**Article**

# Concepts in Vedanta Applicable to Scientific Explanation of Consciousness

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ABSTRACT

Consciousness and its relation to the physical body were thoroughly analyzed in the Indian philosophy (Vedanta) of ancient times. This philosophy contains many concepts which can lead to scientific answers to some of the questions that brain scientists and modern consciousness researchers are concerned with. In Indian philosophical literature thought is often described as being very fast and one that never comes to stop. Properties of thought described in this literature are very similar to those of faster-than-light objects, known as tachyons in modern physics. It will be possible to describe mental processes and interaction of mind with ordinary matter, in the terminology of mathematics and physics and quantum mechanics in particular, by means of a theory based on this philosophy's concept that mind consists of superluminal objects.

**Key Words:** consciousness, mind, matter, Indian philosophy, Vedanta, monism, mind body dualism.

## 1. Introduction

Consciousness and its relation to the physical body were thoroughly analyzed in the Indian philosophy of ancient times. This philosophy contains many concepts which can lead to scientific answers to some of the questions that brain scientists and modern consciousness researchers are concerned with. In particular, we will discuss this philosophy's proposition that mind is faster than matter (hence faster than energy and light) and how this proposition sheds light on questions such as "is monism or dualism, which theory can better explain consciousness scientifically", "is dualism necessarily unscientific?", "How does a living brain create subjective experience?", "is quantum mechanics necessary to explain consciousness in a brain?". In Indian philosophical literature thought is often described as being very fast and one that never comes to stop (interestingly, according to today's physics, a faster-than-light object, known as tachyon, cannot be brought to rest). If mind indeed consists of superluminal objects then it may be possible to describe its properties and processes and its interaction with ordinary matter in the terminology of mathematics and physics and quantum mechanics in particular.

We will use the brain-computer analogy to present some ideas from the ancient Indian Philosophy which helps modern researchers to find scientific explanation of how the physical brain and the mind work together and how subjective experience occurs in the brain. Indian Philosophy is often considered to be a mystery and incomprehensible probably because it was all

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written long time ago and in Sanskrit, a language not spoken today and also because consciousness is discussed here in the context of spiritual progress. Contrary to such myths this literature's analyses are objective and concerned with understanding reality and perception of reality rather than with faith and what one should believe in. Indeed, some quantum physicists think that this ancient knowledge includes concepts which resonate with findings in quantum physics (Moore 1994).

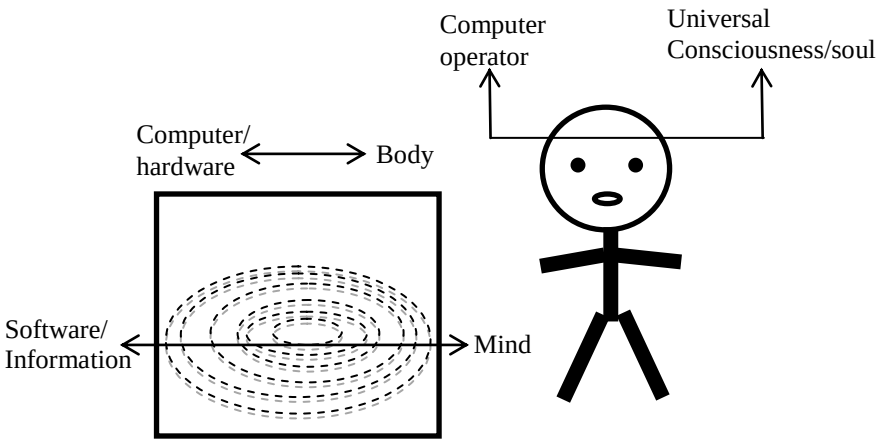
## 2. Consciousness, Free Will, Mind, and Matter in Vedanta

This philosophy makes a distinction between free will and all other aspects of what we call consciousness of humans and other living beings in modern terminology. All aspects other than free will, such as desires, logical thought, remembering, emotions, experiences, imagination and so on, are all seen as involving a certain memory, and can be amenable to scientific explanation but not free will. Briefly, this philosophy's view of consciousness is as follows:

