Time Travel and Consciousness

Is time travel possible? Both Einstein and the Vedic literature have an answer.

By Sadaputa Dasa

IN 1898 H.G. WELLS published his famous story of the time machine—a machine that would enable a human time traveler to visit any desired time in the past or future. We have no idea how this fictional machine might have worked, but people have spent a great deal of time and effort to see if traveling through time might actually be possible. It turns out that some forms of time travel were contemplated in the Puranic traditions of India, and that empirical evidence pointing to possible time travel can be found both in modern physics and in the study of paranormal phenomena.

What is time? Generally we think of time as passing or flowing from past to future. We think that the future has not yet come to be and the past has ceased to exist. Only the present is real, and that reality shifts from moment to fleeting moment. So where can a time traveler go if only the present exists?

Einstein's special theory of relativity provides an answer to this question. To see how, consider a diagram in which space is represented by the x-axis and time is plotted on the vertical axis. A horizontal line at a certain level represents a given moment of time, with the future above the line and the past below it. In Newtonian physics, if an observer moves uniformly relative to us, a moment of time for that observer is still represented by a horizontal line. But in the theory of relativity, a moment for a moving observer is represented by a tilted line that partly lies in our future and partly lies in our past. This implies that our past and future must be real since they lie in the present of various moving observers. As Einstein put it when consoling the widow of a deceased friend, "For us who are convinced physicists, the distinction between past, present, and future is only an illusion, however persistent."

Thus the special theory of relativity implies that all moments of material time are, so to speak, frozen in timeless existence. This may make it hard to understand the apparent passage of time, but it does provide places for time travelers to visit.

Einstein's special theory of relativity was followed by his general theory of relativity. The general theory not only allows destinations for time travelers, but in principle it allows for pathways they might follow to reach these destinations. For example, the famous mathematician Kurt Godel once used Einstein's theory to formulate a mathematical model of a rotating universe that allowed closed timelike loops. These are paths through space and time in which the direction to the future curves around so that the future merges with the past. If one could follow such a path in a spaceship, one would eventually loop back into one's own past.

Paradoxes of Time Travel

When we contemplate travel from the present to the past, we immediately run into paradoxes or contradictions. For example, there is the famous grandfather paradox. If a traveler goes back in time and kills his grandfather before his grandfather meets his grandmother, then the time traveler will never be born and therefore cannot kill his grandfather.

One way to deal with such paradoxes is to introduce multiple universes into the picture. Suppose that when you go back to kill your grandfather, you kill him in a parallel universe that is nearly the same as this one but contains a deceased grandfather rather than a living one. We can eliminate contradictions by allowing events altered by time travel to work themselves out in various parallel universes. This can be done in the context of the "multiple worlds" (or Everett-Wheeler-Graham) interpretation of quantum mechanics, in which the universe continually splits into multiple copies corresponding to the different possible outcomes of random quantum events. The quantum physicist David Deutsch developed a theory of time travel along these lines.

All of these ideas about time travel are set in the context of the theory of relativity, which posits a static space-time world in which there is no passage of time. If the passage of time is truly an illusion, then the question arises of who or what is deluded. This leads to two questions: What is consciousness, and How does consciousness fit into the space-time picture?

Many scientific discussions of consciousness assume that consciousness is "nothing but" patterns of matter in the brain, involving neurons, synaptic connections, and various kinds of molecules. However, philosophers such as David Chalmers of the University of Arizona have argued that such ideas avoid the "hard problem of consciousness," which is to explain how it is that we have experience at all. Consider a person looking at an apple and experiencing the redness of its surface. What is this experience of redness? Complex patterns of electro-chemical reactions may be manifest within the brain, but this tells us nothing about experience. After all, most brain activity occurs on a completely unconscious level. Why does any of it give rise to experience?

Chalmers proposes that in addition to material interactions there is an element of conscious experience that cannot be understood in material terms. He argues that even though conscious experience is not reducible to matter, such experience is linked in a one-to-one fashion with high-order cognitive processing in the brain.

Let us pursue Chalmers's idea. Although conscious contents may correspond to abstract patterns in the physical body, they clearly correspond only to a small and varying subset of these patterns. There must therefore be some agency that chooses this subset and keeps consciousness linked to it during the period of conscious bodily activity. This agency cannot be strictly material, since it links something non-material with something material. Thus we can formulate the connection between consciousness and matter as:

Consciousness (agency) Material patterns

Many spiritual traditions have taught that consciousness (the cit potency in Vedic teaching) is beyond time. According to the theory of relativity, matter exists as a time-less pattern in space-time. Thus the agency in the above formula links two timeless entities, consciousness and matter, and causes conscious entities to experience events in time.

