
Mental time travel is possible due to the fact that time is bound to the mind in the presence of consciousness

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Abstract: A single field emerged at the origin of the universe, already containing within itself the blueprint of the physical universe. The primordial single field triggered the onset of the universe. Most physicists believe that a single super-force dominated the first instants of creation. Scientists have arrived at a simple but decisive conclusion that consciousness is very much a part of the universe, like other objects. Our consciousness model involving thought-carrying particle (TCP), thought retaining particle (TRP) and thought force (T_F) signifies the existence of universal consciousness that exists along with the universe. This universal consciousness is a functional state of the universal mind. This universal mind (UM) is evolved at the Big Bang from void. The UM is constituted by these TCP and TRP in the inherent presence of thought force (T_F). Thought force (T_F) is an expression of universal consciousness. The Thought force (T_F) being the primordial quantum field functions as the original super-force. T_F being the original super-force functions as the origin of all the fundamental fields. Thought force (T_F) being the primordial quantum field gives birth to TRP that appears to be the origin of all the matter particles. TCP is the carrier of thought force (T_F) that, in turn, appears to be the origin of all the fields. TCP thus appears to be the origin of all the field particles. The quantized energy (ϵ_T) of TCP is responsible to cause the universal consciousness as well as the cosmic microwave background radiation temperature. The individual consciousness owes its origin to the universal consciousness created by the same ϵ_T . The same ϵ_T is the energy responsible for generating thought force (T_F). T_F being an expression of the universal consciousness is applicable to any inanimate object as well as to any biological system (having thinking ability). The T_F exerts its functions both *in vitro* and *in vivo*. Time of any kind cannot exist without the existence of consciousness. Time without consciousness is not possible. But consciousness without time is possible due the existence of universal consciousness. The manifestation of any type of time is solely dependent on the manifestation of consciousness. There is no manifestation of 'time' unless there is the generation of consciousness [$= \epsilon_T = m_T c^2 = hc / \lambda_T$ (where m_T = quantized mass of the TCP, c = free-space velocity of light, h = Planck's quantum constant, λ_T = wavelength of the TCP)]. It is shown here that mental time travel is possible due to the fact that time is bound to the mind in the presence of consciousness.

Keywords: Cosmic Microwave Background Radiation (CMBR), Universal Mind (UM), Thought Force (T_F), Thought-Carrying Particle (TCP), Thought Retaining Particle (TRP), Quantized Energy (ϵ_T) of TCP

1. Introduction

It is most relevant and important to indicate the names of many eminent physicists like Max Planck, Erwin Schrödinger, Eugene Wigner, David Bohm, Roger Penrose, Amit Goswami, John Wheeler, Henry P Stapp, Freeman J. Dyson and Brian Josephson who have addressed either the significant role of consciousness or the requirement of inclusion of consciousness. Many of them indicated the existence of universal consciousness.

Planck [1] commented, "I regard consciousness as fundamental. I regard matter as derivative from consciousness. We cannot get behind consciousness. Everything that we talk about, everything that we regard as existing, postulates consciousness.

Schrödinger [2] had written, "Vedanta teaches that consciousness is singular, all happenings are played out in one universal consciousness and there is no multiplicity of

selves”.

Wigner [3] commented "It was not possible to formulate the laws (of quantum theory) in a fully consistent way without reference to consciousness."

Bohm [4] had written: "I would say that in my scientific and philosophical work, my main concern has been with understanding the nature of reality in general and of consciousness in particular as a coherent whole, which is never static or complete but which is an unending process of movement and unfoldment..."

Penrose [5] indicated: "Consciousness is a part of the universe".

Goswami [6] has written "Consciousness, not matter, is the ground of all existence"

Wheeler [7] suggested that information is fundamental to the physics of the universe. According to this "it from bit" doctrine, all things physical are information-theoretic in origin and that this is a participatory universe.

Wheeler has speculated that reality is created by observers in the universe. "How does something arise from nothing?", he asks about the existence of space and time (*Princeton Physics News*, 2006). He also coined the term "Participatory Anthropic Principle" (PAP), a version of a Strong Anthropic Principle.

Stapp [8] on consciousness:

Work of Stapp [8] concerns the implications of quantum mechanics for consciousness. Stapp favors the idea that quantum waves collapse only when they interact with consciousness. He argues that quantum waves collapse when intelligent brains select one among the alternative quantum possibilities.

Stapp postulates global collapse via his 'mind like' wave-function collapse. His views are spelled out most clearly in his book, *Mindful Universe: Quantum Mechanics and the Participating Observer*.

Dyson [9] pointed out:

"As we look out into the Universe and identify the many accidents of physics and astronomy that have worked together to our benefit, it almost seems as if the Universe must in some sense have known that we were coming". As quoted in *The Anthropic Cosmological Principle* (1986) by John D. Barrow and Frank J. Tipler, p. 318. This statement signified the existence of universal consciousness.

Josephson [10] has the following comment when asked: Do you think quantum mechanics, or some more advanced physical theory, could in principle explain the origin of consciousness? : I think consciousness just has to be taken as 'given'.

It is interesting to note that Journal of cosmology published an entire edition on Consciousness edited by Sir Roger Penrose [volume 14, (2011)] and covered various aspects of consciousness. Many scientists here also indicated the existence of universal consciousness, thus showing the ultimate relationship of consciousness with cosmology.

Pino and Di Mauro [11] mentioned: "Consciousness is a property and a manifestation of life, life is universal in

principle, consciousness is in principle universal".

Gao [12] pointed out... "Consciousness is not emergent but a fundamental feature of the universe".

Kafatos et al [13] expressed: Consciousness and matter are not fundamentally distinct but rather are two complementary aspects of one reality, embracing the micro and macro worlds. This approach of starting from wholeness reveals a practical blueprint for addressing consciousness in more scientific terms.

The ultimate relationship of consciousness with cosmology is shown by King [14].

The existence of universal consciousness is explained by Radin [15].

Many physicists agree with the idea that consciousness is non-local, fundamental in the universe and consciousness is very much a part of the universe, like other objects.

From the above statements of many scientists regarding consciousness, it is apparent that consciousness is to be taken into account. Even many scientists indicated the existence of universal consciousness. But none of them published any article to show the evolution of the universe along with the universal consciousness. If the universe exists along with the universal consciousness, then the universe is liable to be evolved along with the universal consciousness. It appears that the universe actually evolved along with the universal consciousness. Then we should have a plausible theory and possible process to explain this evolution of universe along with the universal consciousness. No such theory is found in the science literature. For this reason, a plausible possible consciousness model involving Thought-carrying particle (TCP), Thought retaining particle (TRP) and thought force (T_F) was developed and published to show the evolution of universe along with the universal consciousness.

