Ancient Ṛshis, Modern Science and Brahman

Nimal C.N.
Department of Management Studies, ASIET, Kalady

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Ancient Vedic Civilisation researched, analysed and interpreted the questions of who we are and what the world is made up of. Over the years the Ṛshis moved from contemplating on the fascinating aspects of nature to empirical studies, which we now call rituals. But finally they came to the ultimate realisation in the deep and amazing philosophical musings of the Upaniṣads. Similarly the Western world is now going through the empirical phase of cosmic studies and the Large Hydrogen Colliders and Particle Accelerators. Modern scientists through Quantum Physics have reached certain findings which are remarkably close to the teachings of our ancient Ṛshis and Advaita. This paper takes a look at the routes taken. And contemplates the question whether modern physics and the ancient Vedic philosophy will converge and merge at some point in time in the future?

Whether it is ancient India or the modern western world human kind has always been on a quest for knowledge and a search for the meaning of life. This paper first considers how this thirst led to the evolution of systems and processes of thought in the Vedic times and second how similar or different was the same evolution in the west. It also seeks to understand where or how the two systems could converge and meet in the future.

Vedic Ṛshis

Ṛshis of the Vedic times were seekers of knowledge and rather than being philosophers who were divorced from ordinary day to day life they were scientists who studied the world in its true form. The word Ṛshi has its root in the letter R which means a word as per the Agni Purana, Chapter 348 (1954). Monier-Wil-

liams (1899) quotes how Tārānātha, who compiled the great (Sanskrit-to-Sanskrit) dictionary termed the Ṛshis as "ṛsati jñānena samsāra-pāram" that is one who reaches beyond this mundane world by means of knowledge. Monier-Williams (1899) also tentatively suggested a derivation for the word from the Sanskrit word dṛś , meaning to see. Which defines Ṛshis as practitioners of learning, who saw and heard, obviously more than what the ordinary person did, going beyond this material world through the acquisition of knowledge. Which agrees with the above theory.

The following description of the home of a Rigvedic Ṛshi (Rv ix, 112) according to RK Mookherjee (1990) shows him as a learned teacher in pursuit of knowledge while leading a rather ordinary life. He says "We different men have different aptitudes and pursuits. I am a poet; my father is a physician and my mother a grinder of corn."

And these Scientists right from the early Vedic times had studied and analysed the question of what the world is made up of. Where did it emerge from? What are its building blocks? This forms the basis of Indian science thought as well as its philosophy.

The Science of the Vedas

The Rig Veda according to sources is the oldest (Jamison, 2014) of the four Vedas. And the oldest layer of the Vedic texts themselves are the Samhitas which mainly contains invocations to deities like Indra, Varuna and Agni to get their benediction in winning battles and for the welfare of the public (Prasad, 2020). These were followed by Brāhmaṇas and Āraṇyakas which are connected to rituals. Vedanta or the end of the Vedas is the Upaniṣads which are philosophical works that relates to the achievement of the knowledge supreme.

Scholars like Adi Śankara have classified the different parts of the Vedas (Bartley, 2001). They termed the Samhitas as Karma Kanda (along with the Brāhmaṇas and Āraṇyakas which some classify as the Upāsana Kanda) and the Upaniṣads as the Jñana Kanda. Karma relates to actions and Jñana, knowledge. When we connect these to the process of learning Karma is empirical study while

Jñana is the use of logic and deduction. Upāsana is being intently engaged in the process of the empirical study. Of trying to analyse and interpret the findings of the study.

Continuing with the same line of interpretation, the Karma Kanda considers ways and means to tame energy, the different manifestations of which are electricity, wind and heat. The ancient Ṛshis, Scientists conducted a number of experiments to gain control of these elements to not only use them for different purposes but understand its intricate properties.

So what began as a study of material nature and its properties through empirical studies ended up as an understanding of the universe through logic and deduction. And also through Manana and Nidhidyasana, that is contemplation and internalisation of its true nature, which are the higher steps of learning (Brihadāraṇyaka Upaniṣad II iv 5).

