

The Universe is a Constantly Changing, Diaphanous Boundary of the Present, Between the World of Infinite Possibility and the Non-Real Past

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August 31, 2012

Abstract

Much thought concerning the nature of our universe with respect to the past, present and future, treats time as mathematically reversible in direction or as simultaneously and forever existent in a pure block universe, with intact pasts and futures that can be visited under appropriate conditions. It is proposed that our universe is a finite and constantly changing diaphanous boundary universe (DBU) of the present, engaging a larger non-real world of infinite potential from which this boundary is fueled. The diaphanous boundary universe of the present is the gatekeeper of reality, which evidences reality from within an infinite range of outcomes or possibilities in the greater world. All events have an occurrence of one and are therefore non-existent once they occur, except that all event information is retained in the present which informs the boundary regarding what future possibilities may occur. There are no fixed physical laws in the universe because the boundary is changing, altering its own nature and how it selects from future possibilities, creating the next now with new realities drawn from the infinite potential of the greater world. Time is absent from the structure of the universe except as an essential artifact within consciousness, which allows life to engage time with space in order to experience the interconnections and causal relationships of past, present and future.

1 The infinite world and the diaphanous boundary universe

The world is defined as un-real, dimensionless and infinite potential within and beyond the universe. The finite universe that we experience is within the world, but the world is infinite possibility from which the changing universe draws upon. The observed actions of quantum mechanical behavior are a revealing glimpse into the interface of the boundary and the world. Quantum mechanics operate between the DBU and the world of infinite possibility. We can never directly observe the world, only the creation of reality within our own present in the universe. The world is analogous to the implicate order of Bohm [1], in that it is intrinsically deeper than the observable universe, or explicate order, and yet the universe is inseparable from it. But rather than reality periodically rising up from a deeper order, as in Bohm's oil drops in the spinning glycerin cylinder, I propose that the world consists entirely of infinite possibility, which becomes real in our universe. This process corresponds to the collapse of the wave function, wherein possibilities and uncertainty are concretized. The universe is superimposed on the world, but the world is non-real and beyond the universe.

Defining the universe as a diaphanous boundary is acknowledging the point-of-no-return aspect of all possible alternatives on the path to reality. At the quantum level, the collapse of the wave function permits the observation of outcome. But we experience this brink at every level of our existence. It forms the basis of our plans and decisions, our anticipations and our deadlines. If we are driving down the road heading for a fork, or moving within the trunk of a pair-of-pants-shaped space or decision, we know that choices loom ahead. We can contemplate the alternatives, stress over the choice, even trick ourselves at the last moment and go the way we didn't intend to go. But eventually we reach the diaphanous boundary of decision. Irrespective of our freedom to select A, B, or other, we know it's reckoning time. This experience echoes the curious, weird feel of quantum indeterminacy, when the

cloud of uncertainty becomes real because it must. This diaphanous boundary is the present, the present of our entire universe, the totality of all events in the universe at the point of exact change; the reality built from possibility. The diaphanous boundary is not flat, but rather textured and dynamic, due to advanced or delayed quantum events continually taking place.

The universe is constantly changing. In fact the universe could be defined by change; change is what the universe means. While I am not convinced that change requires a time arrow, the continual change of the universe implicitly requires that an event can never be returned to, that the actions at the diaphanous boundary can never be precisely reproduced. If the future and the past are non-real, then time does not actually pass from the past through the present and into the future. There is only the changing boundary of the present. We cannot return to a past event, a former now, because of the very nature of change; when the universe changes it becomes different and unique, and it cannot un-change or re-copy its previous self.

The past is a far more rococo beast than the future. It appears fairly easy to imagine a non-existent future, consisting entirely of infinite possibility, which also enables our desire to have free will. But does the present turn into the past? And if so, where does it go? Can we go back there? If we examine a particular event that happened, and for which we have abundant information, perhaps we can sort it out.