The developed and designed Scheme-I is attached in the article for explaining the possible process.

There was a necessity to incorporate new words in repeated proper sequences to show the evolution of universe along with the universal consciousness as shown in Scheme-I.

Pal [16] published an article entitled, "Interpretation of the evolution of universe through the consciousness model".

Pal [17] published another article entitled, "Existence of Thought Force and Its Characteristics".

Consciousness model of Pal *et al* [18, 19, 20] involving TCP, TRP and thought force (T_F) signifies the existence of universal consciousness that exists along with the universe. Pal *et al* [20] showed that the functional state of Universal Mind (UM) is the universal consciousness that exists along with the universe. Pal *et al* [20] explained that the UM is evolved at the Big Bang from the eternal Void (see Scheme-I). This Void, in turn, is the source of infinite energy. As per Hawking [21], the Heisenberg's uncertainty principle established that even "empty" space is filled with infinite pairs of virtual particles and antiparticles. These pairs would have an infinite amount of energy and

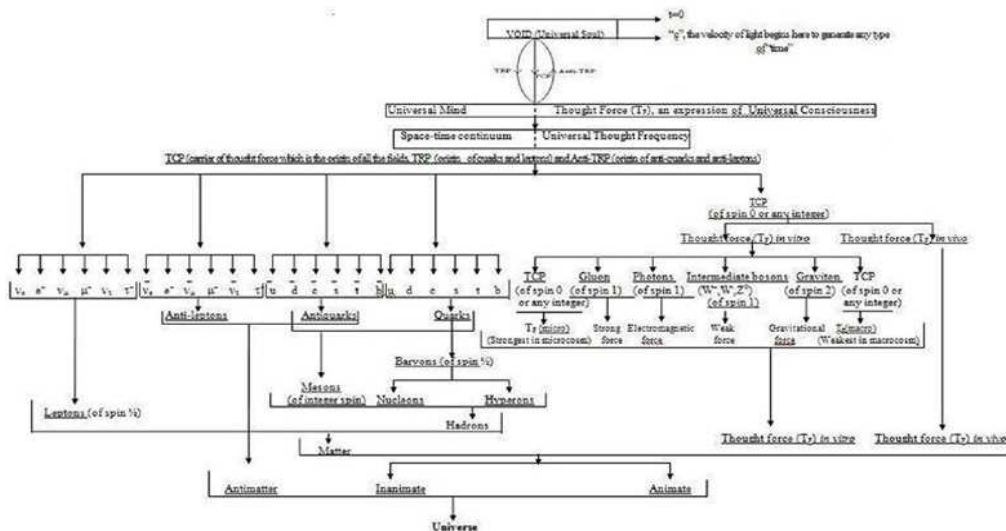
therefore, by Einstein's equation: $E = mc^2$, they would have an infinite amount of mass. Without the uncertainty principle to forbid nothingness, there might not even be a universe.

This UM is a finer matter. The individual mind being a constituent of the UM is also a finer matter. The constituents of the UM and individual mind are the same. The ultimate constituents of matter and mind are the same as both mind and matter are aspects of one fundamental reality, which is called UM. The brain is the mediating link or interface between the individual mind and body.

Pal *et al* [20] explained that the constituents of the UM are the ultimate constituents of matter itself as everything in this universe is a manifestation of this UM. Pal *et al* [20] expressed that the UM is constituted by these TCP and TRP in the inherent presence of thought force (T_F). Pal *et al* [18, 20] further explained that the ultimate constituents of matter and mind are these TCP and TRP in the inherent presence of thought force (T_F) *in vitro* and thought force (T_F) *in vivo* [See Scheme-I].

1.1. General View for the Evolution of the Universe

Big Bang \rightarrow Universe \rightarrow [Fields + Particles & Antiparticles + STC] \rightarrow [Matter and Fields + STC] \rightarrow Matter



Scheme-I: Schematic representation showing the evolution of the universe from the void incorporating the postulated TCP (Thought carrying particle), TRP (Thought retaining particle), and thought force (T_F). Laws of absolute conservation of mass, charge (and color) are to be maintained in order to develop a general theory for the unification of physics which would be freely applicable to the more general situations involving the non-living system and living system having consciousness. Here TCP is the carrier of the thought force (T_F) that, in turn, is the origin of all the fields. TRP is the origin of all the matter particles. It is to be noted that these TCP and TRP function like wave: wave-particle duality. Here thought force (T_F) is an expression of the "universal consciousness".

Dhananjay Pal Figure -I.jpg

Bhaumik [22] mentioned, "It would be reasonable to presume that the universe originated in a unity of all fields at or near Planck's dimension. John Wheeler strongly believed that "in defining any useful concept of reality" we have to take into account "the indispensable place of the

and Fields + STC + Life as well as consciousness.

If the universe exists along with the universal consciousness that, in turn, is a functional state of the universal mind (UM) and if this UM is evolved at the Big Bang from the eternal void, then

Our view for the evolution of the universe (see Scheme-I):

VOID \rightarrow [Big Bang] \rightarrow [TCP, TRP & Anti-TRP in the inherent presence of thought force (TF) + STC] \rightarrow [Universal Mind with universal consciousness + TCP & TRP in the inherent presence of thought force (TF) + STC + UTF] \rightarrow [Universal Mind with universal consciousness + Matter and Fields {including thought force (TF)} + TCP & TRP + STC + UTF] \rightarrow Universal Mind with universal consciousness + Matter and Fields {including thought force (TF)} + Life as well as consciousness + TCP & TRP + STC + UTF [where thought force (TF) is the origin of all the fields, TCP (Thought-carrying particle) is the origin of all the field particles, TRP (Thought retaining particle) is the origin of all the matter particles, anti-TRP is the origin of all the anti-particles, STC = Space time continuum and UTF = Universal thought frequency \equiv frequency of the TCP].

participating observer---evidenced in quantum mechanics," the foregoing cannot be really true unless consciousness is as essential as aspect of nature as are the fields that give rise to force and matter and the primary field that gave rise to them".

