 'locality' - *fails to hold at atomic and sub-atomic level*, and it seems that there is evidence that this non-adherence of locality extends reasonably well to the macroscopic world. While we study subatomic particles, the observer is very much in the picture and he alters and even determines what he wishes to perceive. *The very presence and even methodology of the observer gets wonderfully entangled with what he indeed wishes to observe and the results thereof.* We have already considered the wave and particle nature of the electron (dual nature of particle, but not at the same time), but how and where such a particle is located is more important, and it will always remain dependent on the observer and his act of observation.

In addition, there was another core concept developed by Einstein in relation to discrete entities and spacetime where the speed of light (denoted by c) is constant, which was important to be taken into account for any information to travel and that events in one place cannot influence events at another place simultaneously. This view had been considered true for almost a century but now some new thinking and experiments have shown that this is not the case for all kinds of information propagation. Einstein and his colleagues, while dealing with particle entanglement (in their famous EPR correlation by Einstein, Podolsky and Rosen), had even dismissed quantum theory's prediction that a particle could somehow know what another particle thoroughly separated in space is doing, and attributed such observations to as not yet identified local contamination (Einstein called it a 'spooky action at a distance'), thus burying the true weirdness of quantum theory below the public consciousness. Who could dare say in those days that, 'Einstein was wrong!!'

But Einstein was indeed proven wrong when in 1964, John Bell experimentally proved that *separate particles could affect each other instantaneously over great distances.* Now, according to 'quantum theory', everything in nature exhibits a 'particle nature' as well as a 'wave nature', and the behavior of the object could best be described only by 'probabilities'. *Any particle could assume motion or a particular place only when its 'wave function' collapses.* Therefore, it was evident that an observer could only look at the particle when its wave function collapses. Interestingly, it also became clear that mere knowledge in the observer's mind was good enough to cause the collapse of the wave function!

As if this was not enough! *Whenever entangled particles get created, the pair shares a wave function. Therefore, when the wave function of one particle collapses, so it happens for the other particle even if they are separated by millions of light years.* Here, the 'principle of

complementarity' gets invoked. That is, if one particle has a spin 'up', the other particle of the pair instantly transforms from being a mere probability wave to an actual particle of opposite spin. They really are so intimately linked that there is no influence of 'space' or 'time' on their behavior. This is fantastic indeed!! Experiments have revealed that these small particles have some kind of ESP. It has been observed that if one particle randomly decides to go one way, its twin always follows with the same kind of behavior (complementary action) at the same moment, instantaneously, irrespective of their separating distance. Einstein's spacetime has no impact on their behavior whatsoever. The behavior is considered 'instantaneous' because it happens at much faster than the velocity of light, the limit of the testing system. It could be at a velocity of c^2 or even higher! (We hold the view that 'thought waves ' probably travel at a velocity of c^4).

Therefore, even scientists making measurements get perplexed by such phenomena, probably knowing reasonably well that they are predicted by 'quantum theory' to an extent, that *the entangled particles will instantaneously reflect the same action or state even if they are separated by any distance whatsoever.* Therefore, disproving Einstein's old concept of 'locality' with no effect of spacetime on such phenomena, it is also evident that these observed entities are indeed floating in a 'field' hitherto unknown. We will now call this as the *'field of consciousness', where any phenomenon is not limited by the spacetime concept theorized by Einstein* more than a century ago. What probably happened in this experiment was that the stimulation experienced by the second particle (which happened to be far away) as a result of original stimulation to the first subject particle (according to the theory described above), reoriented the photons lying in the 'field of consciousness' of the second particle according to the stimulation experienced by the second particle. In addition, this happened beyond the spacetime of Einstein's general relativity. Thus, scientists have rightly concluded that human emotion physically shapes reality.

Now, the question may arise, 'Why does it not happen at macro level? ', The reason for this is that as the object gets larger in size, its wavelength gets smaller. *Therefore, once you are in the macroscopic domain, the waves are too close together to be noticed or even measured. The waves are, however still there!* Therefore, even the wave function is very much definable. With very small particles, if they are not observed, they could not be considered to have any real existence in space. Quantum waves, therefore, merely define the potential location a particle could occupy. The wave probability is neither an event nor a phenomenon; it is actually just a description of the likelihood of an event or a phenomenon that may occur. *Nothing really happens unless the event is actually observed. Nothing is real unless it is perceived***.** Some new experiments have now shown that even in the case of large molecules, it has been indicated that quantum reality does extend into the macroscopic world we live in. In one experiment conducted a decade ago or so, $KHCO_3$ crystals exhibited 'quantum entanglement'.