At one point in the universe, Abraham Lincoln was speaking at Gettysburg. Many witnesses heard his strong voice, clung to his words, felt the breeze and observed the rich intensity of the oratory and the place. An event like this is a real node in the universe, a discrete happening that human senses can devour. And once Lincoln began speaking, there was continual change, and when his lips closed for the last time the event ended. That event is now non-real in our universe. It is not present. We have written records, photographs of Lincoln, personal stories verbally passed down, a myriad of information, and we can still go back to the approximate, although changed, place where the event occurred. But the occurrence is once and gone. However, the entirety of the event information is still with us in the present. The sound energy of Lincoln's voice was transmuted into heat when it struck materials, and the witnesses and their belongings have been converted into other things. Bones are still decomposing. Every bit of information is conserved and is still with us in the present. Even if we cannot access it, it is here.

The present contains 100% of the information of events that occurred, but we cannot have re-occurrence of the event because occurrence is one and is now non-real. The information of the whole boundary of the present is bound to all events, and information about the whole is contained in all of the parts, as in the structure of a hologram. Instead of all matter being built from the bottom up of smaller and more elementary particles, the parts are made of the whole. And if our solar system was consumed in a black hole, presumably 100% of the information of all reality and events would be preserved on the surface.

2 The reality and non-reality of past, present and future.

Great minds have grappled with time, yet time seems even more inaccessible than quantum entanglement and weirdness. In QED [2], Feynman suggested not asking how quantum mechanics can be like that, and focused on using quantum mechanics as a tool to make accurate predictions in nature. But time is intimately wound within our lives, and it must be confronted.

Science and science fiction draw heavily upon our potential ability to travel back to past events and alter our future, or jump to future events to see how things turned out. Despite the fact that much of the mathematics of physics treat time as non-directional, and in spite of recent experiments in backwards causality, our experiences and observations reveal otherwise. It looks and feels like change has one direction only, and the second law and increase of entropy support this. Additionally, in his paper on the flow of time, Ellis [3] describes in detail how the collapse of the wave function into an eigenstate is not

time reversible. The initial state does not provide absolute information regarding the final state, nor does the final state provide completely accurate information about the original state if we are attempting to work backwards to initial conditions.

In a pure block universe as described by Barbour [4], or perhaps Parmenides [5], time does not exist, and the universe is a static series of snapshots which we experience as flowing time. In this scenario, there is no movement, there are no physical laws because nothing ever happens, quantum indeterminacy is nonsense, free will is banished, and the past, present and future become one eternal state with patches of consciousness to enjoy the snapshots. Our physics would thus be rendered errant, striving pointlessly to examine cause and effect of a static system, like wondering how the front of a car created the middle. Change is just a different place on the continuum. The crystallizing block universe of Ellis and Rothman [6] has a directional and changing present which engages a quantum indeterminate and non-existing future, creating a reality at the forefront of a crystallizing, block universe past. In the many-worlds interpretation of Everitt [7], the wave function of the entire universe never collapses, and all possible outcomes are fully realized somewhere, but we unfortunately only get to experience one.

Alternatively, I propose that continuous change fueled by infinite possible outcomes is the process of the boundary universe, but time is not a structural part of this boundary. Time emerges in consciousness. Time allows us to make the boundary of the present fat rather than diaphanous, so that we can experience events of the past in continuity and entanglement with the present, to remember, consider, contemplate and dream, and also allows us to imagine, plan, and predict our future reality. If consciousness did not smear the present with time, all communication would be impossible. We could not understand a word, let alone a sentence or series of symbols conveying meaning, if we were experientially locked within a diaphanous now. We could not compose or appreciate music. Memory and imagination, which manipulate time, elucidate speech and music, or any event that is experienced in the changing present, are essential. This is an indispensable feature of life, the beauty of our minds. Time exists in consciousness, enabling us to actively participate and affect the changing now. Otherwise we would be entirely squeezed out of the narrow boundary of the present.

With time not elemental to the structure of the universe, spacetime is created through the interplay of three-dimensional space with consciousness time. Spacetime arises only through the appearance of consciousness and its facility to employ time. All of the spacetime postulates and mathematics by Einstein and others still hold in the universe, and our human experiences bear this out, but the time component is provided by consciousness. Thus all of our relative personal experiences with time and time dilation are possible.