Physicists determined that underlying quantum fields give birth to elementary particles. Bhaumik [22] mentioned that Frank Wilczek pointed out, "In quantum field theory, the primary elements of reality are not individual particles, but underlying fields. Thus, for example, all electrons are but excitations of an underlying field, naturally called electric field". The same holds true for all the fundamental particles of which matter is made.

TCP cannot exist without TRP and vice versa. Many physicists believe that unifying all the forces, including gravity, into a single theory would require a phenomenon called super-symmetry. With super-symmetry, every fermion would have a boson twin, and vice-versa. TCP that behaves like boson should accompany its super-symmetrical partner TRP that functions like fermion in the generalized simpler way. Thus TCP like boson cannot have anti-particle. But TRP that functions like fermion should have its anti-particle and here it is shown as Anti-TRP (see Scheme-I). It is to be noted that these TCP and TRP function like wavicle: wave-particle duality. Pal [17] explained the existence of the thought force (TF) that, in turn, is the primordial quantum field.

1.2. Evolution of Universe from universal consciousness

In contrast to the usual linear sequence of matter, body, life, brain, mind, consciousness, here the proposed cyclic sequence is first universal consciousness (a functional state of the universal mind), and then matter, body, life, brain, and regeneration of mind and consciousness. The evolution of life with mind and consciousness is possible purely due to the inherent existence of universal consciousness which exists along with the universe. The human nervous system is evolved to provide an appropriate material structure to individualize the universal consciousness, a characteristic of reality, pervading all manifestations.

1.3. The value of the quantized energy (\mathcal{E}_T) of TCP

Pal et al [20] developed three different equations expressing the quantized energy (\mathcal{E}_T) of TCP. The value of \mathcal{E}_T in one of the three equations is shown below:

$$\begin{aligned} \mathcal{E}_T \\ = 4.384 \times 10^{-16} \text{ erg} \equiv 2.73 \times 10^{-4} \text{ eV} \equiv 2.73 \text{ K} \equiv \text{CMBR temperature} \equiv 2.725 \text{ K} . \end{aligned}$$

This conversion of $\text{erg} \equiv \text{eV} \equiv \text{K}$ is given by Weisskopf [22a] as follows:

$$1 \text{ erg} \equiv 0.6241807 \times 10^{12} \text{ eV} \text{ and } 10^{-4} \text{ eV} \equiv 1 \text{ K}$$

1.4. CMBR Temperature

Pal et al [20] expressed that the CMBR temperature is due to \mathcal{E}_T , the quantized energy of TCP where

$$\begin{aligned} \mathcal{E}_T = 4.384 \times 10^{-16} \text{ erg} \equiv 2.73 \times 10^{-4} \text{ eV} \equiv 2.73 \text{ K} \equiv \text{CMBR} \\ \text{temperature} \equiv 2.725 \text{ K} . \end{aligned}$$

As per Pal et al [20], it is interesting to note that all of the three different equations ultimately give rise to the same result that is equivalent to the CMBR temperature. A sort of relationship is thus observed between the \mathcal{E}_T and the CMBR temperature. This coincidence is thus signifying a probable role of TCP on the maintenance of CMBR temperature. Further, this coincidence is also signifying the existence of these TCP in the presence of TRP. TCP cannot exist without TRP and vice versa. The presence of TCP, TRP and Thought force (TF) in the universe is thus indicated and expressed mathematically. At present we are unable to explain when and how these TCP and TRP decoupled from the primordial cosmic soup.

Pal et al [20] showed that the quantized energy (\mathcal{E}_T) of TCP is responsible to cause the universal consciousness as well as the cosmic microwave background radiation temperature. The individual consciousness owes its origin to the universal consciousness created by the same \mathcal{E}_T . Ultimately this \mathcal{E}_T represents universal consciousness.

2. Thought Force

Pal [17] explained that the quantized energy (\mathcal{E}_T) of TCP is the energy responsible for generating thought force (TF); thus the TF may be expressed as

$$\text{TF} = \mathcal{E}_T / \text{Di} \quad (1)$$

where Di = Interacting distance.

The thought force (TF) has been postulated to be carried by TCP in the inherent presence of TRP. The TCP being the carrier of the TF would behave like bosons when TRP would function like fermions.

Depending on the Di (= Interacting distance), it is possible to calculate and identify two new forces viz. TF (micro) [= Thought force in microcosm] and TF (macro) [= Thought force in macrocosm], the existence of which is indicated and expressed by Pal [17].

Pal [17] explained that Thought force (TF), an expression of the universal consciousness, is the primordial quantum field that, in turn, functions as the primary unified field. This TF being an expression of the universal consciousness is applicable to any inanimate object as well as to any biological system (having thinking ability). Thus the TF being an expression of the universal consciousness exerts its functions both *in vitro* and *in vivo*.

Physicists determined that underlying quantum fields give birth to elementary particles. Pal [17] expressed that the thought force (TF) is the primordial quantum field. Thought force (TF) being the primordial quantum field functions as the primary unified field. Thought force (TF) being the primordial quantum field gives birth to TRP that

appears to be the origin of all the matter particles. TCP is the carrier of thought force (TF) that, in turn, appears to be the origin of all the fields. TCP thus appears to be the origin of all the field particles (see Scheme-I).

In a purpose to involve both the non-living and living systems of the world, Pal [17] has shown the existences of these TCP, TRP and thought force (TF) *in vitro* and thought force (TF) *in vivo*. Anyone can call this TCP by any other name, but as the highly developed living system will have to be evolved in the universe in the long run and as the thought of highly developed living system appears to be a kind of force to be called the thought force (TF) *in vivo*, we considered it is wise to call it as TCP. Further, as the universe exists along with the universal consciousness that, in turn, is created by the quantized energy (\mathcal{E}_T) of TCP, we had to use the term TCP.

Pal [17] expressed that the non-living system of the world is governed by the thought force (TF) *in vitro* and this Thought force (TF) *in vitro* gives rise to TF (micro), SNF, EMF, WNF, GF and TF (macro)

where TF (micro) = Thought force in microcosm, SNF = Strong nuclear force, EMF = Electromagnetic force, WNF = Weak nuclear force, GF = Gravitational force and TF (macro) = Thought force in macrocosm. It is to be noted here that TF (micro) is a stronger force than the SNF and TF (macro) is a weaker force even than the GF.