The physical body of a living being is like a piece of hardware. It is made up of matter. Every living being, human or animal, or any living organism (possibly excluding some primitive forms of life), has an accumulation of experiences and therefore an accumulation of information, in other words a memory (called *Manas* in this literature), which we will call mind in this paper. In this sense, mind is like a computer memory containing data and programs. Just like a computer's hardware and software do not know what they are doing, their own existence, and the meaning of their memory contents, both the body and the mind of a living being also do not really know anything but there is a certain Consciousness (apart from the mind mentioned above) that "knows". Consciousness is like the computer operator, as it were, and the one who "really knows" everything that is part of the living being's activity. Although a computer does not really know or understand anything it does, once it is equipped with stored information (both data and programs) and mechanisms to store, retrieve, and process information, it is able to exhibit or simulate many "intelligent" behaviors such as learning, planning, and pattern recognition. Machines which do not have these memory mechanisms cannot exhibit such "intelligent" behaviors. Hence machine intelligence is based on memory mechanisms and we may say that an artificially intelligent machine is "intelligent" but not "conscious", where by "intelligent" we mean the ability to store, retrieve, and process information. On the other hand, human beings (and probably other living beings) are not only "intelligent" like the "intelligent machines" in the sense that they perform various functions in life using the physical brain (similar to hardware) and the information stored in the brain (similar to software) but they are "conscious" as well; they know what they are doing at least when awake. Indian philosophy emphasizes that there is "Consciousness" same as FREE WİLL, different from and independent of any living being's memory and its contents and mechanisms. Moreover, intelligence in living beings, unlike in computers, is not merely a material process but is a process of interaction between ordinary matter of the physical body and some stored information made up of faster-than-light matter. A living being's experiences and emotions are responses of this faster-than-light software to the sensory inputs. The difference between a living being and a lifeless stone is that the living being has the necessary faster-than-light information to create experience whereas neither the stone nor the computer have it. The stone's inability to create experience is perceived by us as lack of self-awareness. The philosophy makes a distinction between "information" and "Consciousness"; the

former produces experience in response to external inputs just like a computer's software while "Consciousness" is the ability to "really know" and "choose".

The mind and the body are both insentient just like the hardware and software of a computer. Only Consciousness and soul really know and have control over all that happens in an individual's life. Mind is subtle and its magic is visible only when it is working with the body similar to the way the capabilities of software (also subtle) are visible only when it is loaded into the computer and activated.




Consciousness, Mind, Body Relations in Vedanta – Computer Analogy

As already said, what we call consciousness in modern terminology is divided into two components: one is free will and the other is mind, that produces the "intelligence" explained above. Free will is independent of all causes; it is the ability to decide consciously and independent of any reason from the past or present, and without expecting anything in the future. Manifestation of free will is not an unconscious nondeterministic random occurrence. Free will is independent of space and time; its existence does not depend upon any memory, and it is not bound by any rules or logic. It is said to be *nishkarana* meaning that it is not the effect of any cause. (After all, it is free; it would not be free if it depends upon anything else for anything!) Therefore its existence cannot be described nor its occurrence be predicted by means of a formula expressed in terms of space and time using some language such as physics, mathematics, quantum mechanics, or computer science or any other science! (Note that every language consists of a certain set of symbols and rules to manipulate those symbols). Existence of such free will needs to be taken as a postulate in any theory that tries to explain subjective experience.

One may say that the above approach to consciousness is similar to the first type of approach that Chalmers (1996) criticizes as one that altogether avoids his "hard problem" [1] by assuming that free will is outside the domain of science. However, to insist that everything we experience must have scientific explanation involves assuming the opposite, namely, that nothing exists beyond

[1] Why should physical processing in the brain give rise to conscious subjective experience which is not accessible to anyone else or any other physical device outside the brain? Finding the answer to this question is called the "hard problem" by Chalmers (1996).

