Research paper on time travel

Sport & Tourism

Introduction

The subject about time and how time travels is really very fascinating. What is time? What is time travel? Is time travel really possible? We naturally know what time is since we sense it every day but we cannot seem to completely define it. The question of time travel is also very hard to answer. A deeper question is to ask if time is real. Another is to know if time just moves into one direction only. Does time have a beginning or an end? Up to now, we have never truly answered these questions with great satisfaction. By merely inquiring into these puzzling questions stretches our heads and shakes our beliefs and general points of view. Similarly, these long-time questions have confused scientists, philosophers, mystics, etc.

Time is commonly known as what the clock tells. It is actually a segment of the measurement system used to sequence events, to make a comparison of the duration of an event and their intervals, and it is also a way to quantify the movements and the rates of movements of objects in motions (Davies 14). A division of time according to the past, present and future is also sometimes surreal. The temporary conditions relative to the present moments are ever changing. As the old saying goes, you can never step the same river twice. It means that one instant, the river has changed and so does the individual who stepped into it. This goes to show how dynamic time is. Things happen and they are all relocated in the history of the sequence of the past.

Time has also been central to various religions and cultures of the world (Davies 23). Time is also a controversial matter for science and philosophy. Presently, physicists would agree that time is still one of the mysterious

elements of the universe (Rosenberg 421). To define time is to face the most elusive subject whose complete definition would end all the debates of all fields of studies.

Time travel, on the other hand, can be simply explained as the “ concept of shifting between two varied points in time in a similar manner that points move in different space” (Prucher 230). In hypothetical terms, time travel consists of moving back to the past or into the future, without the intervention of the persons and events involved in the past and in the present and future. Time machine is the term used to describe the technological device that is the vehicle for a person to travel through time (Rosenberg 231).

The History of Time as Discovered by Scientists

The fields of physics were primarily gathered from astronomy, optics and mechanics. These fields were all drawn together and unified by geometry (Singer 35). During the 17th century, natural philosophers confronted academic foundations of knowledge and recognized mechanics and astronomy as more universal and valid studies of motion. Galileo Galilei initiated his studies and contradicted Copernican theory of the relative motions of the planets, the suns and their satellites. Galileo did mechanical experiments and asserted that motion itself carries consistent and universal characteristics which are mathematically defined (Biagioli 25).

In the later part of the century and into the 18th century, Isaac Newton also contradicted the Descartes’ Cartesian mechanical tradition. As a physicist, Newton defined universal motion as a function of the basic principles of mathematics. He introduced his ideas through his three laws of motion and

the law of gravitation in his 1687 work Mathematical Principles of Natural Philosophy (Biagioli 30).

While the study of time became rigid during Galileo and Newton's time, a more comprehensive theory was derived by Albert Einstein after two centuries (Singer 29). The Jewish physicist interpreted time as a rotation of the clock or a sand falling inside the hourglass. He proposed the idea that type can be warped and that it is not stationary. It defies the Newtonian law of absolute space and time. Space was not fixed, finite, moving metric against which fixed motions could be referred to in measurement. These ideas were all challenged by Einstein.

The Theory of Relativity by Albert Einstein

Einstein has reinforced the connection of time and space and this was summarized in his theory of relativity. According to Einstein, the definition of time depends on the context of the observer. His reference of time, such as the clock, is also dependent on the relative motion of the observer. Einstein said that the past can be sent to the observer through light signals (Moring 12). In the same manner, the future is plainly a set of events to which the same observer can send light signals.

This Theory of Relativity was proposed by Einstein in the initial part of the twentieth century. It has become one of the highly influential scientific discoveries of all times. While the earlier physicists and scientists have established the foundations of relativity, it was Einstein who identified that there is a physical limit in motion and this can be constantly and absolutely measured through the speed of light (Moring 13). This is measured in a vacuum. Einstein's theories have greatly influenced scientific research and

discoveries. It is highly regarded over recent years as exact explanations to phenomena. The predictive power of his theory is very significant.

