

# VEDANTA IN THE LIGHT OF SCIENTIFIC INSIGHTS INTO THE NATURE OF REALITY

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[This paper corresponds to the “Infinity Foundation Distinguished Lecture” given by the author at the Vedanta Congress held in September 2005 in Orlando, Florida. They may exercise copyright on it.]

## 0. SUMMARY

### 1. INTRODUCTION

Vedanta is a large body of subtle elaborations of the field of spirituality. By Spirituality, we mean the rational attitude and action in the face of Reality. In other words, if a person knew what is the general nature of Reality and if at the same time he acted and thought in a rational way, then the kind of attitude towards the world and the kind of behavior that he will have and the knowledge that he would strive for, is designated as Spiritual. Thus, indeed, we contend that Vedanta and other spiritual literature of the world deals with Reality itself.

Literally, Vedanta means the end of the Vedas. The goal of the Vedas is to collect and present knowledge of all varieties that are of interest to human beings; however, unlike modern Science, the Vedas have a spiritual emphasis. In other words, in a sense, it is being said that even the worldly knowledge is to be provided and collected for the purpose of being used only in a good way for the benefit of all mankind. The word ‘all’ is to be emphasized here. Spirituality does not discriminate between peoples on any ground, including religion and sect. (That is why one of the standard Vedantic prayers prays for the good of all, rather than for the good of only those who are believers in the Vedas. Indeed, if this prayer was restricted only to the believers in the Vedas, the Vedas (as elaborated below) could have been called religious, but not spiritual.)

Since worldly knowledge (‘apara vidya’ in Sanskrit) is necessary for survival in the world, the Vedas provide a healthy mixture of the worldly and the spiritual knowledge (called ‘para vidya’). This explains why the Vedas are given importance. The knowledge under discussion includes, in particular, the knowledge of ‘yoga’ (which literally means ‘union with God’). The word ‘veda’ is derived from the Sanskrit ‘vid’, which means ‘to know’. Thus, ‘veda’ almost means Science. The word ‘vidya’ means ‘knowledge’ The English word ‘para’ (as, for example, in ‘paranormal’) is the same as the Sanskrit word ‘para’, and its approximate meaning is ‘beyond’. Then, ‘apara’ means that which is ‘not beyond’. The worldly knowledge is thus called ‘apara vidya’, and the (‘higher’) spiritual knowledge the ‘para vidya’. A deeper look shows that ‘para vidya’ must contain ‘apara vidya’. Thus, in our terminology, Spirituality includes Science, and the Vedas contain spiritual knowledge, part of which is worldly knowledge.

The 'Vedas' include knowledge of various kinds that was possessed in the ancient times. However, the ancients realized (and, I believe, very correctly) that knowledge of Reality and Spirituality was, by far, the most important knowledge. Because of this, they gave far more emphasis to this knowledge. There are four Vedas, out of which three (the Rig, the Saam, and the Yajur Veda) are relatively more ancient, and one (the Atharva Veda) is relatively young. The last one is after the time of Krishna, because in the Bhagvad Geeta, only three Vedas are mentioned.

The discussion of the 'higher' (or, in customary terminology, 'spiritual') knowledge was put more towards the 'end' of Vedas, and thus it is called 'Vedanta' (because, 'anta' means the 'end'). (One purpose of elaborating the relation between a Sanskrit word and a corresponding English word is to emphasize the closeness that there is between (if I may say so) the world's worldly language and the world's spiritual language. Most of the great languages of the world, and even some small ones, like Native American tongues, seem to have been influenced by Sanskrit, as they are now with English. English is a great uniting force in the world. But this uniting is more in a worldly sense. The main thrust of this paper is to establish the great importance of Spirituality for human beings. Hence, the author submits that the world should also pay attention to its Sanskrit roots, and unite at a deeper level as well.)

This Vedanta knowledge is given out in the form of works containing conversations between a teacher and his students. The student is imagined to be sitting at the feet of the teacher; because of this the work is often referred to as 'Upanishad'. A large body of this work has been lost. However, about 108 of them are available. This includes the great Bhagvad Geeta, wherein The Supreme Divine (as Krishna) personally instructs his disciple Arjuna. The truth of the Vedanta assertions is not really linked to any religious stories. The names of many individuals and certain details of stories around them does often constitute the 'ground' in which the subtle philosophical and metaphysical ideas are put forth. However, the correctness of any and all of such ideas does not depend in any way on the truth or otherwise of any such stories in the 'ground' just mentioned. In other words, the Upanishads are, strictly speaking, spiritual books rather than religious books. One way of contradicting a religion that critics often use is to try show that some thing in one of the stories (called 'myths' by them, and 'history' by the believers) is false. Spiritual assertions do not admit of contradiction by this technique.

That brings us to the distinction between Religion and Spirituality. We shall try to explain this distinction through examples. Consider the feeling of pure love that a mother has towards her child. By 'pure', we mean that it is not contaminated by worldly feelings. Such love is comparable to spirituality. The expression of this love may then be compared to religion. So long as this expression does not get contaminated with worldliness, it may still be compared to Spirituality. Thus, in this sense, Religion can carry Spirituality in it. In other words, Religion need not be totally devoid of Spirituality. Note that Spirituality has two aspects. One relates to the feelings and the attitude that one has in his mind towards Reality, without the interjection of worldly ideas of profit and loss, greed, jealousy, and desires. This is the purest form. The other is where the mind is contaminated by worldly things. In this case, this contamination expresses itself through actions in the world. The contaminated mind and the contaminated actions may be compared to what goes around as Religion.

Having said the above, the reader must be cautioned against jumping to the conclusion that every aspect of every Religion necessarily represents or contains something bad or deplorable. We shall elaborate this later. Here, we only make a general observation, namely, that Religion is like various worldly involvements; it has its positive and negative aspects.

Coming back to the example of the mother and child, a 'pure expression' of love may include, for example, a simple play with the child, caring for the child, sacrificing one's other pleasures in order to properly care for the child, taking risks on one's own self for the present or future good of the child, and so on. However, when the mother dresses up the child so that he looks better than other children or uses the child to gain some glory in the society, or tries to pull other children down so that her own child may appear better, or emphasizes various worldly aspects of the expression of love, then such expression may be compared to the attributes of what is commonly called Religion.