It therefore appears that there is nothing like the reality of 'spacetime'. It is just a percept to view this so-called physical universe. If we accept these thoughts, we may realize that we in the Western world are coming closer to the Indian sage concept of spacetime and the origination of life long ago. We will discuss this idea in the following section.

8. Vedic and Upanishadic Thoughts on Spacetime Reality & the Ultimate Truth

Vedic and Upanishadic thoughts are directed towards enquiry into the nature of truth. Not only that, the Vedas are also the discovery of truth, the laws of nature, the universe, and beings thus leading to ultimate truth (the enquiry into truth means the discrimination and determination of 'real' and 'unreal'). The word 'Veda' comes from the word 'Vid', thereby meaning 'to know'. The Vedas are supposed to be 'apauruseya grantha', meaning not authored by man. These were revelations of the ultimate masters/sages while they were in deep meditation, with the authors unknown, supposedly to have been finally compiled by 1500 BCE or so into four Vedas: Rig-Veda, Yajur-Veda, Sam-Veda and Atharva-Veda. The various Upanishads were supposed to have been compiled by 500 BCE, and therefore the period up to 500 BCE is known as the 'Vedic Period'. *This ancient knowledge considers life and consciousness to be the fundamental tenets of existence,* and therefore discusses laws governing the individual, life, universe, the ultimate creation and their relationships to one another. It answers fundamental questions such as 'who am 'I'?' and 'what is the objective of the existence of life?'. Interestingly, it also talks of 'materialism' as well as 'non-materialism' while modern science only talks of a 'materialistic universe'[15,16].

The Vedas consider three aspects of life. These are 'the individual' (microcosm), 'the universe' (macrocosm), and 'the creator' of both. It also talks of a 'cause and effect' relationship. The microcosm and macrocosm are made up of five elements: space, air, fire, water and earth, in that sequence. How did these five elements come into being? These elements could not have created one another, therefore there should be a cause. That cause could be called the 'creator'. It establishes that the 'individual' is a part of the 'universe' and cannot exist without the universe and vice-versa. But before we discuss this aspect of 'creation', let us deliberate on some important aspects such as real and unreal etc.

The real (Sat) is considered that which is changeless and remains the same at all times; it is not at all a function of time. However, unreal (mithya) is that which changes with time, and hence is not real. This world exists and is experienced as well, but everything in it changes with time, and hence it is unreal. Every object in this world is just 'energy in motion' (that is why one is not able to determine the position and momentum of a particle correctly, as per 'Heisenberg's principle of uncertainty', a basic tenet of 'quantum mechanics', and everything could be defined only as a 'wave of probability'). Everything, from subatomic particle to the cosmos is in a state of flux. But for every change, there has to be a changeless substratum that is beyond 'spacetime'. This eternal factor has been called 'Brahman', the reality as described in the 'scriptures'. The changeless reality can only be distinguished from everything once the changing nature of everything else is realised. The scriptures that indicate the truth, which is beyond the mind and the senses, are the valid means of real knowledge. The enquiry into the nature of truth, however, has to continue.

'I', the observer of this cosmos is always present, as I am experiencing this cosmos. Since 'I' am ever present, 'I' alone am real and all else other than me is unreal. Since 'I' cannot identify myself with this body or mind, which is ever-changing, what is left is the 'self (Atma/soul)' that is the real 'truth'. What is 'self' then? That which is other than the gross, subtle or causal bodies

and witnesses all three states of 'consciousness' (waking, dream and deep sleep state), and of the nature of existence-consciousness-bliss is the real 'self'.

The range of human experience has a wide bandwidth and is varied. We normally experience this physical world as sound, touch, form, taste and smell. We experience the emotional world as desire, anger, love and compassion etc. The intellectual world is experienced as concepts, ideals and imagination etc. We may also experience the absence of all of them. These experiences are classified into three states of consciousness known as waking, dream and deep sleep states. In the waking state, we identify ourselves with this gross body. However, it may not be possible to function through this gross body without identifying with the subtle and causal bodies. In the waking state, the objects in the world that seem to be real are experienced through sense organs; the objects and events appear to have a cause-effect relationship. In the dream state, we experience the impressions gathered in the waking state while we are in sleep state and the self is identified with the subtle body. The mind creates, sustains and ends not only the dream world, but also the enjoyer of this world. The conscious thinking done by the intellect does not play any role in the dream state (this is what is known as 'Freud's theory of dream analysis' in the Western world). Dreams are normally either the unfulfilled wishes or the impressions of the individual during the waking state and do not require gross manifestation.