space and time; in my opinion, the opposite assumption is just as valid or as invalid as the former assumption that something does exist independent of space and time. In spite of asserting that free will is independent of space and time and not bound by logic, Vedanta can contribute to scientific knowledge of how experience occurs in our brains and we will try to describe this contribution in what follows. The mind, excluding free will is sometimes called *Manas*. *Manas* keeps accumulating more and more contents as life goes on. *Manas* is a sense like other senses: sight, touch, hearing, smell and taste; it is the sense of memory and logic. *Manas* is said to be *sukshma* meaning subtle (like "soft" in the word software) as opposed to the physical body which is *sthula* (like hardware) meaning perceivable directly by physical senses of seeing, touching, hearing, smelling and tasting or indirectly by physical means. *Manas* is different from the body in that neither of the two can be transformed into the other unlike for example, matter and energy which do transform into each other in specific situations. In this literature, Ishavasya Upanishad for example, mind is often described as being faster than matter hence faster than energy, that is, light (Raghavendra, 2000; p 29) and that mind never comes to rest (Mukherjee 2002). Hence the assertion that the body and the mind cannot be transformed into each other is valid according to the theory of relativity. But it is possible for the body and the mind to interact with each other producing more mind and changes in the body. Interestingly, after failures of experiments to create tachyons in bubble chambers, Feinberg (1970) conjectured that tachyons probably cannot be produced from matter but that it is possible that tachyons do interact with matter; thus his view is consistent with the above view of mind and matter although he never associated tachyons with mind.

If mind indeed consists of faster-than-light objects, then it is possible to describe its properties and processes in the terminology of mathematics and physics and quantum mechanics in particular. It may be possible subsequently, even to verify the theory using biological experiments. Using Bohmian Mechanics, in an earlier paper (Hari 2008), it is shown that a zero energy tachyon can do what an Eccles's psychon would do, that is, trigger exocytosis simultaneously across a whole dendritic tree by interacting with vesicles in multiple boutons and "collapsing" their two-state quantum wave functions into the state that promotes exocytosis.

Although physicists (other than a few who believe in tachyons) usually tend to avoid tachyons in their work, it is interesting that Fred Alan Wolf (2008) recently stated some quantum field theoretical concepts associating tachyons to mind. In the past, there has been at least one theoretical physicist, Late Regis Dutheil, a quantum physicist, a consciousness researcher, who proposed a model in which mind is a field of tachyonic or superluminal matter[2].

[2] Dutheil, M.D. considered that the mind, though of tachyonic nature, belongs to the true fundamental universe and that our world is merely a subluminal holographic projection. He taught physics and biophysics at "Poitiers" Faculty of Medicine. He dedicated himself to research in fundamental physics from 1973 on. He was the author of "Superluminous Man" & "Superluminous Medicine". He was a joint Director in "Louis de Broglie" Physics Foundation in Paris. (Evellyn Elsaesser Valarino 1997)

# 3. Some Rationale for Dualism:

### *3.1 A Representation of Information is different From Information itself*

Chalmers (1996) points out that there is no convention followed by researchers as to the use of the word "consciousness" and that "as things stand, those who talk about consciousness are frequently talking past each other". The same statement applies to the word "information" because "information" is used often without a precise definition assuming that the reader should know its meaning because it is such an easy word. There are a number of phrases floating around: "physical information", "classical information", "quantum information", all of which represent a physical quality such as energy. In the context of the "hard problem" or "explaining consciousness", one has to understand "information" as Searle (1980) does: the living brain and mind deal with meanings. In this context, Shannon's definition of information does not apply because it is irrelevant to meaning or experience.

In the previous section we said that a lifeless stone does not have memory mechanisms to receive inputs and generate responses and that this lack of ability to react is what we perceive as lack of self-awareness. Hence one may ask: why then is a computer which does have memory mechanisms and which produces apparently intelligent responses, not self-aware? That is because the computer carries only a *representatıon* of information but not any "real information" or "phenomenal information" (Chalmers 1996) which only exists in the programmer's head. Still, amazingly, once a representatıon of a piece of information is entered into the computer, it can add, subtract, or a draw a picture of it, and so on; it can do almost anything that a person can do with that piece of information and behaves as though it knows the information without "really knowing" it. So, there is a certain "real information" present in human beings and probably in all living beings that is not yet found in a computer digital or quantum.

The same meaning may be conveyed by different words in different languages. Hence the meaning is different from any of the words which are used to convey the meaning. Meaning exists only in the brain but not in the words nor in the paper on which the words are written. Sometimes language is not even used to communicate information. For example, a right signal flashing from a car is an indication to others that the car is about to make a right turn. Thus the same piece of information can be conveyed in many ways and the means of communication always uses a representation. The representation may be in the form of words, sounds, electrical signals, and so on. A language is a mapping of information into words (symbols) which become sound energy when pronounced, and particles of matter when written on a paper, and become electrical energy when transmitted over a telephone line. Yet information exists only in the brain and is different from the language or signals that are used for its communication just like water is different from its container without which it cannot be taken from place to place. We are so accustomed to using material representations to store or communicate our thoughts because we cannot help it, that we do not even recognize the fact that information and its mapping are different.