Pal [17] also expressed that the living system of the world is governed by the thought force (TF) *in vivo* and this Thought force (TF) *in vivo* is a type of force that represents the biological 'thought' which is the action of mind. This 'thought' being a type of force controls the 'thought processes' involving the firing of neurons through the quantum mechanical activities of these TCP and TRP in the presence of consciousness. This consciousness, in turn, is the quantized energy (\mathcal{E}_T) of TCP. The thought force (TF) *in vivo* is demonstrated in numerous experiments in which thought has an effect on a physical process (often known as mind over matter). This biological 'thought' is a type of force that can cause movement. Controlling movement through thought alone is observed in several experiments conducted by many scientists as indicated by Pal [17]. These experiments thus signify the existence of thought force (TF) *in vivo*.

Pal [17] explained the existence of TF (micro) (= Thought force in microcosm). This TF (micro) is the strongest interaction (a new class of 'extra strong' interaction) indicated by Weinberg [23] and Quigg [24]. It is stronger than SNF (Strong Nuclear Force). And this TF (micro) confirms the existence of TCP in the inherent presence of TRP in the microcosm.

Pal [17] has also shown the existence of TF (macro) (= Thought force in macrocosm). It is the "weakest force" which is much weaker even than the gravity as explained by Perkins [25] and indicated by Weinberg [23]. This TF (macro) confirms the existence of TCP in the inherent presence of TRP into the quantum geometry of the universe.

3. How to Define and Interpret 'Time'?

There is an arrow of time and there is something strange in the way time relates to consciousness. It is puzzling fact that the fundamental laws of both the quantum world as well as the large-scale universe are independent of time, and yet humans are actually aware of the arrow of time. Roger Penrose feels that this is a profound issue and this is the reason that both in classical physics and quantum physics there is no place for consciousness. In his book *Shadows of the Mind* Roger Penrose says, "Consciousness is a part of the universe". He believes that there is an objective world out there which exists whether it is perceived by a human mind or not, whose most remarkable manifestation, consciousness, is open to study by modern science. "Science will have to be quite seriously changed in order that consciousness can be accommodated". Penrose says, "We need something extended beyond that, where the idea of evolving time can actually make sense".

As per Hawking [21], there are at least three different arrows of time:

- I. The cosmological arrow of time begins at the Big Bang, the beginning of the universe; because the earlier time before the Big Bang could not just be defined. This cosmological arrow of time is the direction of time in which the universe expands rather than contracts.
- II. The thermodynamic arrow of time is the direction of time in which the disorder or entropy increases.
- III. The psychological arrow of time is the direction of time in which we feel time passes: the direction in which we remember the past but not the future. The psychological arrow is essentially the same as the thermodynamic arrow because these two would always point in the same direction.

3.1. What are the Characteristics of 'Time'?

Regarding the characteristics of "time", the following points are to be taken into account as indicated by Hawking [21]

- (1) The theory of relativity reveals that "time" is not absolute. It can expand or contract; nothing can travel faster than the speed of light.
- (2) Time begins at the 'Big Bang' singularity at which the universe is supposed to begin.
- (3) Time would come to an end at the 'Big Crunch' singularity at which the universe is supposed to come to an end.
- (4) Time also comes to an end at the singularity inside a black hole, which is formed due to gravitational collapse of a star to infinite density.
- (5) There is a scope to use an idea of "imaginary time" (by incorporating $i = \sqrt{-1}$) through which the distinction between time and space disappears completely.
- (6) There is no singularity or boundary in imaginary time, leading to the conclusion: The boundary condition of the universe is that it has no boundary. In imaginary time, the time is indistinguishable from directions in space.
- (7) If one can utilize the 'quantum theory of gravity' (by

unifying gravity with quantum mechanics) along with the idea of "imaginary time", then one would be able to open up a new possibility, in which there would be no boundary to space-time and there would be no singularity at which all the laws of science usually break down. This will lead to the totally "self-contained" universeThe universe is neither created nor destroyed.....it is eternal.

(8) The arrow of time: The psychological arrow = The thermodynamic arrow which agrees well with the cosmological arrow of time.

(9) "Time" is not completely separate from and independent of "space", but is combined with it to form an object called space-time.

Although "time" is sometimes expressed in the dimension of "length" (such as "long time" or "short time"), yet the time may oscillate periodically, thereby, maintaining the character of a "wave" which appears to perpetuate eternally. And this oscillating periodic character of time can clarify the truth in the philosophically uttered popular statement: "History repeats itself". This periodic or oscillating time involves change only within a cyclical pattern; so there is no sense of extension beyond that cycle. Every event in this observable universe occurs on the platform of time through which such an event is generally being expressed. The concept of personal time (psychological time) begins to function to a person at the onset of the function of his or her conscious mind.

4. What is Life?

Life without consciousness is not possible due to the existence of universal consciousness through the function of which life is liable to be evolved in the universe as indicated by Dyson [9] and as explained by Pal [26] through an article entitled, "Interpretation of the Evolution of Life and Consciousness through the Consciousness Model".

Mitra et al [27] published an article entitled, "Consciousness: A Direct Link to Life's Origins?"

Pino and Di Mauro [11] mentioned: "Consciousness is a property and a manifestation of life, life is universal in principle, consciousness is in principle universal".

It has already been explained that the universe exists along with the universal consciousness. It appears that inanimate matter itself cannot generate consciousness without the inherent existence of universal consciousness. Consciousness is a type of energy. Quantized energy (\mathcal{E}_T) of TCP = Universal consciousness. Individual consciousness owes its origin to the universal consciousness created by the same \mathcal{E}_T . Ultimately this \mathcal{E}_T represents universal consciousness.