The deep sleep state is very important where the 'self' is identified with the causal body; one gives up identification with the gross and subtle body. In this state, there is complete absence of experience of objects, emotions and thoughts. One experiences the joy of one's true nature. In this state, there is neither the doer of any action nor the enjoyer of this world. Hence, we can say that in this deep sleep state and *in the absence of thoughts, there is no concept of spacetime or duality. Nevertheless, 'I' do exist in this state as well.*

Therefore, the nature of the true 'self', the 'Atman', which is quite different from these three bodies but witness to all three states, is of the nature of Sat-Chit-Anand, existence-consciousness-bliss. Existence (Sat) is that which remains unchanged at all times. Consciousness (Chit) is of the nature of absolute knowledge 'I am'. Bliss (Anand) is of the nature of absolute happiness. Therefore, it could be summarized that that existence-consciousness-bliss is not the attribute but the aspect of one self. The self is 'infinite' and therefore the Sat-Chit-Anand is really one. I am therefore 'immortal' and that is also my true nature. Now it is necessary to understand the true nature of this universe. It has been already explained that an individual is a part of this universe and cannot exist without it.

The sages considered twenty-four factors constituting this universe. These are the five elements (pancha-mahabhutas), the five organs of perception (panch-jnanendriyas), the five organs of action (panch-karmendriyas), the five pranas (pancha-pranas), and the four thought modifications, mind, intellect, memory and ego (mana, buddhi, chitta, ahankar). However, none of these factors, on their own or together, could be the cause of the others. How did they emerge? As discussed earlier, a cause must lead to an effect. Therefore, this universe must have a cause, which must exist before effect. Since truth alone existed before anything like names, forms or the qualities of this universe came into existence, truth is the cause of this universe. But truth is changeless and hence it cannot become anything other than itself, which is of the nature of existence-consciousness-bliss. The ever-changing universe does exist according to our

experience so the question arises of how a changing entity could emerge from a changeless cause.

9. The Concept of 'Maya'

The question above has been explained by 'Vedantic thoughts' by postulating the concept of 'Maya' (illusion) - something that appears to be, yet is not. From the point of view of the 'universe', the 'truth' alone could be its cause, however, from the point of view of 'truth', it should have no effect. This is due to 'Maya', which is described as an 'illusion'. That is why it is said that we are in an 'illusory universe'. Maya is supposed to have two powers, one of which is the nature of 'ignorance' that veils the truth. Therefore, this power by itself cannot create the universe. However, the other one is the 'creative power' that projects the entire universe of names and forms as well as manifests inherent impressions though it could not do so without veiling power. Vedanta further explains that the 'truth' endowed with 'Maya' is called the 'creator of the universe' (Isvara/Brahman). Maya is the creative power of the 'Isvara', which is worshipped as 'Shakti'. The power of Maya, which is unfathomable, could make the impossible seem real. This is the power of Maya that has created this boundaryless cosmos from beginning-less time and may continue to do so endlessly. There is, however, no existence of Maya apart from 'truth', and without existence, nothing could exist, therefore 'Brahman alone has intrinsic existence; 'Maya' therefore depends on this 'truth' for its existence. However, in the 'truth', there is no trace of 'Maya', therefore, 'Maya' gets destroyed upon knowing the 'truth'[16].

Maya is supposed to have three qualities. The first one is 'Sattvaguna', characterized by 'knowledge'; the second one is 'Rajoguna', characterized by the nature of 'activity', and the third one is 'Tamoguna', characterized by 'inertia'. These three characteristics of Maya pervade the entire 'universe' and 'creation', and only by their various combinations can an infinite variety of properties be created. There are two causes to create any object - one is a material cause and the other is an efficient cause. These two causes, however, are different from each other. The question arises: what are the material and efficient causes of the 'universe'? The five elements are the material cause of the 'universe'. These five elements must have emerged from the 'truth'. Similarly, the efficient cause of the universe must be 'truth' alone. But, whenever the material and efficient causes are the same, the created result is an 'illusion'. Like in the dream, the dream world is a manifestation of the waking mind, which is its creator, sustainer and destroyer. Therefore, a dream is an illusion and it appears that there is no logical sequence to creation. However for us, this waking world only appears to be real, which is governed by natural laws having a cause-effect relationship. Considering this, Vedanta has then explained the sequence of creation.