One example of an activity that may be called spiritual is the activity of propagating the following message of Jesus: "It is easier for a camel to go through the eye of a needle than for a rich man to enter the kingdom of God". Why this message is spiritual, we shall discuss later. It should not be surprising that we do not hear this message from the pulpit too often. A cleric who emphasizes this too much will only thin down his flock. The reason is that by and large, people are materialistic and want comforts. But, for many people, Religion merely amounts to the materialism of both worlds. A materialistic atheist wants materialistic success only in this world, because to him the other world does not exist. The religious man believes that there is life after death, and his main interest is to ensure his comfort in the next life as well as this. Both the atheist and the believer are being materialist, the difference is that the believer wants more!

Again, a person who is trying to convert someone to his own religion so that the proselytizer may obtain a higher place in 'heaven', is practicing a religion only, because his goal is basically to obtain more comfort or higher position for himself. In general, it is important to note that the worldly aspects of religion could indeed be sinful. Indeed, Religion can be a hurdle on the path to 'God'. This fact is being more and more realized in modern society. For example, we have the book by Saranam (2005) with the title "God without Religion".

The face of Religion in the 21<sup>st</sup> century is horrific indeed. Never before, there has been so widespread killing in so many countries in the name of religion. Open insults to other religions were never so common. The more tolerant a religion is, the more temptation to denounce it, and convert its people. A nation practicing one religion is talking of annihilating another nation of a different religion. Women are being arbitrarily killed in relatively large numbers at the whim of men. And so on,

The common (religiously oriented) mass of people, in almost all religions, dwells on religious stories and rituals, arguing in favor of one story or ritual over the other, claiming superiority over the other guy, forgetting the spiritual ideals that the great fathers of his own religion had laid down. The nonbelievers, the so-called atheists, have their own religion (though this religion has no name), which fights against innocent people for worldly and political gain. People belonging to more tolerant religions or sects, deemed to be weak, are demonized so as to please the people of more aggressive

religions or sects. Even though I still believe that the meek shall inherit the earth, at the moment it seems that the meek will be wiped out or converted to ferocity.

However, as mentioned above, a large proportion of thinking people all over the world have begun to seriously question the above aspect of Religion. They have begun to realize that Spirituality is the main thing, that all religions, more or less, teach It in various ways, It being essentially the same for all religions

Thus, most of the poignant poems of the Soofies on Love of God, poems in the Psalms and in the Adi Granth of Sikhs, and the Sermon on the Mount and most of the other teachings of Jesus, the teachings of Buddha and Mahavir, the discourses in the Upanishads and the Gita, and many more from different traditions, are all eloquent examples of Spirituality. Just as pure water is pure water, independently of the source from which it is derived, similarly 'love of God' is love of God, irrespective of whether it is taught by Krishna, Jesus, Roomee, or Nanak. As Roomee stated: "The religion of the lovers of God is different from all religions. Lovers of God have no religion except God alone." In the Bhagvad Geeta, Krishna says: "Leaving all varieties of religion aside, take shelter in Me alone. I will liberate you from all sins. Do not worry."

It should be appreciated that Spirituality too has various sectors, including the elementary, the middle level, and the relatively more advanced parts. Different teachers taught at different levels and with different emphasis on the details according to the need of the disciple(s) and the overall situation at hand. The 'amount' of Spirituality in different religions, or in different texts in the same religion, or even in different parts of the same text in the same religion, is not 'equal', contrary to what is often stated. The Bible is a religious book, but most of the assertions of Jesus are spiritual. Geeta is pure spirituality, though the Mahabharata in which it is embedded is a more religious book.

As is widely acclaimed by writers both in the East and the West, the Vedanta, (particularly the Bhagvad Geeta) is a high level exposition of Spirituality. In this paper, we shall examine the nature of Reality in a new way, namely in the light of certain recent mathematical work. We shall then try to understand what Spirituality is, in the light of the same. The discussion will be interlaced with the ideas of the great philosophers and spiritual teachers. Vedanta will then be discussed in the context of the same. We end the introduction now by saying that, contrary to what the 'Vienna Circle' philosophers of the early part of the last century had presumed, there is really no 'metaphysics' in the sense that, potentially, nothing is unknowable. Furthermore, verifiability is present in Spirituality in the sense that most of spiritual knowledge has come to us through the personal experience of the great spiritual teachers from all over the world.

## 2. METAPHYSICS, SPIRITUALITY, AND SCIENCE

The word 'metaphysics' was first used by Aristotle. In a loose sense, he called the science of his time as 'physics', and what was beyond that as 'metaphysics'. Since then, slowly 'metaphysics' came to mean the conception that philosophers have of reality and the cosmos. Many people came to regard 'metaphysics' as that which is beyond the range of human experience in the sense that it cannot be perceived by our senses and its truth cannot be verified by experimentation and observation. In due course, this was perceived to mean that which is 'unknowable'. The author believes that on this point, many philosophers (like the 'logical positivists') made a fundamental error. They

believed that if something is unknowable, then there is no point wasting one's time on that; I agree with this. But, their error lies in the assumption of 'unknowability'. Whether something is knowable or not depends often upon the questioner's time and place etc. If Plato had asked how the surface of the moon looked like, at that time it would have seemed that the nature of the said surface is unknowable because no one can jump to the moon. However, later, people actually stepped on the moon, and so the answer became known.

The more accurate fact is that no one can prove that something is 'unknowable' in an absolute sense; any such proof can be made only under some assumption, but then the assumption will still remain to be proved. For example, suppose my family-less friend died leaving a collection of books. A blind man picked a hard cover book out of this collection and accidentally burnt it. There is no person who knows what books my friend had left. The question is: "What is the name of the burnt book?" It is tempting to say that the answer is not knowable because since no one is there who knows what books my friend left, the burnt book came out of an unknown lot, and so is unknowable. But, even here there are implicit assumptions. A digression would take us too far out of the main course of this paper, but the following scenario may help. A month later, a man comes and says he sold a particular hard cover book to my friend for which he has not been paid. He brings his servant whom he had sent home with my friend whom my friend could pay. My friend found no cash at home, so he sent the servant back with a promissory note. An hour later my friend died of a heart attack; the book seller did not know this and had assumed that my friend had forgotten to pay. A search of my friend's book collection shows that there are no hard cover books in it. Thus, the answer becomes known with a high probability. I said 'high probability', because it could have happened that after the servant left, a medical man came with a hard cover book and accidentally exchanged his book with that of my friend. Obviously, there can be other more complex scenarios. That is why Hume said we can never be sure about phenomena, and ended up casting a shadow on all of Science. However, Science still holds and is useful because even though we do not know phenomena at deeper levels, we know enough to be able to predict, so that our gadgets work and our scientific acts lead to the expected results.