Life is a state of flux that is being maintained by a typical form of energy which is nothing but the consciousness itself. Pal et al [20] and Pal [28] showed that the quantized energy (\mathcal{E}_T) of TCP is responsible to cause the universal consciousness as well as the cosmic microwave background radiation temperature. The

individual consciousness owes its origin to the universal consciousness created by the same \mathcal{E}_T . Pal et al [18, 20] and Pal [28] explained that life may be defined as a state of functional manifestation of consciousness that, in turn, is the quantized energy (\mathcal{E}_T) of TCP. This \mathcal{E}_T represents universal consciousness.

$$\text{Thus, Life} = f(\text{Consciousness}) = f(\mathcal{E}_T) \quad (2)$$

$$\begin{aligned} \text{where } \mathcal{E}_T &= \text{quantized energy of the TCP} \\ &= 4.384 \times 10^{-16} \text{ erg} . \end{aligned}$$

$$\mathcal{E}_T = h\nu_T = hc / \lambda_T = 4.384 \times 10^{-16} \text{ erg} \quad (3)$$

$$\begin{aligned} \text{where } \mathcal{E}_T &= \text{quantized energy of the TCP} \\ &= 4.384 \times 10^{-16} \text{ erg} , \end{aligned}$$

$$\begin{aligned} \nu_T &= \text{frequency of the TCP} \\ &= \mathcal{E}_T / h = 66.12 \times 10^9 \text{ Hz} = 66.12 \text{ GHz} , \end{aligned}$$

$$h = \text{Planck's quantum constant} = 6.63 \times 10^{-27} \text{ erg.sec},$$

$$c = \text{free-space velocity of light} = 3 \times 10^{10} \text{ cm/sec},$$

$$\lambda_T = \text{wave-length of the TCP} = 0.4537 \text{ cm} .$$

4.1. What is Consciousness?

Psychologists, neuroscientists, philosophers, and other professionals continue to engage in an ongoing debate as to what consciousness means. In reality, we may never know. Is it a product of the biological and classical physical interactions of the human brain; or is it something more fundamental, perhaps electromagnetic, or the result of quantum physics principles that we don't yet fully understand? Could it be something even more profound than that -- something beyond the scope of science and physics, any kind of physics, for us to understand? Consciousness is a fascinating but elusive phenomenon: it is impossible to specify what it is, what it does, or why it has evolved.

According to the ancient Vedanta, consciousness is not an emergent property of matter that comes into existence only through the functioning of the human nervous system. Instead, consciousness is a characteristic of reality, pervading all manifestations. This unbounded field of nature's universal consciousness is not limited to an individual consciousness. From this viewpoint, the role of the human nervous system is to provide an appropriate material structure to individualize the universal consciousness. It appears that inanimate matter itself cannot generate consciousness without the inherent existence of universal consciousness.

Pal et al [19] explained, "Consciousness is the realization of existence, and there are as many states of consciousness as there are states of existence. Every living being has a consciousness of its own depending on complexity of the brain and the activity of the viable numbers of TCP in the presence of TRP; and the state of its consciousness changes every moment of time.

Consciousness is the perception of the relation it bears to things and as this relation changes, consciousness changes its character. Consciousness itself does not change; it only moves up and down on the 'scale of the realization' of existence through the 'sub-conscious', 'conscious' and 'super-conscious' states".

There is another term called unconscious state. The most usual unconscious state is sleep. A deeper form of unconsciousness is called a coma.

4.2. Possible Relation of Consciousness with Mind:

Possible Relation of Animate with Inanimate through Consciousness

Modern scientists have not even been able to arrive at a consensus on what should be a definition of the totality of consciousness. The brain is intricately linked to the process of consciousness and consciousness is thought to be a phenomenon of the mind.

It appears that

$$\text{Consciousness} = f(\text{mind}) \quad (4)$$

Consciousness is the functional state of mind. Presence of consciousness signifies the presence of mind and vice versa.

It is apparent that

$$\text{Animate} \neq \text{Inanimate} \quad (5)$$

Three critical factors which distinguish life from non-living are consciousness, metabolism and reproduction.

In a gross presentation, we can express from the Eq. (5):

$$\text{Animate} - \text{Consciousness} = \text{Inanimate} \quad (6)$$

Scientists would have to define and characterize consciousness properly. We should have the proper knowledge about the exact characteristics of consciousness in order to address many present day scientific enigmas.

4.3. Consciousness may be Defined as the 'Self-Organized' Capability of any Living being to Activate TCP and TRP

Pal et al [20] expressed that consciousness may be defined as the 'self-organized' capability of any living being to activate TCP and TRP, the ultimate constituents of mind and matter and to exert its functions. What can generate, maintain and activate TCP and TRP is called animate having 'active consciousness' and what cannot is called inanimate, i.e., devoid of active consciousness. As anything inanimate does neither have the power to activate the TCP and TRP nor have the capability to catalyze the activity of TCP and TRP, so it cannot generate consciousness. On the contrary, anything animate has the 'self-organized' power to generate, activate and catalyze the activity of TCP and TRP in order to generate and maintain consciousness along with the vital living force. Prigogine et al [29] explained "Self-Organization in Non-Equilibrium Systems".

As per Edelman, a Nobel Laureate, consciousness is a process, a chain of events, rather than a 'thing' contained in a special part of the brain. Pal et al [18, 20] and Pal [30] expressed that Consciousness in living organisms is a process which involves the quantum mechanical activities of these TCP and TRP, the ultimate constituents of any matter as well as any mind in the inherent presence of thought force (T_F) *in vitro* and the thought force (T_F) *in vivo*.

And these TCP and TRP govern the activities of neurons (not the other way round). Neurons are simply the equipments used to generate consciousness and awareness. The consciousness itself is functioning as an inter-linking agent between the animate and inanimate through the quantum mechanical activities of these TCP and TRP indicated by Pal et al [20].

5. Existence of Universal Consciousness

Pal et al [20] and Pal [28] showed the existence of universal consciousness and explained that the quantized energy (ϵ_T) of TCP is responsible to cause the universal consciousness as well as the cosmic microwave background radiation temperature. The individual consciousness owes its origin to the universal consciousness created by the same ϵ_T .

Pal et al [20] have expressed that according to the modern physicists, the universe is the summation of fields, particles, space-time continuum, dark matter, dark energy, void and all the known and unknown parameters of the universe along with all its inhabitants (with or without consciousness), although the universe is always expanding.

The method of integration indicates that

$$\int dx = x + c$$

where c = a constant. Is there any mathematical fallacy if we like to use 'universe' in the place of 'x' here? If we at all theoretically like to apply the same method of integration to the whole universe itself, we will have to arrive at

$$\int d(\text{universe}) = \text{universe} + c$$

where universe = universe with all its known and unknown parameters as well as its inhabitants (with or without consciousness) and c = a constant. The constituents of the universe are fields, particles, space-time continuum, dark matter, dark energy, void, all its inhabitants (with or without consciousness) and all the other unknown parameters of the universe that we have not yet faced. We simply propose to apply the method of integration theoretically over the universe as a whole with all its known and unknown parameters and all the inhabitants (with or without consciousness). If we at all theoretically like to do so, we will mathematically arrive at a constant.