In our common lives, we seem not to be influenced by this hypothesis because we do not travel in light speed. However, for objects moving fast near the speed of light, just like the bullet train, the theory of relativity asserts that these will move more slowly and will be shorter in length from the observer outside the train. Since the light speed is constant, this implies that the observer outside the train saw the light take twice as long to reach the mirror. Simply, the observer assumes that time is quicker inside the train. This is because there is greater gravity outside.

Another simple explanation to his theory is that a clock on the ground floor of the Empire State building will tick faster than a clock on the highest floor of the building since gravity causes clocks to run slightly slower. Thus, a clock that is further away from the center of the planet will run faster, proving that time is relative to the observer.

As observed from a gravitational field, Einstein’s theory introduced the concept of " curved space-time continuum" (Moring 13). This shows the aspects of time and space composes a two-dimensional plane where large objects create holes in the surface. This part of Einstein’s relativity theory explains the bending of light phenomena circling the sun. It gave rise to the concepts of black holes and Cosmic Microwave Background Radiation (CMB) (Moring 13).

Einstein: Father of Modern Physics

Albert Einstein’s theories challenged the field of Physics who heavily leaned on classical mechanics as supported by Newton’s Laws as well as the works

of Hamilton and Lagrange (Openheimer 8). People instantly accepted these explanations because it is more logical to view things as static or in motion. Hence, the publications of Einstein’s papers in 1905 made a powerful stir in the scientific circles. It has been fundamental to a whole new discovery in physics, in general. The theory of relativity led to new theories and findings in modern times. Hence, Einstein opened up Modern Physics. He became the Father of Modern Physics (Schweber 5).

His early contributions to Physics started in 1905. It impressively resulted into the following: theory of the Brownian motion in molecule terms; theory of the photoelectric effect in quantum terms; and the special theory of relativity that connects time to space and energy to matter. From 1907 to 1915, Einstein developed general relativity, a theory of gravity. He also worked on the theoretical basis for the “ teleportation of photons (Openheimer 9). His final work was an attempt to unify electromagnetism and gravity into a single unified field theory, still an active problem of physics. Einstein's work also had a great influence on quantum theory, nuclear power and the creation of an atomic bomb. Einstein was bestowed the Nobel Prize in 1921 for his work on the photoelectric effect (Openheimer 10).

Einstein overwhelmed the world when he discovered that E= mc2 – this formula states that energy and mass (the potential to do work and the element to do work with) are the same (Openheimer 10). With his strong theory, Einstein contradicted the concept of time as constant. He asserted that time can be expressed in various ways, depending on one’s perspective.

Is Forward Time Travel Possible?

The literature and movies are filled with the stories of time travels. Yet, we ask seriously if this is possible or not. If it is possible, how does someone travel in space and time? Time travel is said to be possible if an object travels at higher speed. This implies that if an individual were to travel into outer space and return, moving nearer to light speed, he could travel thousands of years into our planet's future.

According to Gribbins, physicists have found the law of nature which contradicts the paradoxes of time travel (1). Hence, they assert that time travel is possible. It cited an understandable theory that underpins the quantum theory. It was theorized by Richard Feynman fifty years past. It asserts that time travel is possible, provided that light travels in straight lines.

Scientists also agree that time travel is not contradicted by any laws of relativity. The most popular form of time travel is through the speed of light. This is done by multiplying data or matter faster than the speed of light (Salters 302). Another common means for time travel is the wormhole (Bonsor & Lamb 1). It is described as a tunnel through space and time. A wormhole links various regions of the Universe, different spaces and times. The two openings of the wormhole could be placed parallel in space next but divided by their respective times, and thus can allow time travel. Scientists say that this is difficult to build because it would involve forcing the black holes to merge. However, they also say that this could naturally occur. Another means is through cosmic strings. These strings may weave throughout the whole universe. Since they have gravitational pull, they can pull anything near them and allow an object (or person) to travel through

time at the fastest speed. By pulling two cosmic strings very near each other or by stretching one string at a tail of a black hole, this can also allow time travel (Bonsor & Lamb 1).