Findings of the Upaniṣads

The Upaniṣads found out that there is only one Ultimate truth in the universe, from which all universe came to being, which they called Brahman. Now this being is very different from what the western world call God. Upaniṣads have defined Brahman as Satyam, Jñanam, Anantham Brahma (Taittiriyopaniṣad II.1). Anantam means something without limits. According to Swamy Sarvapriyananda (2015) there are three kinds of limits. One, there is no Desa Paricheda, it is not restricted by space that is it is Omni present or present everywhere. Second is there is no Kala Paricheda, not restricted by time, that is it has no beginning or end. Third there is no Vastu Paricheda, not separated as objects that is it is non dual, there is no second thing other than Brahman. That is it is Advaitam.

Satyam is what is real. What exists. As per Lakshana, the implied meaning, Is ness is real. That is existence itself is real. In fact there is no other reality. Existence is appearing as things. Just like water is appearing as waves. Everything is sitting in an ocean of existence. All particles are waves in this ocean of existence. Sat is Is-ness. It has no limitations in Desa, Kala and Vastu.

Swamy Sarvapriyananda continues that when we are conscious, when we dream or when we are in deep sleep there is only one thing that is the truth. If the conscious state was the truth you would have realised that in deep sleep also. If the dream world was the truth you would have seen it in the conscious state also. But what is true here is you. You are present in all the states. That consciousness of I is the only truth.

Jñanam is knowledge. And it has to be eternal. Any experience in life is pure consciousness with Vritti. Vritti is the impressions created in your mind through your experiences and learning. So experience is not eternal as it can change and hence not eternal. So whatever you learn in this material world is not true knowledge. The only thing that is eternal and unlimited is pure consciousness. It throws light on whatever happens during consciousness, sleep and dream. But itself is not affected. This pure Consciousness is Chaithanyam or Chit. So we can also say call Sat Chit Anantham Brahma. Which is the Hindu concept of God. And the ultimate reality.

East and West: Some basic differences

One of the main differences in thinking between ancient Indian civilisation and the western one was that while in the east religion accepted science and both went hand in hand, in the west they were separate and many a time hostile towards each other (Leveillee, 2011). The Vedic Scientists used religion as a route to finding the true nature of this material world. The Ṛshis took the help of Astronomy and the stars to understand cosmos, its creation, maintenance and destruction (Iyengar, 2016). So these are analysed and explained in the Vedas which form the basis of Sanatana Dharma. Just like the Ṛshis of India it was the scientists in the western world also over the years tried to find out what the world is made up of. Even while facing the wrath of religions.

Western Science and the foundations of the universe

The first credible and comprehensive picture of what are the building blocks of the modern world was the periodic table. Russian chemist Dmitri Mendeleev published the first recognizable periodic table in 1869, developed mainly

to illustrate periodic trends of the then-known elements. The periodic table has 118 elements which have been classified according to their atomic weight and valence. It also helped in finding or synthesising new elements as well as the properties and behaviour of the elements being so discovered.

While the whole premise of the periodic table was that all elements are made up of different numbers of atoms which was then the smallest known particle in 1897 JJ Thomson came up with the finding that there was something which was smaller than the atoms, that atom itself was made up of something called electrons (SHI, 20016). He showed that cathode rays were composed of previously unknown negatively charged particles, which he calculated must have bodies much smaller than atoms and a very large charge-to-mass ratio.

Within 15 years in 1911 Ernest Rutherford presented the first picture of the atom with its nucleus and electrons orbiting around the nucleus. In 1917 he performed the first artificially induced nuclear reaction in experiments where nitrogen nuclei were bombarded with alpha particles. As a result, he discovered the emission of a subatomic particle which, in 1920 he called the proton. In 1932, James Chadwick conducted an experiment in which he bombarded Beryllium with alpha particles from the natural radioactive decay of Polonium. The resulting radiation showed high penetration through a lead shield, which could not be explained via the particles known at that time. Chadwick interpreted the cause as neutron an uncharged (neutral) particle, of about the same weight as a proton.