But, why are belaboring 'metaphysics' so much. The answer is that a lot of thinkers, like the positivists, regard 'metaphysics' (which, according to them, includes Spirituality and hence Vedanta) as meaningless, largely because it is supposed to be unknowable. Of course, such philosophers are misled. One reason is that their thinking is like an attempt to catch rain in a sieve. They assume either that all of Reality can be studied by their approach, or if there is a part of Reality that cannot be studied by their approach, then that part cannot be studied at all. The author maintains that both of these assumptions are wrong. As is well known, their approach often leads them to problems in language, like the meaning of words. To explain this, we recall the example where Spirituality was compared to the pure love of a mother towards her child, uncontaminated by worldly ideas. Suppose there is a visitor from another planet, where there is no parenthood, and where (life size) living beings are produced by a god by making a model out of dirt and blowing on it. The visitor learns our language, and is trying to understand what is a "mother's love". He may get a vague idea of the same by talking to humans, but it will be quite hard for him to know what it is because he cannot experience it. Notice

that his situation would be much worse if a human mother and child visited his planet and the mother talked about 'love'.

The higher spiritual truths come to humans, only because they are conscious beings (in the sense that they are self-conscious, i.e., they are conscious of their own consciousness). The positivists and other materialist thinkers believe that knowledge can be obtained only through the five senses, and that only those phenomena of Nature are worthy of study that lend themselves to repeatable experimentation and verifiable observation. The author maintains that for a conscious being, potentially, in a sense, nothing is not-knowable, so that there is really no "metaphysics" in the usual sense. In a sense, as we shall explain later, a conscious being has a sixth sense; that will be called 'Direct Perception of Reality' (often called 'intuition' in ordinary usage). The consciousness of a conscious person is independent of time and space, and can increase or decrease. Spiritual practice would tend to increase it.

The author also maintains that through personal experience, practice, observation, and direct perception, the great spiritual teachers of the world have studied spiritual phenomena. The fact that their assertions are similar shows that there is repeatability and verifiability. Furthermore, a document such as the "Yoga Sutras" of Patanjali is almost like a scientific document, it says that if you do certain things, you will achieve certain results. The field of 'higher spirituality' has some similarities and dissimilarities with the field of 'lower spirituality', which may be called 'Science'. The similarities have been pointed just above in this paragraph. The dissimilarities are that 'higher spirituality' is more vague, more dependent on direct perception, more dependent on human subjects and quite difficult to experiment on. The reason for the just mentioned 'difficult' situation is that humans need to devote a large part of their life to this undertaking and that they need to do this with 'Faith'. By 'faith', we do not mean belief in some particular religious belief-system, but rather faith in the fact that Spirituality is meaningful and that it does work and that it will work. Thus, the human subjects actually will not be 'experimenting' in the usual sense, because they believe that their practice will work. In other words, the result of the 'experiment' is assumed to hold before the 'experiment' is done, which makes a mockery of the word 'experiment'!

The answer is that the human who undergoes the spiritual practice does not really do it as an experiment with the purpose of seeing what results the experiment will give. This person has a general and strong faith that what he is doing will 'lead him towards the Divine', the 'best' scenario being the case where he leaves it totally to the Divine to decide as to what is meant by being 'led to the Divine'.

Of course, now the bigger objection arises: On what grounds do we talk about repeatability and verifiability. The answer is that as spiritual practice is done with faith, diligence, and sincerity, certain changes occur in the practitioner. Usually, the practitioner develops new positive abilities that he did not previously have. But, the practitioner does not try to test whether any changes have occurred. Under the best scenario, he is not even conscious of them. Only some people in the public who happen to be close to him observe his gains. The practitioner himself never tries to use abilities or verify that he does have some. Such activity would hurt him and reduce his abilities, if any. In a later section, we shall discuss scientific reasons for why this is so.

As an example, recall from the Bible that Jesus often went into meditation. Once, after 40 days in meditation on a cliff, Jesus arose, and was thinking of walking down to the village. At that time, the Devil asked to him to jump down the cliff so as to reach fast (because he would not get hurt in any case, since God will protect him), but Jesus replied: "God is not to be tested." Yes, the spiritual man does not try to test if he developed abilities, and he does not try to use them to make his life more comfortable from the worldly angle; he uses them only when he is forced to do so, and always for a good purpose only. Again, a materialist might say: There is no gain from spiritual practice, since one cannot use the supposedly acquired abilities any way. The answer is that Spirituality does not admit of a materialistic loss or gain. An ounce of spiritual joy is superior to a ton of material pleasure. Thus, to the spiritual practitioner, being on the spiritual path is itself a big gain. On the other hand, it is not true that the practitioner will gain nothing from the worldly angle. As time passes, others will find that the practitioner has various nice attributes, and because of that many will be drawn towards him. Indeed, that is how the disciples (and, later on, even many people in the general public) are drawn towards spiritual teachers.

Coming back to repeatability and verifiability, we see that this happens in the spiritual field through the observation by some people in the public that a certain spiritual practitioner has some nice attributes. All over the world, in different periods of time, spiritual leaders (great and small) have risen and made their impact. This has happened repeatedly. No one can deny that. Even today, in the 21<sup>st</sup> century CE, we find that the spiritual leaders are the most revered men and women in history. Thus, the assertion that spiritual leaders do develop some positive attributes has been verified quite well. Some may say that this not quite as in Science. If we want to verify that the boiling point of pure water is 100 degrees Celsius, we can do the experiment repeatedly and verify the assertion. This is true. But, in this last case, the experiment is simple. Even in Science (the lower part of Spirituality), some experiments are quite large and involve a great deal of equipment and preparation. The higher sectors of Spirituality require decades of effort by a person with faith. We conclude by saying that the lower and the higher sectors of Spirituality have differences of many kinds, but basically they are one in that they deal with Reality.