In a digital computer or even in a quantum computer, we know that the meaning is not generated within the computer but the programmer assigns the meaning to strings of bits and bytes or qubits, all of which are in their turn, mapped to the states of some specific hardware units in the computer. Thus the computer carries only a mapping of information that is within the

programmer's brain but does not actually contain the meaning. So when we talk about information (data and algorithms) contained in a computer, we are referring to the mapping contained in the computer, of a certain phenomenal information which is really outside the computer. If the computer is broken, we can still run the software on another computer provided we have saved a copy of the software on a storage device such as a CD (compact disc). The point is that software exists independent of any computer hardware although the software existence and features can be recognized only when it executes on a piece of hardware by receiving some inputs and producing some outputs.

It is not that reductionists (those who argue that consciousness is a state of matter) think that a computer knows the meaning of its memory contents but they believe that the biological matter in a living brain somehow creates the meaning although any matter outside the brain does not. However, they have yet to prove what they believe.

Vedanta is dualistic in the sense that it asserts that just like in the computer, the living brain's software, namely, the mind is also "real information" and it is not a form of matter or a material energy field; it consists of tachyonic matter, and cannot be created from ordinary matter all by itself. (However, mind interacting with matter can produce more mind; see the next section.) According to this philosophy, the physical body and mind of a living being are two different components in the sense that one cannot be transformed into the other unlike matter and energy which do transform into the other in some situations. However, body and mind do interact. Life is the process of interaction between the body and the mind (in the computer analogy, this interaction is similar to execution of software). Life begins when mind starts interacting with the body and lasts as long as the interaction continues. At death, the body is no longer able to support the interaction (just like a computer with defective hardware does not support software execution). The reincarnation principle of eastern religions, Hinduism and Buddhism for example, states that a living being's mind does not cease to exist when the being dies but survives and that the surviving mind can start interaction with another body if a suitable body is found; in other words, take a new life. This can now be seen as being similar to the following scenario involving a computer's software and hardware: a computer with broken hardware cannot run a piece of software which if saved on a CD, can be entered into another computer and made to run again! Needless to say that it is only an analogy and the principle itself is not yet proved by modern science. However, it is the subject of recent investigations by some parapsychologists and gaining support from modern scientists such as Carr (a physicist) and Smythies (a neuroscientist).

One school of Vedanta called Advaita is known as monism because it explains elaborately that Consciousness alone appears as the various forms in the universe, mind, matter, and all. The well known example given is that Consciousness is like gold and all objects in the universe are like jewels made out of gold. Since Advaita also claims that this fact can be realized only by spiritual means beyond the mind and beyond all external means, the monistic part does not conflict the dualistic part described above. Other schools of Vedanta called Vishishta Advaita (translated as qualified monism) and Dvaita (dualism) agree with Advaita that Consciousness is the source of creation and all three schools believe that every individual living being is associated with its own Jiva (translated as soul) which is also immortal just like Consciousness. Whereas Advaita says that the soul is under the delusion that it is distinct from Consciousness as long as it identifies itself with a body-mind complex, but that the soul realizes oneness with Consciousness once the

delusion is gone (by suitable spiritual practices when the body is alive), the other two schools believe that all souls remain distinct and distinct from Consciousness (God) and from Nature forever. However, since all schools agree that the soul is not the mind, that mind is insentient, fast and restless, and that some part of the mind survives death of the physical body, and believe in reincarnation (mind-body dualism), the proposal that the mind may consist of tachyons is consistent with all schools of Vedanta.