What is this constant here? It is our opinion that this

constant is the universal consciousness that exists throughout the universe in the form of universe wide web (uww) covering fields, particles, space-time continuum, dark matter, dark energy, void and all its known and unknown parameters along with all its inhabitants (with or without consciousness). This universal consciousness is to be taken into account, but usually ignored.

Nelson [31], Director of Global Consciousness Project, has observed through the experimentation that coherent consciousness creates order in the world; and subtle interactions link us with each other and the Earth. When human consciousness becomes coherent and synchronized, the behavior of random systems may change. Quantum event based random number generators (RNGs) produce completely unpredictable sequences of zeroes and ones. But when a great event synchronizes the feelings of millions of people, our network of RNGs becomes subtly structured. The probability is less than one in a billion that the effect is due to chance. The evidence suggests an emerging noosphere, or the unifying field of consciousness described by sages in all cultures. This evidence signifies and proves the existence of universal consciousness.

The existence of universal consciousness is explained by Radin [15] through experimentation as it is expressed in his book "The Conscious Universe: The Scientific Truth of Psychic Phenomena". Further, Consciousness, not matter, is the ground of all existence, declares University of Oregon physicist Goswami [6] through his published (1993) book, "The Self-Aware Universe: How Consciousness Creates the Material World".

As per Penrose [5], consciousness is a part of the universe. Van De Bogart [32] explained, "Since consciousness is a part of the universe it then follows that all consciousness, and the universe, are of the same matrix of energy fields".

Many physicists agree with the idea that consciousness is non-local, fundamental in the universe and consciousness is very much a part of the universe, like other objects. It is to be noted that \mathcal{E}_T , the quantized energy of TCP represents universal consciousness.

The entire Universe or the particles in it are 'connected' through the existence of the quantum mechanical activities of these TCP in the presence of TRP. Pal *et al* [20] explained that the universe exists along with the universal consciousness. This universal consciousness functions as a universe wide web (uww) covering the universe as a whole with all its parameters (including void) and inhabitants (with or without consciousness). In this picture, uww of consciousness, quantum concepts like wave particle dualism, position momentum uncertainty, nonlocality and concept of unified field become somewhat understandable as all the entities of this universe are interlinked and intertwined. In this picture, the universal consciousness replaces ether of yesteryears and contains the whole of the universe in its fold.

Consciousness in living organisms is a process which involves the quantum mechanical activities of these TCP and TRP, the ultimate constituents of any matter as well as

any mind in the inherent presence of thought force (T_F) *in vitro* and the thought force (T_F) *in vivo* as indicated by Pal *et al* [20].

The 'spooky action-at-a-distance' is built in nature through the existence of the quantum mechanical activities of these TCP in the inherent presence of TRP. The spooky non-local correlations-at-a-distance might evidence a Holy Ghost at work through the existence of the quantum mechanical activities of these TCP and TRP, the ultimate constituents of any matter as well as any mind in the inherent presence of thought force (T_F) *in vitro* and the thought force (T_F) *in vivo* as indicated by Pal *et al* [20].

6. What is the Exact Definition of Mind? What is Mind?

We observe a great controversy concerning the exact definition of mind. There are two apparently opposite views: one is the substantial view and the other is the functional view.

In the substantial view, the mind is a type of substance. Mind is a finer matter having an autonomous existence. Mind is a single entity, perhaps having its base in the brain but distinct from it. In its most extreme form as in the Indian Upanishads and Vedanta, the mind is not only a finer matter but also it is an entity wholly separate from the body, in fact a manifestation of the soul, which will survive the body's death in the form of the spiritual body or mental body [called Linga Sharira or Sukshma Sharira in Sanskrit] as expressed by Vivekananda [33] who indicated that this mental body bears all the mental impressions. This mental body is also called 'spirit'.

In the functional view, the mind is closely related to the functions of the brain and can have no autonomous existence beyond the brain, nor can they survive its death. In this view, mind is a 'state' created by the activities of the brain with other parts of the nervous system as it is indicated by cognitive neuro-scientists and Artificial Intelligence (AI) scientists. According to them 'minds are simply what brains do'. In this functional view, mind is a subjective manifestation of consciousness: the human brain's ability to be aware of its own existence. The concept of the mind is therefore a means by which the conscious brain understands its own operations.

The modern cognitive neuroscientists generally accept the fact that the "mind" is not an isolated entity and the mind is a state created by the activities of brain with other parts of the nervous system (CNS, PNS along with ANS). Although the mind is generally accepted to be an abstract having no spatial location or public observability, yet it is a type of fine matter according to the ancient Indian Upanishads and Vedanta. The Vedanta indicates that the universe exists along with the universal consciousness. Pal *et al* [18, 20] explained that this universal consciousness is a functional state of the Universal Mind (UM). This UM is constituted by these TCP and TRP which, in turn, are the ultimate

constituents of any matter and any mind in the inherent presence of thought force (T_F) *in vitro* and thought force (T_F) *in vivo*. It is to be noted that these TCP and TRP are the ultimate constituents of any matter in the inherent presence of thought force (T_F) *in vitro*. And these TCP and TRP are the ultimate constituents of any mind in the inherent presence of thought force (T_F) *in vivo*. Pal *et al* [18, 20] explained that any matter as well as any individual mind is constituted by these TCP and TRP in the inherent presence of Thought force (T_F) *in vitro* and Thought force (TF) *in vivo*.

Modern Scientists are not yet able to understand how the brain works to make the mind. They know that brain has got neurons that communicate across synapses by releasing a neurotransmitter, and that generates electrical impulses, and the receiving neuron then talks to its neighbor neurons the same way. If the mind depends on the brain, then all aspects of the mind are going to depend on these simple electrical, chemical processes. According to this concept, the existence of the UM requires the existence of the universal brain to form the UM. The concept of universal brain is not logically acceptable. Thus the concept that the mind depends on the brain becomes questionable if the existence of the UM is valid.

6.1. It appears that scientists would have to decide in a purpose to conclude clearly whether mind is a 'state' (created by the activities of the brain with other parts of the nervous system as it is indicated by the functional view of mind) or 'a finer matter' (as it is indicated by the Indian Upanishads and Vedanta).

6.2. It has already been indicated that mind is a finer matter. The ultimate constituents of any mind are these TCP and TRP in the presence of thought force (T_F) *in vivo*.

6.3. It has already been shown that the ultimate constituents of any matter are these TCP and TRP in the presence of thought force (T_F) *in vitro*.