### 3. SOME SCIENTIFIC INSIGHTS INTO REALITY

One important feature of modern scientific work is as follows. Science leads us from a group of certain known facts to a certain group of other known facts which is a bigger group. How does it lead us from a smaller group to the bigger group? It does so by using data from new experiments or investigations and applying logical and mathematical analysis to the same. This feature of science makes it very respectable and convincing. However, as discussed the earlier, direct perception also plays an important role. Through direct perception, we are led to think of new kinds of investigations or experiments which might be very insightful. Similarly, direct perception may also lead us to new and fruitful analyses of the data that we already have, and may lead us into new ideas in logic and mathematics. Indeed, it is realized more and more by even the greatest scientists that a very large part of great science is done through direct perception. In this section, we shall discuss certain important facts which have a great bearing on our

investigations into the nature of Reality. For convenience, different topics will be discussed in different subsections. For lack of the space, this discussion is more like a summary of the ideas. For further details, the reader is encouraged to look into the other papers of the author referenced at the end.

### 3.1 Philosophical implications of the Goedel's theorem

Consider any system which involves the natural numbers  $0, 1, 2, \dots$ . Suppose that this system is based on a set of axioms. In layman's language, the theorem says that there exists a question pertaining to the system which cannot be answered by using the axioms of the system. To answer such a question, we can add an axiom to the system (such that the new axiom is consistent with the axioms that the system already has); now, the said question would be answered. However, we shall now have a new system based on the new (expanded) set of axioms, to which Goedel's theorem will again apply. Now, there will be a new question which cannot be answered by using the axioms of the (new) system. And so on.

This theorem has far reaching philosophical implications, some of which we shall discuss in the sequel.

### 3.2 Subjectivity

There is a law known as the 'Law of subjectivity in scientific experimentation'. Basically, this law states that the results of any scientific experiment or investigation are confounded with the place and the time where the experiment was done. By confounded, we mean mixed up in an inextricable manner. For example, suppose I bought some apples and some oranges, and I paid a total price of \$10. Suppose nobody kept any record. In this case, the total cost of apples is confounded with the total cost of the oranges. The law states that we cannot determine what effect the time and place of the experiment had on the data collected from the experiment. Because the time and place are subjective, the law states that there is inherent subjectivity present in all experimentation, and that it cannot be avoided.

Because of Goedel's theorem, it can be shown that the exploration of Reality can never be exhausted; indeed, whatever exploration may have finished by any time stands in relation to the unexplored sector of Reality as zero does to infinity. Also, while exploring, we do not really know all the details about which sector of Reality we are in; thus the law of subjectivity is extremely important in the exploration of higher Reality.

### 3.3 Dealing with Infinity

One reason why Goedel's theorem holds is that it involves 'infinity'. Here, we wish to caution the reader to be careful when dealing with infinity. The point is that Reality involves infinity in infinite number of ways, almost at every step. When we deal with infinity, even the ordinary ideas such as the concept of being bigger or smaller, or even the concept of adding up numbers in whatever order one likes, may become faulty and lead to error.

For example, consider the infinite sum:

$$Q=1-(1/2)+(1/3)-(1/4)+(1/5)-(1/6)+\dots+(1/1001)-(1/1002)+\dots$$

Notice that in this sum, the odd terms have a positive sign, and the even terms have a negative sign. The question is: ‘What is the value of Q?’ In other words, we wish to sum up all these numbers so that each term is summed (using its appropriate sign) and no term is left out. Now, ordinarily, if we have a sum of a finite number of terms, it would not matter in what order we do the summing. Thus, the expression  $[3-2-5+4+1-8-9+5+3]$  equals  $(-8)$  irrespective of how we do the summing, i.e, whether we take it the way it is or rearrange it as, for example,  $[-2-5-8-9+3+5+1+3+4]$  or  $[-9-8-5+5+4+3+3-2+1]$ . But, this is not so with Q. The value of Q can be made to equal any number we want (for example,  $(-8)$ , or  $(8)$ , or  $\sqrt{(203)}$ , or  $\{-1/\sqrt{(203)}\}$ , or any other positive or negative number.

Same is the case with ‘bigger’, ‘smaller’, or ‘equal to’. Consider two sets A and B. A fair definition of being ‘equal’ is this. We shall say that A and B are equal (i.e., have an equal number of elements) if we can pair the elements of A and B in such a way that to every element of A corresponds one and only one element of B, and vice versa. Thus, if the elements of A and B are called boys and girls, then each boy has exactly one girl and each girl has exactly one boy, and no boy or girl is left out without a partner.

When A and B have an infinite number of elements, this may lead to a situation where A is equal to, or bigger, or smaller than B, depending upon how the sets are looked at. For example, suppose A, B, and C are three rectangles respectively of size  $4 \times 12$ ,  $2 \times 6$ , and  $1 \times 3$  units, then in daily usage A will be four times bigger in area than B, which would be four times bigger than C. But, the points of A and C can be paired one to one, so A becomes (in a sense) equal to C (and hence smaller than B), and so on.

One reason for talking about the above is that, often, in their frenzy to convert others, religious people (while glorifying their ‘God’ or Teacher, and decrying the ‘god’ or teacher of another sect or religion) claim that everything of theirs is bigger, greater, and so on. Such talk is childish. Such religionists have created ‘God’ in their own image. The Divine is not like a tribal chief. Marvelous, and worthy of the deepest respect, is the statement of the Vedantic sage, who (in the Isha Upanishad) said; “Om poornam adah poornam idam poornaat` poornam ud`achyat`ay// poornasya poornamad`aaya poornam eva avashishyat`ay”. (The Divine is Complete here, Complete there, and from the Complete only the Complete emerges. If from the Complete, the Complete is taken out, the remainder will still be Complete.”). The author has come to this conclusion (concerning the Divine) mathematically (Srivastava (2003)), but that was achieved by standing on the shoulders of hosts of sages and thinkers. The above assertion of the Vedantic sage is marvelous because he went that far in pure Spirituality entirely through his spiritual practice.