In the late 1960s it was found that protons and neutrons are made up of two elements called quarks termed up quarks and down quarks (Carithers et al, 1995). The quark model was proposed by Murray Gell-Mann and George Zweig in 1964. Quarks combine to form composite particles called hadrons, the most stable of which are protons and neutrons, the components of atomic nuclei. The interesting aspect is that quarks are never found independently but only in mesons and gluons besides protons and neutrons. Till now particles which are smaller than the electrons and quarks have not been found.

Fields as the base of universe

Simultaneously in 1831 Michael Faraday discovered the electric and magnetic fields. When Faraday moved a magnet through a copper coil he found that it produced an electric current. Which was seminal as it led to Maxwell publishing his paper on electromagnetic fields which was the precursor of quantum field theory. James Maxwell mathematically described the same and his equations implied the existence of electromagnetic waves, a phenomenon whereby electric and magnetic fields propagate from one spatial point to another at a finite speed, which turns out to be the speed of light.

Faraday coined the term field in 1845. This field was more subtle than particles and were much more nebulous and abstract. In fact as per Hobson (2013) it was the proof that there are no particles in the universe only fields. Max Planck's study on radiation marked the starting point of Quantum Mechanics. Based on it Albert Einstein in 1905 proposed an explanation for the photoelectric effect, that light is composed of individual packets of energy called photons. This implied that the electromagnetic radiation, while being waves in the classical electromagnetic field, also exists in the form of particles.

In the 1920s Born, Dirac, Hysenberg and Schroedinger did a series of studies and realised that on the microscopic scales the world behaves in much more mysterious ways. One of the things they found was that energy isn't continuous. It is parcelled into lumps and is discrete. Combined with all the earlier studies this formed what is called the quantum field theory. Thus quantum field theory is the result of the combination of classical field theory, quantum mechanics and special relativity.

According to David Tong (2017) this applies to all particles in the universe. Thus, the bundles of energy emerging from the electron field becomes the electron particle and from the two quark fields the two different quarks. There are two more basic fields in the universe, the neutrino and boson fields. All these fields are connected to the each other like waves in water and interact with each other. When one of them oscillates and ripples it kicks off others creating a harmonious dance

between all these fields. And in space there is no such thing as pure vacuum. There will be no particles but there is a continuous dance of these fields. This is the Hysenberg's uncertainty principle which maintains that in the universe nothing can remain idle. These fluctuations can be measured. They follow all the principles of quantum mechanics. Fields interact with each other through four forces - gravity, electromagnetism and the strong and weak nuclear forces. In fact the field associated with gravity is time and space itself. Higgs field is responsible for mass of the particles.

He further states that the field Faraday envisaged is one of around 12 spread throughout the universe, this invisible fluid like substance that ripple and sways and forms the basic building blocks of the universe.

West meeting the East

Physicists are still hard at work to understand the universe as they are still stuck with many phenomena that remain unexplainable like the dark matter and dark energy. Twice scientists have come to a cross roads, first with the understanding of particles and what materials they are made up of and then quantum fields as a building block of the prescient world. So what is next? What will they find that the Ancient East has already found?

As per the Nasadīya Sūkta of the Rig Veda where the creation and origin of the Universe is explained in the calm recesses of the Brahman there rose a desire (Basham, 1954). In the calm unillumined cosmic water covered in darkness a primal seed of mind was born. We can say that in the ocean of pure consciousness a wave arose and a world of names and words came into being. But this is borrowed existence and at some time all these that are kinetic will go back to the calm of the potential during the primordial cataclysm that Sanatana Dharma calls Pralaya and the cycle will continue.

The modern west is likely to meet the Ancient East when they move away from the empirical phase of cosmic studies and the Large Hydrogen Colliders and Particle Accelerators and try to interpret the causation. Analysis, contemplation

and internalisation at an abstract level of the different material aspects that we do know of. Then they will come to the realisation that all material things in this universe are but a manifestation of an infinite ocean of existence. Of pure consciousness. It rises up as a wave in the ocean only to subside into it until the next wave arises.

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