6.4. Pal [34] showed the plausible drawbacks of the functional view of mind through an article entitled, "Interpretation of mind and consciousness-----"

7. Time and its possible Relation with Classical Physics and Quantum Physics through the Developed Consciousness Model Involving TCP, TRP and thought Force (T_F) Indicated by Pal [30]

Pal [30] expressed through an article entitled, "Sense of Time and Interpretation of the Evolution of Time": In the theory of relativity there is no unique time, but instead each individual has his own personal measure of time that depends on where he is and how he is moving. Space and time are dynamic quantities and they not only affect but also are affected by everything that happens in the Universe. Hawking [21] mentioned, "Time is not completely separate from and independent of space, but is combined

with it to form an object called space-time".

According to the Einstein's theory of relativity, there is no unique "absolute time", but instead, each individual has his own personal measure of time that depends on where he is and how he is moving. It is therefore concluded that time can expand or contract as it is expressed by the world famous "Twins paradox" which runs like this: Keeping one of the twins on the earth, if the other fellow goes for a trip in a space-ship at nearly the speed of light, then, after returning from his space trip, he would see that he is much younger than the one who was staying on the earth. The explanation that is usually given for this expansion or contraction of time is that the time should run slower near a massive body like earth. This is due to the fact that when light travels upwards crossing earth's gravitational field, it loses energy and thus its frequency goes down, as the energy of light is directly proportional to its frequency. It would thus appear to someone high up that everything down below is consuming longer time to happen. Among the surprising effects of relativity are that a moving clock runs slower than a clock at rest, and that time in a mountain top runs faster than time at sea level, because gravity is stronger at sea level and gravity slows time down. This phenomenon leads to the "Twins paradox" if one has the idea of "absolute time" at the back of one's mind as it is mentioned by Hawking [21].

The nature of time's arrow has been discussed by physicists, philosophers, sages and charlatans but there is no agreement. The world of atomic particles shows us that there is really no time's arrow at the quantum level. "Time" itself loses its meaning, and at the Planck scale the words "before" and "after" are without application as indicated by Wheeler [35]. [Planck length = $L = (hG/c^3)^{1/2} = 4.04 \times 10^{-33} \text{ cm}$].

Wheeler [35] pointed out, "Three-dimensional geometry carries information about time [Wheeler et al [36]]. The geometry is not deterministic, even though it looks so at the everyday scale of observation. Instead, at microscopic [or Planck length = $L = (hG/c^3)^{1/2} = 4.04 \times 10^{-33} \text{ cm}$] scale, it "resonates" between one configuration and another and another. The $^{(3)}G$'s with appreciable amplitude are too numerous to be accommodated into any one space-time. Thus the uncertainty principle declares that space-time is only an approximate and classical concept. In reality there is no such thing as space-time. "Time" itself loses its meaning, and [at the Planck scale] the words "before" and "after" are without application".

This is due to the fact that approximately 10^{15} times Planck length ($\approx 4.04 \times 10^{-33} \text{ cm}$) is required to arrive at the radius ($= 8.28 \times 10^{-18} \text{ cm}$) of a TCP. It is to be noted that the theoretically calculated radius of a TCP or TRP within a nucleon $= 8.28 \times 10^{-18} \text{ cm}$. It has already been mentioned that the quantized energy (ϵ_T) of TCP is responsible to cause the generation of consciousness. And further there is no manifestation of 'time' unless there is the generation of

consciousness = $\mathcal{E}_T = m_T c^2 = hc / \lambda_T$ (where m_T = quantized mass of the TCP, c = free-space velocity of light, h = Planck's quantum constant, λ_T = wavelength of the TCP).

The manifestation of any type of "time" is solely dependent on the manifestation of "consciousness" (\mathcal{E}_T). The concept of personal time (psychological time) begins to a person at the onset of the function of his or her "conscious mind" only. 'Time' is bound to the mind in the presence of consciousness. Even the existence of cosmological arrow of time is also dependent on the existence of universal consciousness that, in turn, is the functional state of the universal mind. And the quantized energy (\mathcal{E}_T) of TCP represents universal consciousness.

Consciousness is the functional state of mind. Presence of consciousness signifies the presence of mind and vice versa. It is to be understood that consciousness is the realization of existence and consciousness moves up and down on the 'scale of the realization' of existence through the 'sub-conscious', 'conscious' and 'super-conscious' states as indicated by Pal *et al* [2005]. There is another term called unconscious state. The most usual unconscious state is sleep. A deeper form of unconsciousness is called a coma.

As 'time' is solely dependent on the manifestation of consciousness (\mathcal{E}_T), so time is absent to an unconscious person. Thus time is absent to a sleeping person. Similarly, time is absent to a person in coma state.

8.1. Pal [30] Showed that Mind is Constituted and Operated by these TCP and TRP

As per Georgiev [37], our mind operates at 100GHz (dynamical timescale of 10 picoseconds) where 100GHz = 10^{11} Hz and 10 picoseconds = 10^{-11} sec. It can be shown that the calculated frequency of TCP = 0.6612×10^{11} Hz that agrees well with 100GHz (= 10^{11} Hz). And the calculated time period of the TCP = 1.51×10^{-11} sec that is equivalent to 10 picoseconds = 10^{-11} sec. It is thus apparent that there is a remarkable relationship between the operational mind and the quantum mechanical activities of these TCP and TRP with which every mind is assumed to be constituted. Thus our assumption that mind is constituted and operated by these TCP and TRP is found to be correct through these propositions and experimental observations.

At the onset of the Big Bang, the time as well as space is generated along with the universal mind (UM) with the universal consciousness (see Scheme-I). Thus, at the onset of the Big Bang, the time is generated along with the space which itself is gradually taking its own usual characteristic 'shape' to accommodate subsequently the formation of matter within itself by the projection and activity of TCP and TRP in the inherent presence of thought force (TF). This thought force (TF) is an expression of the universal consciousness that, in turn, is the quantized energy (\mathcal{E}_T) of TCP.

The TCP in the inherent presence of TRP plays the fundamental role for the initiation of consciousness ($\mathcal{E}_T = m_T c^2 = hc / \lambda_T$) through which the evolution of light (at the Big Bang) and its velocity (c) can be realized. Thus, the apparent origin of the physical time appears to be the origin of evolution of light and its evolved velocity (c) at that point of the beginning of the universe.