### 3.4 Context-ism

Let p be a proposition whose truth we wish to explore. Imagine that p is written in words. Now, before we can explore p, we need to understand the meaning of the words that are used to define p. In order for us to define the meaning of all the words used in p, we need to explain the whole context in which p arises, and do so at least to an acceptable degree. Unless the context is made very clear, there is no hope of answering whether p is true. Thus, it is necessary that we explain the context as accurately as possible. On the other hand, it is also clear that the more clearly the context is defined, the narrower will

be the sector of Reality to which it will apply. 'Context-ism' says that the context in which the truth of a proposition can be explored is of utmost importance.

Note that 'context-ism' is close to, but somewhat different from, the philosophical notions of 'Contextual-ism', 'Foundational-ism', and 'Coherent-ism'. 'Context-ism' merely asserts that the proposition  $p$  can be explored only conditionally, the 'context' serving as the condition. If the context is changed, the answers concerning  $p$  may change. If the context turns out to be self-contradictory or meaningless,  $p$  cannot be explored.

This brings us to a more profound principle. Notice that the 'context' can also be looked upon as a 'perspective' under which questions concerning  $p$  are being explored. Unless the perspective is made clear, exploration is not possible. In order to explore Reality, we need to ask as to which sector of Reality do we stand in. Thus, Reality can be logically explored only through a perspective. Recall that in the beginning of this section, it was pointed out that Science leads from a set of facts to a bigger set of facts through a logical path which uses data from experiments or investigations. This logical path, which is the biggest strength of Science is also its great weakness. How? The reason is that walking on this logical path amounts to asking questions logically, which in turn requires that the perspective be very clear all along the path we take. This last requirement creates difficulties.

Consider a mountainous territory. Suppose that the hills, valleys, and the peaks are all very rugged. Also suppose that normally the whole area is covered with various layers of fog of different densities. On rare occasions, in small areas, the fog reduces. We are on one cliff, and we wish to go to another better cliff. For this purpose, we need a well-defined path on which we can travel. The exploration of Reality through Science is similar to this. In the areas where the fog is very thick, a careful delineation of the path is an absolute necessity, howsoever hard or slow this work might be. That is the nature of the scientific way. But the clearing of the fog, or direct perception, has its own great merit, and is often responsible for the development of major understanding of Nature. 'Direct perception' corresponds to the situation where the fog reduces, and we begin to see the general topography of a sector of the whole place. The spiritual practice causes an increase in direct perception, because it tends to expand our 'consciousness' (a topic that we shall discuss in detail in the next section).

Above, it was stated that for lower spirituality (i.e., science), in order to expand from a smaller to a bigger set of facts, we need to find a logical pathway sustained by logical analysis of data from properly conducted experiments and investigations. We also remarked that this is both a great strength and a great weakness of the scientific method (if we exclude 'direct perception' from it). The strength lies in the fact that one feels secure that the path is on reasonably solid ground which can be treaded on. The weakness is that the process is slow because it is not clear as to which direction the path should go. 'Direct Perception' gives a glimpse of some sector of the terrain, though the view may be distorted to various extents due to the fog. Here, the strength is that some idea of the terrain is obtained. The weakness is that the idea may not be very clear and we still need to determine how to connect to the supposed terrain. In any case, the two together (the logical path, and the direct perception) are our principal tools of exploring Reality.

The logical path suffers from the limitation imposed by Goedel's theorem and the need for clarifying the context. A closer look at the implication of Goedel's theorem shows that Science can not fathom Reality except to an insignificant extent. 'Direct

Perception' takes us further along by leaps and bounds and seems The Way by which Reality becomes known, but the glimpses obtained through it shall still have to be clarified by logical analysis. Spirituality enhances both the ability of direct perception and of logical analysis.

I do not believe that star-wars type of preparation (equipping ourselves with space ships and missiles, like in electronic games we give our children to play) will help much in space exploration. I think that the principal gradation of beings in Nature is on the basis of consciousness. Higher beings have much more consciousness than us, and they can create objects or make events occur simply by creating a strong will in their 'mind'. But, they use such (creative) abilities only when necessary.

#### 4. THE NEW THEORY OF REALITY

At the outset, it is important to point out that there is a theory of Quantum Reality due to Bohr and others which denies the existence of any deep Reality. (Currently, this is the most prevalent theory in the Physics workplace. However, it is not that most people are enthusiastically supportive, but they have apathy because they think it does not matter how things are at the more fundamental levels so long as the mathematics gives the correct answers.) This theory has been modified or contradicted by theories due to Wheeler, Bohm, Everett, Finkelstein, Einstein, von Neumann, and Heisenberg, each of whom is joined by supporters (See, for example, Herbert(1985).). Bohr does not deny the ordinary Reality, but does not tell where lies the boundary between the ordinary Reality and the (nonexistent) deep Reality.

The nature of Reality has been of interest to a large number of thinkers, philosophers, scientists, and spiritual leaders of the world. However, thus far, most of the theories have been rather compartmentalized. Science is supposed to deal with the physical objects. Metaphysics is separate, and is considered meaningless by some. As we have argued before, there is really no metaphysics in the real sense. The author has developed a theory which covers both the so-called physics and metaphysics. Various aspects of this theory have been argued in many published papers which are referenced at the end. In this section, we shall summarize the same briefly.

The said theory is denoted by TK (where K stands for the Knower, the Knowledge, and the (object to be) Known). This theory has two basic axioms: A1 and A2. Axiom A1 says that Nature consists of logical-mathematical objects only. (We use the word Nature essentially as a synonym of Reality, the only slight difference is that we use the former often to refer more to the physical world.) Also, we would like to emphasize that in a deeper sense, mathematics deals with the study of 'structures'. So what we're saying is that all physical objects (and, indeed, all objects in Nature) are basically structures, and so are all phenomena involving them.