## *3.2 Desire, Purpose, Aristotle's Final Cause and Free Will*

### *3.2.1 Problem Solving and Inductive Reasoning*

Inductive reasoning sees a common feature, a pattern, or a relation in the data presented and generalizes the finding by assuming it to be applicable to new cases. Induction involves anticipation from experience (Von Wright 2000: p 13). Hence an element of uncertainty is associated with conclusions obtained by inductive reasoning. On the other hand, deduction is an inference process that generates conclusions from general rules and facts; therefore one can be sure that a deductive conclusion is true if the premises from which it is derived are true. The reasoning by which a scientist formulates a theory to explain the observed facts is inductive; that is why a scientific theory is usually accepted only after it is thoroughly tested experimentally. The reasoning by which a mathematician proves a theorem from already proved theorems and axioms is deductive and theorems are accepted unless a flaw is found in the logic of its proof. One need not be a scientist or a mathematician to be able to argue inductively or deductively. In daily life, we use both these types of reasoning often. For example, if we have to go out when rain is in the forecast, we take an umbrella with us. The reasoning that goes on in my brain when I pick the umbrella would be as follows: I recall from my memory a repeated observation (O) of people not getting wet in the rain if they use an umbrella. Then I make the assumption (A) that the observation will remain the same in the future and for all people (but usually not even aware of assuming so). Then from the observation O and assumption A my brain makes the inductive conclusion IC: "I will not get wet in the rain if I use the umbrella". Then from IC and my desire D: "I do not want to get wet when I am out in the rain", I deductively arrive at the conclusion DC: "I should have the umbrella with me". Since IC is not a certainty and only an anticipation, for example, the umbrella may not work if the wind is too strong, philosophers discuss the so called Problem of Induction regarding the merits and defects of anticipation. We are not concerned here with justifying or finding fault with the assumption A; we will be concerned with another aspect of our thinking which is also related to the future and which occurs only too often. In the above example, one of the premises used to derive the conclusion DC is the desire D that I want to stay dry when it rains in the future; it is information about a future state of mine. D is essential for the conclusion DC because otherwise for example, a child for whom getting wet is fun may go out to play in the rain without an umbrella. Whether to take the umbrella or not depends upon whether one wants to stay dry or get wet in the future. All living beings and human beings in particular, almost always have a motive, a desire, or a purpose (called final cause by Aristotle) which makes them do whatever they do[3], in order to achieve a goal. For example, a person takes a plane or a

[3] That need, want, and desire guide, determine, and induce action is Hume's theory also. He believes that reason does not oppose passion but that reason only helps us discern what is true or false. It does not tell us what to do, what to care about etc. It does not tell whether to act or not but only tells the consequences of an action. Furthermore, he believes that reason is inert since it does not initiate, but only channels the impulse to act. Unlike Hume and other

train because he/she wants to go to a place other than where he/she is at present. A cat jumps on a mouse in order to kill it. Note that jumping happens now and killing the mouse later but the cat has figured out that it should jump on the mouse first and it does just that. The point is that a desire or purpose involves a yet to be realized state of affairs. Yet, the desire to achieve an end is what starts the process of figuring out a means and implementation of the means for the sake of the end which is a future state when this process begins.

Of course, free will may play the most important part in initiating an action by choosing the purpose of the action. For example, free will may choose either to go or not to go on vacation; free will may also decide whether to go to New York or London. Once the choice is made, say London, it becomes the desire to go to London (and a content of the brain's memory). The appropriate action starts with buying a flight ticket to London and depends upon the information of the future state of being in London. Indian philosophy makes a distinction between desires or purposes and free will as follows: Note that we said above that free will "may choose" the desire or purpose and not "chooses" the desire or purpose because the desire or purpose of a given action may itself be the result of other desire/s or purpose/s and not necessarily the choice of free will. For example, suppose one chooses to go on vacation (call the desire W) because he/she wants to have fun by being away from home. Then W is the effect of the cause consisting of two desires: W1 = wanting to have fun and W2 = wanting to be away from home together. Since both desires W1 and W2 are already in the memory, W is a result of a past state of the brain but not a direct creation of free will. One can now see that given any action, it is difficult to judge whether the action is initiated by free will or some desires or purposes already existing in the memory. The distinction between desires or purposes and free will is that the former are contents of a certain memory (the mind) whereas the latter is not. Indian philosophy views desire as essential to the creation and maintenance of life in this world (Röer 2012); like any other content of the mind it is different from both lifeless matter and free will.