10. The Evolution of Five Elements

Now let us discuss the evolution of five elements[16], which is the most crucial concept in understanding the physical nature of Vedantic philosophy scientifically.

Tata akasah sambhutah, akasad vayuh,

Vayustejah, tejasah apah, adbhyab prithvi. (*In Sanskrit*)

From Maya, space was born, from space, air, from air, fire, from fire, water and from water, earth was born.

Maya first created the five subtle elements in the order of subtle to gross. The object is subtler if it is more pervasive and it has more perceivable qualities. It is subtler if it has a fewer number of qualities. It is said that 'truth' is subtlest because it is all pervasive, attributeless and beyond the cognition of any instruments of knowledge. Therefore, 'space', which is the subtlest of the elements, was the first one created by Maya. Space has the quality of 'sound' because sound needs the medium of space through which to travel. 'Air' was born from 'space' as 'air' is less pervasive. Air has the qualities of sound and touch. Air, therefore, can be heard and felt. Then 'fire' came out of air as it is less pervasive than air. Fire has the qualities of sound, touch, color and form. Therefore, fire could be heard, felt and seen. 'Water', which is less pervasive than 'fire', 'air', and 'apace', was next to be born. Water has the qualities of sound, touch, color & form and taste. It can be heard, felt, seen and tasted.

The last in the sequence of evolution is the 'earth' because it is grossest and the least pervasive of all the elements. It has the qualities of sound, touch, color & form, taste and smell, and could therefore be heard, touched, seen, tasted and smelled. These elements could only be perceived as sense objects after they become gross. Maya is the material cause of the five elements, and the material cause is never different from the created object. Therefore, all the five elements carry all the qualities of Maya. We discussed earlier that the ultimate material cause of the universe could be 'truth' alone, and therefore, 'truth' should pervade all the five elements. This is exactly like the gold that pervades all the gold ornaments. The question may then arise, when did Maya create these five elements? This can be understood only if it is accepted that at the time of the dissolution of the universe, the three qualities of Maya remained in their yet to be manifested form in a state of equilibrium. The process of creation began only when this balance or equilibrium was disturbed.

Incidentally, this mechanism of physical evolution could well be seen in the light of modern scientific theories of evolution such as the 'Big Bang Theory'. From 'singularity' during the pre-Planck time era, space had to be born first for creation of the universe because the universe needs space to evolve. Space has the quality of sound and the universe was created with the primordial

sound of 'OM'. Similarly, the sequence of evolution of other elements of air, fire, water and earth could be debated (we leave it to the imagination of the reader to make it out for herself).

Three qualities of 'Maya' were discussed earlier. The first one, 'Sattvaguna', has its main characteristic as 'knowledge'. Therefore, the five organs of perception i.e. the organs of hearing, touch, sight, taste and smell were born out of the 'Sattvic Aspect' of these five elements. Since each element has its own special quality, the corresponding sense organ was evolved to perceive that special quality. The inner instruments of the mind, intellect, ego and memory are also formed from the total 'Sattvic' aspect of these five elements. The inner equipment, generally called 'mind', is nothing but a continuous flow of thought modifications, which are classified into four depending upon the function it performs. These are mind, intellect, ego and memory. The mind consists of thoughts in a state of volition and is indecisive. The intellect is the thoughts in a state of decision such as reasoning, observation and conclusion. Intellect makes one think logically and decisively. The ego is the thought, 'I am the doer'. It is the notion of individual ownership of actions and the sense of individuality without pride. Memory has the function of reflection and recollection.

From the 'Rajasic aspect' of these five elements, the organ of speech (tongue), grasping (hands), locomotion (legs), procreation (genitals) and excretion (anus) is formed. However, from the total Rajas aspect of these five elements, the five vital airs, Pranas are formed. The rajas guna is characterized by the activity and hence the rajasic aspect of Maya that manifests into activity. These five organs of action respond to the universe by activating the body and the five pranas to provide power to all functions of the body to keep it alive through various physiological functions.