The question arises as to how the physical world exists, because mathematical objects exist essentially in the realm of ideas. Axiom A2 deals with this. It says that inside Nature, there are two kinds of objects: Inanimate and Animate. The animate objects (or 'entities', as we shall call them) do have consciousness, and the inanimate objects do not have consciousness. The consciousness of an animate entity depends upon its physical and psychic body. The consciousness of an animate entity gives to the entity the experience of the existence of physical objects; it converts certain logical

mathematical objects in Nature to objects that appear to be physical to this animate entity. Furthermore, certain mathematical relations that exist between certain logical-mathematical objects in Nature are converted by the consciousness of the animate entity into the experience of a phenomenon in Nature. Notice that the consciousness of any given animate entity has a certain range; it does not bring all of Nature under the purview of the animate entity. Thus, the consciousness of a given animate entity reveals only some of the logical-mathematical structures inside Nature and only some of the relationships between these.

The consciousness possessed by different animate entities may differ from one entity to another, both in the extent to which it covers Nature and the quality of the physical experience it gives.

We illustrate with some examples. Let us consider 'color'; the logical mathematical structure that this corresponds to is that of the sine wave which may be represented by the equation " $y=a \sin (bx+c)$ ", where a, b, c are some numbers called parameters, y represents the amplitude (height) of the wave, and x denotes time. The parameters control the amplitude, the frequency, and the phase of the wave. For some values of the parameters, the equation represents a wave which is experienced by the consciousness of a humans being as the color 'green'. However, the same mathematical structure (i.e., with the same values of the parameters) is experienced as the color gray by a lion, because consciousness is dependent on the physical and the psychic body of the animate entity. Again, as mentioned earlier, the consciousness of animate beings varies from one to the other; thus, what is experienced as the color 'green' by a human may be experienced as a sound of some kind by another human. Similarly, for some other values of the parameters, the mathematical structure of the sine wave may be experienced as a shrill sound by a certain insect, but may not be experienced at all by a human. This shows that, in this respect, the consciousness of a humans being has less coverage of Nature than that of the insect. Another example of less coverage by a human relative to an animal is the situation where the presence of a molecule in the air (of the blood of a murdered person) may be detected by the consciousness of a dog but not that of a human. Thus, the assertion by some religions that the consciousness of humans is more than that of animals in all respects is not correct.

Axiom A1 of TK directly impinges on the situation in Quantum Reality. In Srivastava (2004-5), TK is compared and contrasted with the eight theories mentioned earlier, and is shown to be more appealing than each one of them. Because it has a different paradigm, it tends to unify the earlier theories to some extent in a certain sense. We shall not go into details here because of lack of space. However, it agrees with Einstein that Quantum Mechanics is incomplete, and like Wheeler and von Neumann it says that consciousness does play a role in quantum reality. It agrees with Bohm that we should look at the Whole (which is not just a sum of its parts), and also with Heisenberg that potentially states are important. TK agrees with Bohr that particles at the quantum level do not have dynamic attributes, though it arrives at this point because of the different paradigm. In particular, it shows that there does exist a deep Reality, supporting Einstein.

We now consider consciousness. Recall that, according to axiom A1, all objects in Nature are logical mathematical structures. Thus, while many of these structures are inanimate objects, some of them develop consciousness and become animate. The

question as to what causes a structure to become animate was explored in Srivastava(2003). Let S be a logical mathematical system, and let A and B be subsystems inside S. Suppose that A is a well defined object inside S in the sense that the identity of A is not irremovably tied to anything else. Similarly, suppose that B is also a well-defined object in S. Assume further that A and B are defined in the same logical plane so that they are able to interact with each other. Then, A and B are said to be ‘cognizant’ of each other. Also, A is said to be ‘conscious’ of B if A is cognizant of the statement “A is cognizant of B”.

Let V be a set with the following property. Given any set C in Nature, V is a subset of C, but V has no element of C. In other words, V is a subset of the empty set of C. This is true of V in relation to all possible sets in Nature. The set V will be called the ‘Totally Empty Set’ or the “Void”. Although Void, the set V is present everywhere in the sense that it is a member of every set. Thus, V may be called ‘omnipresent’. Following a remark of Goedel, it can be said that all of Mathematics and hence all structures (or, rather, all objects) in Nature flow out of V. Hence, ‘V creates everything’. It has been heuristically shown that if g is a well defined object in Nature, then V is conscious of g. Thus, V is ‘omniscient’. And so on. We say that V corresponds to The Divine’. It has been shown that The Divine is totally unconditioned, and (in accordance with BG 13.12 (Bhagvad Geetaa, chapter 13, line 12)) can not be said to be existent or non-existent, true or false, real or unreal. It is also shown that V satisfies the statement from Isha Upanishad (quoted in sec. 3.3). Moreover, many other assertions of the Geetaa are also vindicated. For details, the reader should look into the series of papers “Life Comes from Life” (which includes the two papers mentioned in this section), referred to at the end.

We now offer further insight into consciousness as explained by TK. Imagine our physical universe, and consider a container inside that (like a jar, or a tank). Now, there is the concept of ‘space’ (or ‘emptiness’) in our physical universe. The jar encloses some space, and so does the tank. Consider the jar; if we put some stones inside it, the space inside it shall decrease, because part of the space is taken up by the stones. If some stones that are inside the jar are taken out, the jar shall have more space inside it. Also, the walls of the jar constitute the boundary of the jar. As the walls disappear, the jar has no walls and thus may be said to enclose the whole space in it.

Now, under the TK paradigm, Nature consists of logical- mathematical objects only. Consider an animate entity, denoted by E. We may regard E as a tank inside Nature, whose walls are constituted by the ego or individuality of E. Then, the consciousness of E may be compared to the space inside the tank. (In other words, under TK, ‘consciousness’ plays the same role in a logical-mathematical world, as ‘space’ does in a physical world.) Let us consider E as a human being. Then, the desires, the aversions, and the attachments that E may have towards various objects in nature act as the stones inside the tank. As these stones are removed, the consciousness of E increases. The stones (denoted by W) constitute the psychic body of E, and the quality and the magnitude of the consciousness of E depends partly upon the stones.

That which characterizes the physical definition of E inside Nature is called the ‘physical body’ of E, and is denoted by X. It has been shown that E has consciousness because it is intrinsically connected with V. It is also shown that the existence of X is caused by W, and that W transcends X. In mathematical language, we write “ $E = E(V, W, X)$ ”, which means that E is built of three things: V, W, and X. As W becomes more

and more empty, i.e., as the ego or the individuality of E melts away, E gets closer and closer to V.