We can see how this might work by studying a well-known example of time travel. Imagine two twins. One twin stays on the earth, while the other travels into space on a rocket at nearly the speed of light and then returns. We observe that the twin on the rocket has experienced less time than the one who stayed home. Thus the traveling twin could experience a trip of, say, one hour and return to earth after a period of millions of years of earth time.

The difference between the two twins is that one of them accelerated in the rocket, whereas the other did not experience this acceleration. The physical interactions in the traveling twin's body follow the same pattern as those in the body of the stay-at-home twin, but the motion of the rocket causes them to be stretched in space and time. If the hypothetical linking agency is concerned with the patterns of events while ignoring the stretching, then we would expect the traveler's consciousness to be similar to that of his sedentary twin but stretched over a long time span.

In the twin paradox, time travel into the future was achieved through the motion of the rocket. A similar time distortion occurs in a gravitational field. Imagine that one twin stays far away from a very massive planet, while the other twin travels close to it and comes back. Here the traveling twin will experience a shorter time interval than the twin who stayed away from the planet.

King Kakudmi's Journey

An interesting story in the *Bhagavata Purana (Srimad-Bhagavatam)* parallels this form of the twin paradox. In this story, a king named Kakudmi visited the planet of Brahma and waited for a musical performance to finish before having an audience with him. Brahma told him that while he was waiting, 27 x 4,320,000 years had elapsed on earth and the king's civilization had completely passed away.

In another story, Brahma visited the earth to steal Krsna's cowherd friends, went home for a moment of his time, and then returned. One year had elapsed on earth. A "moment," or *truti*, is 1/33,750 of a second, according to the *Surya-siddhanta.* On this basis, an earth year is 1/33,750 of a second of Brahma. The number of Brahma's seconds in 27 x 4,320,000 earth years should come to 27 x 4,320,000 133,750 = 3,456 seconds, or nearly one hour. Thus the two stories are consistent, since a musical performance could easily be about this long.

If consciousness is "glued" to patterns of events in fixed space-time, then it would appear that all events are determined and there is no possibility of free will. It turns out, however, that if purely random events can be reconciled with fixed space-time, then so can free will. We have seen that a random event can be represented as a splitting of the universe into two or more parallel universes in which the various random alternatives are manifest. According to quantum theory, vast numbers of random events are always taking place, and thus the universe must be continuously splitting into vast numbers of divergent copies.

This scenario also allows for free will. At a fork in the universe, the conscious entity has the opportunity to make a choice between alternative courses of events. If we posit that conscious entities have the innate power to make such choices, then they will be able to act according to their will within the framework of physical circumstances determined by the laws of physics and their previous choices. Life histories develop as tracks through branching patterns of space-time. If a given timeless conscious entity is connected to a particular path through the fixed space-time tree, then the entity will experience events consistent with the passage of time at each moment along its path. This will create the persistent illusion of time's passage mentioned by Einstein.

Going Back in Time

Travel into the future is possible according to modern physics, but travel into the past is more problematic. Godel's rotating model universe is quite different from our own, and closed timelike loops are difficult to bring about in any universe obeying known physical laws.

One possibility is to send messages into the past instead of actually traveling there physically. Scientists have examined various ways of sending a signal into the past, but unfortunately none of them seem feasible. Ironically, however, there is a kind of signaling into the past that has been observed empirically but is not accepted by mainstream science.

This takes place in what is known as precognitive remote viewing. In a remote-viewing experiment, one person (the percipient) stays in a room and tries to describe what is being seen by another person (the agent), who has traveled to a remote site. Thousands of experiments of this kind have been performed. For example, at Princeton University an extensive series of successful remote-viewing experiments was carried out under the direction of Robert Jahn, one-time head of the Princeton School of Engineering. The surprising feature of these results is that percipients were able to obtain information equally well from the past, present, or future—an ability known in Sanskrit literature as *tri-kala-jna* ("three times knowing").

In summary, the idea of time travel can be consistently developed in the context of the theory of relativity and the many-worlds interpretation of quantum mechanics. At the same time, the theory of relativity provides a framework for understanding how timeless consciousness and the timeless physical continuum could be linked to allow for the experience of time. The many-worlds theory, in turn, reconciles Einstein's timeless space-time with random events, and a similar reconciliation (in which free choice selects branches) provides a way in which free will can operate in a world obedient to physical laws. So by exploring the idea of time travel, we are led to an understanding of more fundamental issues involving consciousness and matter. As a final note, the phenomenon of remote viewing suggests that time travel may be more than just an idea.

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