The manifestation of the Sattvic and Rajasic aspect of the five elements lead to the constitution of the total 'subtle' body or the 'subtle universe' while the non-manifesting condition of the five elements and the three qualities is nothing but the 'causal' body. The grossified five elements are born out of the 'Tamasic' aspect of these five elements in a process called 'Panchikarnam'. This happens in a very interesting way. The tamasic aspect of each element divides into two parts, half remaining intact while the other half gets divided in to four parts, getting attached with the other four elements. Panchikaranam is now complete and the gross body is formed out of these five grossified elements. Each of the gross elements has, therefore, the quality of all the other elements. These elements are now perceived by the senses. The combinations of all these elements form the entire gross body and the universe. Tamasic guna, however, is characterized by 'inertia', which means it cannot know itself. The gross body cannot function without the subtle body. Therefore, whenever the subtle body leaves the gross body, the gross body disintegrates and merges into the five gross elements.

It is only the gross body that needs the concept of spacetime in order to perceive this universe and to understand the so called physical laws of nature. There is no concept of spacetime in the context of the subtle and causal body, without which the gross body cannot function.

11. The Relationship of the Individual with the Total (Creator, the Brahman)

The question may then arise, how an individual is related to the truth if this whole universe has arisen from Maya, which happens to be inherent in the truth? But, the part could never be separate from the whole; therefore there is an identity or oneness between the 'microcosm' and 'macrocosm'[16]. This could be further explained as follows:

The total subtle elements form the individual subtle body; likewise, the individual mind is part of the total mind. Similarly, the total gross elements constitute the individual gross body, therefore the individual gross body (Pinda) is a part of the total gross body (Brahmanda). Therefore, the total and individual are supposed to share a whole-part relationship. The truth, however, which is the pure self, is the original cause of the total subtle and gross elements. Therefore fundamentally, there is always an identity between the individual and the total as if the waves are a part of the ocean in terms of name and form, but they are the one with respect to their essence, which is water. Vedanta further clarifies the concept of essential oneness as follows:

The individual (Jiva) is nothing but the reflection of truth (Brahman), identifying itself with the gross body. The individual may consider himself/herself essentially different from Brahman because it is 'self' conditioned by ignorance (Avidya), which is mainly tamasic, but when conditioned with Maya, it is Brahman. This difference is only due to conditioning. The 'truth' or 'the Brahman' is infinite, and it wields inherent creative power and total conditioning (Maya) and appears as the world of things and beings. The truth, when conditioned with Maya, is Brahman, and is all-powerful, all-knowing and all-pervading. He is the efficient and material cause of this universe. The Brahman, knowing His true nature, cannot get overpowered with Maya, hence He is 'Mayapati'. His Maya is mainly Sattvic and therefore cannot bind. Since the individual identifies with the finite gross and subtle bodies and lives as a finite creature, he is enslaved by conditioning. Therefore, his visualization of the spacetime as reality is only because of this conditioning, which is really not the truth. The vision of an individual is born purely out of ignorance, that he continues to accept himself as finite, falsely identifying himself with beginningless time although he is infinite. The essential oneness of the individual with the Brahman can only be realized through enquiry into the statement 'that thou art-Tatwam Asi'.

12. Enquiry into the Nature of Truth

The subsequent question may arise, 'why does an individual fail to recognize the truth?' It is because the individual is endowed with 'ego' and 'limited knowledge'. This need not be confused with the new age philosophy of 'overcoming the ego', which aims to completely erase the ego. Transcending ego doesn't mean that it may disappear. It only means that one needs to be aware of it and no longer limited by it. Ego will always remain an integral part of 'self', as explained earlier that the ego is the thought 'I am the doer'. The very goal of human life is to

realize one's own true nature, and the very purpose of 'Vedantic' philosophy is to obtain knowledge of the 'self'. One such thought is 'Tattwam Asi-that thou art'- from Chandogya Upanishad of 'Sama Veda', where it is explained that truth (Tat) alone is (Asi) you (twam). That also means that there is a complete identity or oneness between the two, the two being truth (the supreme creator) and 'self'. This is further clarified in the Upanishadic teachings[16].