The theory TK supports in a profound manner some of the basic tenets of Vedanta. Firstly, the totally unconditioned nature of The Divine is fully supported. The psychic body W is influenced by the consciousness of the entity. It survives the physical body X. If, when X dies, the psychic body contains desires, then W attaches itself to an appropriate new physical body X\* which (it believes) shall help in the fulfillment of the desires. This may be called 'reincarnation'. Mathematically, what reincarnates is the pair (V, W).

This brings us to the so-called 'difference' between Vedanta and Buddhism. The Buddhist view is that reincarnation occurs, but it is because of W only. It is like comparing the body X to a candle. When the candle X is extinguished, another candle (say, X\*) gets lighted, and the agent that does the lighting is W. In other words, V is denied. I believe that the basic idea that some Buddhists emphasize is subsumed in BG13.12. To see this, we have a second look at V, which is the Void. Does V exist? From sec. 3.4, recall that Reality can be approached only through a perspective. Consider two separate perspectives, namely, the theistic and the atheistic ones. Under the former (which is the basis of the Western religions, and of Sikhism, and also most of Hinduism), V does exist. The argument in favor of this is as follows. When V was introduced, we clearly explained what V is in an understandable manner. If V does not exist, then what are we talking about? The fact that we are talking about V shows that V is something. True, we do not know everything about V in the sense that we cannot make a list (even conceptually) of all the sets of which it is a member. But, we do know that it is the set that is totally empty.

The atheistic argument (espoused by Buddhism, Jainism, and some parts of Hinduism) says that V does not exist in the sense that it has nothing in it and so it could not be anywhere, which means that it does not exist. Since there is no V, there is no Divine, and no soul.

In BG13.12, Krishna combines the two perspectives, which gives a broader picture. But, even this is a perspective.

Each perspective gives a picture of Reality and a corresponding line of thought, as Krishna confirms in BG4.11: "According as one approaches Me, I reciprocate."

The two perspectives outlined above are like the two sides of a coin. The time has come that religious differences be deemphasized and the bigger picture be understood. Reality cannot be circumscribed by anything or any concept whatsoever.

Notice that our contention that reincarnation occurs, does contradict the western religions even though there are some counter examples. Thus, Jesus did talk about Elijah appearing again on earth as a different person. The question is: "How did I conclude that consciousness transcends the body?" We cannot go into the details of my heuristic proof. But, the germ of the idea is this. 'Consciousness' has the feature of 'self-reference'. I am conscious of the fact that I am conscious. Using this in a somewhat Goedelian spirit, it was shown that (under Axiom A1) consciousness arises out of the empty sets inside logical-mathematical systems. This connects it with V. Since V is independent of time and space, consciousness must transcend these and thus transcend X as well.

What about Darwin, whose theory contradicts the western religions? In Hinduism, Vishnu is supposed to reincarnate to help the inhabitants of the earth. It is intriguing that

before his human incarnations, he reincarnated in the following order: fish, turtle, bore, and man-lion. According to TK, a living entity may be compared to a TV set. Suppose, the CNN news is coming on my TV at home. It is a result of two things. The first is that I do have a TV set. The second is that an electromagnetic wave is being produced by the CNN people, which is being 'caught' by my TV set. For an animate being, the consciousness corresponds to the electromagnetic wave, and the physical body to the TV set. The TV set does not produce the electromagnetic wave. Similarly, the physical body of an animate being does not produce consciousness. Now, Darwin's theory is how bodies of animate beings evolved on the earth. This is not at all in conflict with TK. The assumption that the body produces consciousness, will contradict TK, but that would be a wrong assumption that was not made by Darwin and is not a part of Darwin's theory.

What about intelligent design? The theory TK nicely explains the positive features of this. All of Nature consists of logical-mathematical objects alone, and the natural phenomena (studied by Science) are nothing but the interactions between these mathematical structures with each other according to the rules of mathematics. Now, mathematics is perhaps the most intelligent activity (next to spirituality). Because of their mathematical nature, the phenomena occur with precision, and the whole thing looks very intelligent. However, the negative aspect, namely, that there is a person sitting somewhere who makes intelligent decisions and runs everything properly is not supported by TK, unless we simply say that the 'running' of Nature as Mathematics is the design of The Divine.

## 5. VEDANTA WITH THE SCIENTIFIC INSIGHTS

We now discuss Vedanta in a more focused manner in the light of the scientific and philosophical machinery developed so far. The first question that arises is: "What is Vedanta?" As is stated earlier, Vedanta is a high-level exploration of the nature of Reality. However, there are differences in interpretation between authors, and even for the same author, one may find inconsistencies of expression. This is as should be expected in a field as abstract and as advanced as this. Furthermore, the author sees this also from a slightly different angle. Now that it is clear that Nature consists of logical-mathematical objects, it follows that all experience is an experience of such objects alone. We had noted earlier that even for a sine wave, there can be quite different experiences created by the consciousness of different animate entities. Thus, the problem that the sages experience with higher Reality is that some abstruse structure is being brought into the realm of consciousness. These experiences may come not only through the senses but also through direct perception. However, it is not necessary that there be appropriate words to describe the said experience. Such words could be developed only if there were a relatively large number of people who could legitimately conclude that they have the same experience, and who could then decide to develop terminology for the expression of the same.

Among Indian Scriptures, I do find on a comparative basis that, relatively speaking, in the Bhagvad Geetaa the words seem to be used with extreme precision. Thus, for my own purposes, where there is confusion, I go by what the Bhagvad Geetaa seems to say.