The Impossibility of Turning Back Time: The grandfather paradox

The Grandfather's Clock is a theory which renders backward travel of time impossible (Rosenberg 10). The paradox is that, for instance, if you travel backwards in time through a time machine, you would meet your grandfather. If you happen to kill him by intention or accident, then, he could not have bore any offspring. This means also that you will not be born into the future (or the present). Thus, there is a paradox in backward travel in time. It also means that the creation and use of the time machine is not possible.

The grandfather paradox was first described in 1943 by the science fiction writer Rene Barjavel in his book Le Voyageur Imprudent (Future Times Three) (Rosenberg 10). The contradiction brought by this hypothesis implies that a rational ground refutes the backward time travel. Hence, the consequences of the present or future cannot be remade in the past or else a completely new picture is created.

According to Stephen Hawkings, the most famous physicist, it is impossible for time to move backwards because it " violates a basic rule that cause comes before effect" (" Time travel possible, but only moving forwards, says Stephen Hawking").

Can the Present Technology Enable Time Travel?

Various discoveries lend themselves strongly for and against the possibility of time travel. According to some physicists, the ultimate speed limit for the packets of light called photons might be beaten and hence, make time travel impossible (Gribbins 1). Experiments in the last few years suggested that a unitary photon may not be able to overcome the speed of light. Scientist further showed that a single photon is too limited to the vacuum speed limit (Gribbins 1).

The principle of casuality is represented by the photons, as articulated by Albert Einstein in his works (Gribbins 1). It only shows that an event's effect cannot preceed its cause and thereby does not allow time travel. Unless, of course, this principle is violated and in that case, the casuality is not followed either by chance or by a sweep of motion.

If technology could defy this casuality, perhaps, time travel is possible. Scientists need to discover how to vary the speed of light to propel a vaccum's limit. There is a great possibility for time travel. Otherwise, there is no hope for time travel.

For instance, scientists at the Hong Kong University of Science and Technology have successfuly measured " optical precursor" (Gribbins 1). These precursors are the waves that precede photons in a material. They can now be observed for a single proton. They have shown that the optical precursor and the photon that carried it are really limited to the vacuum speed of light. This result implied that time travel is really impossible.

On the other side of the equation, it also shows the many possibilities of how scientists can go beyond this said limitation and worked their way towards propelling the single proton against its vaccum limit. This requires more

studies in the transmission of quantum information (Gribbins 1). Hence, time travel is also possible. As Hawkings asserted, humans has the full capability to travel through time.

Several time technologies which we have now include the following: Quantum Tunneling; Faster-than-Light Travel; Circulating Light Beams; Alcubierre Warp Drive; Near-Lightspeed Travel; Cosmic Strings; Tipler Cylinder; Wormholes, Casimir Effects, and Time-Warped Fields (Existing Time Travel Technology). The true test of these technologies is if they can actually send someone in time travel. Perhaps, it is just a matter of time that the technology will be able to enable time travel, as we have also launched spaceships into the outer space.

Conclusion

The idea of time travel is very fascinating. The concept of time is also very intriguing. These two concepts defy both the principles of science and philosophy and even religion. However, this has been only realized in novels and in movies. Can we really be successful in pursuing time travel?

The theory of relativity renders itself most useful in defining the concept of time and space. However, its complicated formulas cannot be made practical yet, as no one has actually gone far beyond space or time to warp time or manipulate a wormhole. The more important realization about time is that it is highly relative, thus, its meaning depends on each one of us.

We can only hope for the best of the future but we cannot defy gravity or any of the physical laws that infinity puts the blanket of time to hide some of the most mysterious things of the universe.

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