Light travels fast and far, but even the light stops at a black hole. A black hole is a star that is so massive that it collapses to a practically no volume under its own gravity. The gravitational force in a black hole is so intense that even light cannot escape from it. It is to be noted that time (as well as space) becomes zero at the inside singularity of a black hole. The origin of the physical time thus appears to be related with the origin of the evolution of light and its evolved velocity (c). Thus, the velocity (c) of light as well as time is always related with consciousness = $\mathcal{E}_T = m_T c^2 = hc / \lambda_T$. And the consciousness is thus conjectured here to be the 'mental light'. It is to be noted that \mathcal{E}_T is found to be directly proportional to c (free-space velocity of light) where the proportionality constant, $K = h / \lambda_T$ (where h is

Planck's quantum constant = 6.63×10^{-27} erg .sec, and λ_T is the wavelength in cm of TCP).

8.2. Pal [30] Showed that Time without Consciousness is not Possible

Time of any kind cannot exist without the existence of consciousness. Time without consciousness is not possible. But consciousness without time is possible. That is why Georgiev [37] pointed out, "Consciousness is possible without perception of time." It is really very difficult to understand the fact that consciousness alone can exist independently without perception of time. Consciousness can exist independently in the form of super-consciousness, a state that is usually enjoyed and experienced by a real 'YOGI' (who practises meditation). In the super-conscious state, the perception of time becomes zero. It also indirectly signifies the existence of consciousness prior to space, time, and substance. It thus indicates the existence of the universal consciousness that, in turn, exists along with the universe, thereby, proving the fact that consciousness, not matter, is the ground of all existence.

Consciousness, not matter, is the ground of all existence, declares University of Oregon physicist Goswami [6] through his published (1993) book, "The Self-Aware Universe: How Consciousness Creates the Material World". He accepts the Vedantic view and holds that the universe is self-aware, and that consciousness creates the physical world. Matter is an expression of mind, not separate from mind, but mind manifested materially.

It is evident that when we remain vigorously absorbed in some kind of deep thought or when we remain in the exulted ecstatic mood (thereby existing within the high energy level mentally and internally) being vigorously

involved with the beloved persons, then we feel that the time runs very quickly. In other words, the personal concept of time is contracted as the intensity of the field of energy is increased as indicated by Pal [30]. On the other hand, the time appears to run very slowly (that is the time is expanded) when we fall in the distressed and hopeless condition in which we remain within the exhausted energy level mentally and internally. Thus whenever we remain in the state of high concentration of mind, thereby existing within a high energy level mentally and internally, we usually forget the existence of time. Time is contracted ultimately to zero. We then forget the existence of time altogether, although we are not really conscious about the intrinsic meaning of this vanishing of time and re-appearing of time.

9. Interpretation of the Reversal of Time through the Speed of Mind

Energy-matter variability of the Special Theory of Relativity gave a good impetus to develop a mathematical model for consciousness through the postulated TCP and TRP, but its rigidity in the constancy of the velocity of light may prove that Relativity will be found wanting to attest the whole truth of the laws of consciousness, since it seems 'mind' possesses a velocity faster than all conceivable velocities including that of light.

Special theory of relativity predicted a limited form of time travel because it showed that time is not absolute and universal, but dependent on an observer's state of motion. Thus, two observers moving at different speeds will measure different time intervals between the same two events. Although the theory of relativity does not precisely show or prove that backwards time travel is possible, it does not deny the idea either. In fact, if an object were to travel faster than the speed of light, then it would be able to travel back in time.

It is our view that Astronaut Neil Armstrong can, within a flash (fraction of a second), visualize in his mind that particular portion of the surface of moon at which he landed his space-ship. It means that he is, as if, present mentally on the surface of moon instantaneously by directing his mind although he is not moving physically. It can be expressed as a mental time travel. It is to be noted that the time required by the light to reach on the earth from the moon is around 1.28 seconds, traveling at the speed of 1,86,000 mile or 2,99,793 Km per second in the vacuum. This indicates that the speed of mind is higher than the speed of light. Here Neil Armstrong is not moving physically but he is memorizing (remembering) the past event by directing his mind to recollect the previous events existing physically at present.

It is, thus, apparent from the above fact that the mind can travel faster than the speed of light. This idea goes against the fundamental requirement of Einstein's theory of

relativity, which confirmed that any normal object is always confined to move at the speed slower than the speed of light.... it can never cross the speed of light. Thus, ETR (Einstein's theory of relativity) is not valid on the function of the mind which itself is a kind of finer matter (being composed of and operated by the postulated TCP and TRP) and which can travel faster than the speed of light.

It is to be noted that although it is assumed that these TCP and TRP exist in the universe to behave, in general, like photons or bio-photons as indicated by Pal et al [20] for causing the universal consciousness as well as the Cosmic microwave background radiation (CMBR) temperature, yet they may be mathematically allotted a mass (m_T) equivalent to $4.871 \times 10^{-37} \text{ g}$ to $5.5 \times 10^{-37} \text{ g}$.

It is also indicated by ETR that, if it is possible to cross the speed of light, then the events will start to appear reversibly, meaning thereby that events will start to begin from the 'end' and will end at the 'beginning'. This truth can be verified by directing the mind to flow backward in time. The meaning of 'memory' is to read it in mind. To remember a thing is to read it in mind. We are able to remember the past through the activity of the mind. 'Previous events and affairs can be remembered' means that they can be read in the mind by directing the mind to recollect the previous events existing physically at present. This backward mental flow of 'time' is possible to be caused by the function of mind which can travel faster than the speed of light, thereby proving the truth that the 'reversal of time' is possible by crossing the speed of light. This affair of remembering the past events in the mind existing physically at the present moment is also another proof that the mind can travel faster than the speed of light.

10. Discussion

Pal [17] explained the testability for the existence of TCP and TRP along with the Thought force (T_F). Pal [38] has also published an article on time: "Relation of Space-Time Continuum with Energy in the Presence of Consciousness and Super-Consciousness".

11. Conclusion: Mental Time Travel

It is shown here that mental time travel is possible due to the fact that time is bound to the mind in the presence of consciousness. Sean Polyn [39] and a team of Princeton researchers showed that when people remember past events, they actually recreate their brain state as it was at the time the event occurred. "When we think back to the past, each detail that we remember triggers another until a memory returns completely," Polyn [39] said. "I guess in that sense, memory retrieval is like revisiting the past. Brain patterns that are long gone can be revived by the memory system. When we try to remember something, we do mental time travel".

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