'Thou' is the one identified with the 'gross', and 'subtle' bodies, but thou is nothing but the pure consciousness free from all conditioning, and can be appreciated in deep meditation. 'That' is the 'supreme consciousness' endowed with omniscience, omnipotence and omnipresence, which is again pure consciousness free from all conditionings, and therefore, there is no contradiction regarding the essential oneness between the two from this point of view. We must absorb the indicative meaning rather than the literal meaning. This is realized only when we shift our attention from conditioning to the unconditioned self or truth. This enquiry could initiate either from the 'creator' that is He in essence, or it could also initiate from the 'individual' or 'who am I in essence?' Either way will culminate in the realization that 'I am the infinite truth-Aham Brahmasmi. Therefore, according to Vedantic teachings, those beings in whom the vision of truth is born are liberated even while living life. Self' cannot be known as an object of knowledge, it can be revealed only by subtle and indicative methods. Therefore, the Vedas use mystical language.

Vedanta is the means of 'self-realization'. One needs to realize that 'self' in him is 'self' in all, that all is truth alone and that 'I' am 'infinite reality'. 'I' am unattached and of the nature of existence-consciousness-bliss (Sat-Chit-Anand), and the formless awareness. The ignorant one considers himself to be a finite, transmigrating individual and the world to be real. The self, different from three bodies and three states, is totally unaffected by them and liberated. The self is ever existent, the witness of all and infinite and therefore, has no limitation. The self is basically the 'knowledge principle' and illuminates all 'thoughts', the 'life principle' that enlivens all 'beings'. Since the liberated one knows that 'self' in me is the same as self in all, he loves all as his own self. Space is all-pervasive, but the self pervades even space. It is therefore beyond space.

Therefore, there is no concept of spacetime for the 'self', which is 'me'.

The question may however arise, what is the real purpose of this knowledge? The answer could be that by this immediate knowledge that 'I am Brahman alone', one is free from the bondages of all actions (Karmas). By this knowledge, one definitely does not gain any special power, unworldly experiences or worldly achievements. *One needs to continue performing worldly actions and do extraordinary things.* Though this knowledge does not create anything new, it removes the ignorance about the 'self'. The 'I am finite' notion is removed. 'I am the doer' is what an ignorant person thinks, therefore he enjoys and suffers as a results. The realized 'soul' understands that he is neither the doer nor the enjoyer, and is therefore free from the bondages of actions. He performs duties with complete detachment, not compelled from within by a sense of

incompleteness, but rather out of a sense of fulfilment and a love for all of humanity. He always experiences freedom even in action and does not seek freedom from action. The knower of the 'self' attains 'supreme bliss' in this world itself. This is what has also been spelled out even in 'Geetopadesham' [15].

One, which is constantly changing, is known as the 'Samsara', the universe. The realm of 'time', 'space' and 'objects' is this 'Samsara', which is not only 'Mithya', an illusion, an embodiment of 'Maya', but has limitations, thus causing sorrow. The knower of an object is not an object itself, but the knower of the 'self (truth)', becomes 'truth' itself. There is nothing like becoming; he realizes that his nature is 'supreme bliss' even while he is ignorant.

This is the essence of Upanishadic knowledge. These fundamentals of knowledge have been taken from the commentary of the 8th century sage Adi Shankracharya, who had elaborated on these concepts in 'Tattvabodha'[16], the enquiry into the 'nature of truth', the entire subject matter of Vedanta. Based on such thoughts, our ancients and sages have developed more than 2,500 years ago, the whole science and philosophy of life, which also became the principles of ethics and morality for a civilized society in the Vedic period. This was so universal in thought and principles exactly like science in modern times. The ancients had also developed other forms of studies such as astronomy, physiology, medicine and science etc. in their own fashion (we need not elaborate them here). The philosophy detailed herein were, however, given the color of 'religion' by some Western thinkers (who translated some of those works in English or other European languages) for reasons best known to them. It appears that our ancients were not only quite advanced but also mature in their scientific thoughts rather holistically, albeit not in a fashion understood by modern science (and also expressed in mathematical terms) and philosophy in today's times. It was based on knowledge gained during deep meditation, their experiences and statistical observations. After all, the mathematics of present times had not developed then!