In any given situation, prior to taking an action, one first thinks about what one wants (called volition, passion, desire, etc.) and then how to get it (reasoning). The how-to-get-it part is known as problem solving in computer science. Problem solving and planning are among those considered as "intelligent" behaviors by Artificial Intelligence (AI) experts. Today's AI programs solve many complex problems and come up with solutions more efficient and elegant than those which would have been obtained by human experts without the use of the AI programs. Note that these programs help the experts only with the how-to-get-it part of the thinking prior to the action to achieve whatever it is that the experts want to achieve. It is as though the programs do the reasoning for the experts instead of them doing the required reasoning in their minds. However, the program execution has to be started by an external input which then tells the program what to get. For example, a chess playing program plays chess very cleverly and beats most chess players. When the opponent's move is entered and go-button hit, it causes execution of some instructions stored in the computer memory and the program generates a strategy for win. It is as though the go-hit has told the program that its goal is to win and take action accordingly and immediately because without the go-hit the program would not have run; the chess playing program makes no move by itself because it has no desire to win! The input tells the program what its future state should be, namely that it should be the win state. Once this

philosophers, we are not interested here in the topic of whether the end justifies the means but interested only in the fact that the end is a future state when action begins.

information is entered into the memory by a go-hit, it becomes part of the information of the very first state in the subsequent execution process. Every state in this process is the result of a past state or past states and the digital computer obeys the causality principle of classical physics. The computer enters a state because of what it has gone through but not because it wants to get into a future state. A quantum computer would play the chess game much faster and using cleverer strategies because it has much more capacity for storing information and parallelism for processing. Still, the algorithmic capacity of a quantum computer does not extend the class of functions computable by a conventional Turing machine and just like in a digital computer, a program execution can be started only by an external agent whether it is a human being, or living being or another computer program, or any other physical device.

On the other hand, human beings almost always do whatever they do because they want to be somewhere or get something or be somebody, etc. The "want" or desire is all about a future state. This desire (or motive, purpose, goal etc.) needs to be input to the computer from outside in order that it starts the search for the problem solving strategy and then carry out the strategy whereas in a living being the desire is somehow created internally.

### *3.2.2 Causality:*

In the previous section, we saw that actions of living beings are often initiated by desires and purposes which are associated with future states of the living being. The search for an appropriate course of action and the action itself depend upon some information about a future state; for example, if I want to go to New York I will take a bus to New York but not to Philadelphia. Therefore, in my brain, information about an imagined future state causes a change to its present state by initiating the appropriate action. It has been argued (Nagel 1979) that this state of affairs may seem as being retro-causal to our intuition but that it does not involve backward causation because the neural correlate (NC) of the imagined goal is already present in the brain and the imagined goal is a possible future state but not necessarily an actual future state. Still, since the NC is a mapping of a not-yet existent possible physical state into my present memory, although the brain may acquire the information required to build this NC from the environment and its memory, the following question remains unanswered: How does the brain assign a "future state" label to the neural correlate as opposed to a "past state" or the "present" label? [4] As said before, in the case of the chess program, the operator tells it what its future state should be, and initiates it to take the appropriate action to reach the win state; therefore there is no causality violation by the computer in its goal achieving process. Since the brain is also a material system after all, does it not need an external agent (mind or Consciousness) to initiate the goal achieving process? – This is also a not-yet-answered question in science.

In the present context, the paper "Causality and Tachyons in Relativity" written by Caldirola and Recami (1980) is particularly interesting. In the section with title 'Can a Tachyonic Observer

[4] How the brain creates perception of time is most likely a "harder problem" than it is to explain why subjective experience arises in the brain. This is because time consists in ordering into a sequence as it were, by the brain, its already-occurred as well as imagined experiences but the brain does not receive any ordering information in sensory inputs from any physical object in the outside world. Physical clocks are constructed by us to express the perception of time similar to the way a language is developed by assigning meanings to words and specifying rules of grammar, expecting all users of the language to use the language according to the specified meanings and rules. Thus, physical time is a representation of subjective time and created by humans for use in communications.

Inform Us about Our Future?' of this paper, the authors conclude that a tachyonic observer can convey to an ordinary observer the effects on a future event E of the anti-signals (negative-energy signals) sent by himself to E so as to physically influence E. Hence the tachyonic observer seems to be doing the job of the how-to-get-it reasoning of section 3.2.1. According to Hume (1990, p413-418), one's reason does the same job by telling that individual the consequences of an action. Pavšič (1981) also suggested the possibility of tachyons informing an observer about a future event and the possibility of the observer's experiencing in his future some other events, and not those about which he has been informed by means of tachyons.