Notice that under TK, the problem of ‘mind-body duality’ which has been debated by many philosophers and scholars in the West, is completely solved. Indeed, there is no mind-body duality. The reason is that, under TK, both the mind and the body exist in the logical-mathematical world, and are logical-mathematical structures. Any two such structures, if they are cognizant of each other (i.e., if they are defined in the same logical plane), can interact with each other under the rules of ordinary mathematics that defines the said logical plane. Since both the mind and the body are such logical-mathematical objects, they interact with each other in the manner just described. In other words, under TK, there is no separate world of the mind and a separate physical world in which the body lives. Both of them are in the realm of ideas. However, it would be wrong to call TK merely as “Idealism”. A better description of TK would be "Mathematical Structuralism". Some of the concepts included under idealism were there from the times of Parmenides, Socrates, Plato, etc, down to Berkeley and others. However, when we look into the details, we find that the forms that they considered were something quite different. In any case, their ideas were only on the philosophical plane, and thus could not be used to make scientific progress. However, under TK, the situation is laid out clearly enough that scientific activity can be undertaken. In particular, since TK applies to Vedanta, scientific work can now be undertaken under the guidelines of Vedanta.

The theory TK does not support the magistrate concept of God, which is advocated by certain religions. This concept says that God creates souls, who are born on the planet earth as humans under different circumstances. On the day of judgment, depending upon how they acted in this one life, God sends them eternally either to heaven or to hell. If this God is all-knowing, then he ought to know that many of the souls which he is making will end up eternally in hell. Thus, this God is either not all-knowing or he has a cruel sport. Under TK, each act of an animate entity is a manipulation of Nature, and the various mathematical systems react with it under the rules of mathematics which are impartial. That upholds BG 5.15: {The Lord does not take into account any one’s sins, or even the so-called good deeds. Knowledge is enveloped by ignorance, and the living beings are misled by that.} The theory TK supports the last sentence. The consciousness of any given animate being is limited both in respect to the portion of Nature that he can see through his senses and in respect to the logical analysis of the same that he can do. Everyone takes the optimal path all the time, but only under his own limited perspective and using his own limited power of analysis. He is surrounded by ignorance. Because of his limited vision and ability, he does not see the broader perspective, and is thus misled into error.

We now come to Maya. This is a widely used word with several connotations. People have often translated this into English language by the word ‘illusion’. However, in Sanskrit it actually means something between reality and illusion. When it is thought of as illusion, it is sometimes compared to a woman who is a temptress. Of course, this is unfair to the fair sex. Men do as much tempting as women, perhaps more. Under TK, the common Sanskrit meaning is upheld. In other words, it should be called both reality and illusion. We explain this below.

As we stated earlier, under TK, Nature consists of logical-mathematical systems alone. However, the consciousness of an animate entity does not reveal the actual mathematical structure, but it gives the experience of a physical object or a physical

phenomenon. To the extent that the physical object or the phenomenon is not exactly the same as the mathematical structure, the animate entity perceives an illusion. On the other hand, whatever the animate entity does perceive under the consciousness that it possesses, must be considered reality as far as that entity is concerned. In other words, the entity must act as if whatever it is observing is a reality. On the other hand, spirituality would demand that the entity should look beyond the superficial experience of Nature that it is having and try to go to deeper levels. To a certain extent, science does this. For example, the humans have the experience of the color 'green', but the scientists did figure out that there is a mathematical sine wave behind it.

Many assertions concerning Maya are in vogue. Sometimes, they contradict other assertions that are also in vogue. This happens often because different people use the same words with different connotations in mind. Of course, TK cannot justify all of these simultaneously. Also, we cannot discuss these here in the sense that we cannot recall sentences from different books and argue in favor of one against the other. We shall therefore only make some comments here, and the interested reader can use them to analyze seemingly contradictory statements elsewhere. The author believes that some of the confusion arises because people try to ascribe something like a human personality or attribute to various aspects of Reality. For example, it is said that Maya is the power of 'Brahman' (which, in some places, is described as 'pure consciousness', being without form, attribute or action). But, if Maya is the power of Brahman, then Brahman is being given an attribute, like a king having a maidservant. It is also said that Maya conceals Reality and projects Reality as something else. Here, again, we are ascribing a personality. This is as if there is a person who has the intention of concealing and projecting something as something different. According to TK, it would be better if such ascribing of personality is avoided. I have read it stated that Maya "exists, does not exist, and both exists and does not exist" Such a statement can be supported by interpreting TK in a certain way. It can also be contradicted by interpreting TK in a certain way. Arguing about such things is like arguing about religious stories; it does not give any insight into Reality.

We now come to the question of Free Will. Even from Vedic scholars, I have heard very different opinions. Most people believe that Free Will is there, because they can raise their hand when they want and walk or sit when they want, and so on. But, others think that free will would occur in a situation where your decision to do something cannot be stopped by anyone. I can raise my hand or walk or sit only as long as a stronger person does not force me to do otherwise. Suppose I program a machine to take a decision on something by doing some long computations. The result would be that the machine will take a relatively long time in deciding. A simple person may think that the machine is very 'thoughtful'. But, actually, I am the one who took the decision, except that I decided to arrive at it in a very complicated way.

So, do humans have a free will? Under TK, the answer is 'yes', but 'only potentially'. What this means is that in day to day life, humans do not have a free will. It can be shown that there is only one will in Reality: The Will of The Divine. However, animate entities such as humans can reduce their W (recall section 4), and as they do so, their will begins to overlap with that of the Divine. In such a situation, their will can materialize. This is what happens when sages perform the so-called 'miracles'. Actually, there are no miracles. There are only super-normal events. Also, the situation concerning

free will is simpler than what seems to be from the remark just made. The more precise statement is this. When the will of an animate entity does not contradict any other desire that this entity has, then the will of this entity becomes the Divine Will. People have experienced that sometimes their prayers do get answered; this happens because of the reason just given.

We conclude the paper by touching on a very different aspect of Vedanta. It is well known that many meditation experts in the Vedic tradition use certain complex but highly symmetric geometrical figures on which they mentally concentrate. These are called 'yantra' in Sanskrit, which is commonly supposed to mean 'machine'. But, these are not 'machines' in the physical sense. Like in other aspects of Vedanta, the theory TK supports and is supported by this as well, namely, the 'yantra'. I believe that, in hitherto unknown ways, these figures or 'yantras' connect the meditator with certain aspects of Reality. Since, as TK maintains, Nature consists of mathematical objects alone, it is not surprising that some practitioners discovered that symmetrical mathematical figures lead to insights into Reality. 'Symmetry' is not a new thing in Physics, it is deeply embedded into the properties of objects. Wigner got a Nobel Prize on that. But, the 'yantra' may turn out to be much deeper than all this.

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