13. Conclusion

In summary, the following conclusions can be made. The Western world started understanding 'nature' from the days of Greek philosophers (about 500 BCE or so) like Democritus, Socrates, Plato and Aristotle. However, the understanding of the world did not progress significantly again until the 16th century when Copernicus, Galileo and Kepler formulated the laws of the motion of heavenly bodies. Based on the philosophy of Rene Descartes, by separating the mind-matter relationship within the framework of the 'physical world' and by conceptualizing 'materialism', Newton developed 'Newtonian mechanics', which became the foundation of science for more than two centuries. This represented a 'mechanical world view' of 'certainty'. A view of the 'nature of reality' thus evolved with a concept of 'dualism'. This was perfectly fine in grosser terms. Then, in 18th/19th century, a new concept of 'fields', and 'forces in a field' was

developed, culminating in Maxwell's equations of 'electromagnetic fields', heralding in a new 'reality of nature'.

The twentieth century was a turning point in the history of scientific thought. The new concepts of 'relativity', which unified 'spacetime' and 'quantum mechanics', brought a new dimension to the entire thinking process. In quantum theory, the observer was now also playing an important role while observing subatomic phenomenon. The concept of 'uncertainty' creeped into the discussion, which was not easy to accept by a 'classicist'. Objects could only be defined as 'probability waves'. Nonetheless, modern science and technology developed by leaps and bounds. The world saw a phenomenal change in its entire thinking. We have now come to a juncture where it is getting difficult to advance farther in the fundamental understanding of nature.

The new concept of 'biocentrism' evolved during the last decade or so and brought in the concept of 'consciousness'. We invoke a new concept called the 'field of consciousness', something like an electromagnetic field. It is in this field of consciousness that several phenomena take place. Again, some new ideas on matter-mind-consciousness are taking shape to understand a new reality. Spacetime actually is not a reality, but just a mechanism of perception in which to view this universe. Ironically, this is something closer to what our ancients had envisaged more than 2,500 years ago.

In the Eastern world, sages, thinkers and philosophers had established the Vedantic philosophy (Indic thoughts) about three millennium ago, long before the Western world began dwelling on such ideas. They defined the concepts of 'real' and 'unreal', 'life' and 'consciousness' and 'microcosm' and 'macrocosm' with the relationship among them defined with absolute clarity. They discussed the evolution of the five gross elements that physically constitute this universe. They developed various sciences based on their contemplation, observation and experience. They concluded that spacetime is indeed not a reality, but just a means with which to view this illusory physical world of 'Maya'. Truth alone is real and that is 'me', the 'consciousness', which is a part of the 'supreme consciousness'. The Vedics had thus established a clear relationship among matter-mind-consciousness. Aham Brahmasmi – Tatwam Asi.

References

1. (Capra Fritjof , 1976), *The Tao of Physics*, Flamingo
2. (Deshpande D, 2007), *Modern Sciences in Vedas*, Mumbai, Bhartiya Vidya Bhavan.
3. (Einstein, Albert, Infeld Leopold, 1938), *The Evolution of Physics*, New York, Simon and Schuster.
4. (Heisenberg Werner, 1971), *Physics and Beyond*, New York, Harper and Row,
5. (Heisenberg Werner, 1961), *Physics and Philosophy*, New York , Harper and Row ,
6. (Klostermaier Klaus K., 2004), *The Nature of Nature – Exploration in Science, Philosophy and Religion*, Chennai, The Theosophical Publishing House.
7. (Lanza Robert, 2009), *Biocentrism*, Benbella Books Inc. Dallas

8. (Lanza Robert, Berman Bob, 2016), *Beyond Biocentrism*, Benbella Books Inc. Dallas
9. (Lidley David, 2008), *Uncertainty – Einstein, Heisenberg, Bohr, and the Struggle for the Soul of Science*, New York, Anchor Books.
10. (Lipton Bruce H., 2010), *The Biology of Belief*, Hay House India.
11. (Morris Richard, 1987), *The Nature of Reality – The Universe after Einstein*, New York, The Noonday Press.
12. (Pagels Heinz R., 1982), *The Cosmic Code*, New York, Dover Publication
13. (Rein Glein, Rollin MacCraty, Jan 2001), "*Local and Non Local Effects of Coherent Heart Frequencies of Conformational Changes of DNA"*, Institute of Heart Math.
14. (Greg Barden, May 2005), *"DNA Report"*, Institute of Heart Math.
15. (Swami Rama, 1996), *Perennial Psychology of the Bhagavad Gita*, The Himalayan international Institute of Yoga Science and Philosophy.
16. (Swami Tejomayananda, 2016), *Vedanta – Tattvabodha*, Central Chinmaya Mission Trust, Mumbai, India