## 4. The Physical Brain Creates More Mind Not All By Itself but With the Help of an Already Existing Mind

In the case of a lifeless computer, we know that programs can learn; they can even discover new formulas and theories from the data input to them. When a computer program learns, actually it creates in its memory new contents as patterns of states of its memory cells. The new information that the program is said to have discovered is obtained only by the programmer's assigning meaning to the computer's output consisting of numbers and letters (a certain language) corresponding to the newly created memory contents. The meaning to any language once again, is in the heads of programmers but not in the symbols of the language itself. So, the computer does not know the meaning of the new formulae it has created but the meaning is known only to the programmer or user. Another point to note here is that to create even such new patterns of memory cells though not new information itself, a certain piece of software is required to be present and complete execution in the computer; a machine which has no software or which cannot execute software cannot learn; in AI terms, such a machine cannot exhibit "intelligence".

As to the living brain, it starts learning from the moment it is born. Even if it does not learn new techniques of how to respond to situations, it constantly interacts with the environment and stores the experience and thereby creates new memory. Brain scientists do recognize formation of neuron patterns indicating creation of new memories. To be able to create new patterns of physical memory, similarly to the computer, the brain should already have some mind (brain's software) prior to interacting with its environment and it does according to today's brain science. Hence both reductionists and dualists would accept that the living brain (physical brain with mind) creates more mind upon interaction with the environment. Yet unlike the computer, nobody from outside assigns or can assign meaning to newly created neuron patterns but the living brain does it by itself. Reductionists claim that the meaning is a property of biological matter unlike the electronic circuits in the computer but they have yet to prove their claim scientifically. On the other hand, dualists think that mind is not a property of biological matter but have not yet attempted any scientific explanation of how such mind is created.

By claiming that mind is made up of tachyonic matter, Vedanta suggests a possible approach to a scientific explanation of why meaning, experience, and "real information" exist in a living brain but not in the computer or any physical means of storage or communication and how mind interacting with brain's matter can create more mind.

## 5. Subjectivity

The word subjective implies: that perception of reality is highly personal, that perception is not independent of the individual perceiving it but conditioned by personal mental characteristics or states, that it is modified or affected by personal views, previous experience, or background. Let alone human beings, and consider a robot for a moment. A robot's inferences and conclusions are always subjective because they depend upon the knowledge it already has in its memory, which includes the heuristics entered by the robot's programmer as well all the so far received external inputs (vision, sound, motor, etc.), which the robot has saved. For example, two robots may read the same answer sheet of a student from an exam, and one robot may give a "pass" grade to the student where as the other robot may "fail" the student; this happens if the definitions of "pass" entered into the robots' memories are different. So, a robot can have its own point of view. The point is that human perception is subjective for a similar reason. We saw in previous sections, that ever since birth, human beings (in general, many living species) should have a software-like entity in their system, which we called mind, since they learn from the moment they are born. Therefore, what two human beings learn, perceive, remember, or experience from same situation in the external world tend to be different at least slightly.

Vedanta insists that each individual is born with their very own *karma* (subconscious memory of past actions whose consequences will take place in the future) and *vasanas* or *samskaras* (subconsciously remembered skills, inclinations, likes and dislikes, etc.) and hence equipped with a personalized memory with software-like contents. Hence what any two individuals learn from or their perceptions of the same external environment are in general different because the perceptions and learning are responses of their software-like minds to the inputs from the environment. But is the ability to acquire subjective knowledge is all that consciousness really is? Is it something else or something more? The two robots in the example above make subjective judgments but they do not have an experience and do not know what they are doing. It seems consciousness is more complicated than subjective knowledge and inference. According to Indian philosophy, the subjective experience arises because of the ever present Consciousness observing the mind’s contents and thoughts.

## 6. Summary

Ancient Indian Philosophy makes a distinction between Consciousness (same as free will) and all other aspects of consciousness which involve memory; we referred to the latter as mind in this paper. In this literature, it is often stated that mind is faster than all senses (including sight) hence faster than light and that it never comes to rest. It is often stated that mind is a memory where all experiences, emotions, desires, etc. are stored. Mind is subtle unlike the physical body. When interpreted in the terminology of modern physics, the implication is that at least part of what we call mind is made of tachyonic matter. The proposal that the memory aspect of the mind is made up of tachyons provides a mathematical means to explain how brain creates mind and how mind acts upon the brain. It may be possible to verify this proposal experimentally as suggested in Hari (2008). To explain the views of Indian Philosophy on matter, mind and Consciousness, we compared the brain and its mind to the hardware and software of a computer, Consciousness being the computer operator as it were, and completely outside the computer and in control of it.

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