Another clever trick of the universe is that our senses are relatively narrow in our experience of the world. If we could see the entire spectrum of light, we could not discern or see. If we could hear all frequencies of sound at all distances, we could not hear. If we could feel the pressure of any force, we could not truly discriminate sensations. The fact that every species is equipped with a balanced array of senses unique to that species, and the extraordinary biological diversity of life on earth which advances in an endless series of nows, bear out this fact. In turn, and supported by this limited wealth of senses, it is consciousness that allows the knower to contemplate the universe in time, while also investigating how the knower can know nature and know oneself.

We can more clearly define the difference between the past and present, and a closed event and the present. Very old materials that are present today, such as dinosaur bones, geological formations, stars, or anything else, are not the past. They are part of the continuous present. The events of particular dinosaurs walking, or stone forming, a particular life lived, are forever gone. But whatever is still with us is part of the present. The past is non-real and the events are gone, but the information of the events and the lingering effects and materials, the real components of events, are still present with us. When we look

at a distant star we might say we are looking into the distant past, but this is not so. We are viewing visual information that is still with us in the present, and the star is now in an unknown location in the present. Again, the original event (visible position of star) is erased by change, but we still retain the information in the present and presume that the star is in a current state somewhere else right now.

If the occurrence of an event is singular and gone, then what is special about an event? Why are events a one-time proposition but stuff can hang around in the present? At first consideration it would appear that the total complexity of an event like a speech seems more intuitively un-repeatable than a stone that lies still. Through many nows, the stone appears the same, but we can never find that exact live speech and its context again. But in reality it is just a matter of degree. We can readily observe when the complex event is over, but everything in the universe can be viewed as an event as well. Although it would take very fine examination with instruments to determine how much a stone has changed, it has in fact changed. The pace of change is slow compared to human interactions. But from the movement of light to the movement of creatures and materials, down to a crystal buried in the earth, everything is changing. We cannot return to any events. When I return with my son decades later to sit upon the huge rock in front of my childhood home, it appears exactly the same as before. But the rock has changed, it's the rock of now, and we can never re-visit the rock in the original state when I was seven years old. It was slightly larger and heavier, marred and soiled in a different way, and millions of miles away.

It has been the revered goal of mystics in many cultures to attain a state of consciousness that is outside the normal reality of smeared past, present and future. Their goal, as illuminated in the Upanishads and other ancient texts, is to reach the tranquility of now, without the noise of language or other mental distractions, without memory or contemplation of the past, without examination of the present or imagination of the future. They are seeking to quiet the extraordinary activity of consciousness. There is a place that can be reached inside oneself, where time is eradicated entirely, and the self is fully immersed in the entire continuous present of the universe. The fact that this state of mind can be attained, or nearly attained, is striking evidence that consciousness time, with all of its astonishing capabilities, is the source of our mistaking the past and the future as real. Our living, conscious reality is so concrete and overwhelming, our mental landscape through time is so broad and detailed, that we fail to see the diaphanous boundary of the present which is the entire domain of the universe.

3 A changing universe with no fixed physical laws

A continuously changing boundary universe of the present also reveals that there are no fixed physical laws. While it is almost universally accepted among the academic community that indelible physical laws are embedded in the workings of the universe waiting for us to discover them and triumphantly produce a TOE, the growth of the universe demonstrates otherwise. Even physicists who are convinced of the occurrence of the big bang and inflation acknowledge that the physical laws of our current universe would not yet be present in the embryonic stage of the universe. Despite the fact that it is accepted that our universe had different laws then than now, most assume that the laws are fixed now. This, therefore, is not a rational or proved assumption. Especially when we consider that we have been thus far only able to examine the narrowest sliver of the entire development of the universe. A final TOE is not tenable in an evolving universe.

I suggest that a continuously changing universe which retains all of the information of past events, and perhaps learns from the gargantuan accumulation of events and new possibilities garnered from the world of possibility, this universe will evolve, react and permit new realities to be present. This principle is exquisitely reflected in the changing morphology, adaptability and behavior of life forms that are informed by experience and reacting to the possibilities of their environment and behavior. Ellis and Rothman have pointed out that quantum effects can alter the genetic inheritance of living creatures. This universe has the vast experience of the changing present to inform its incorporation of new realities from

limitless possibility. What does not seem possible in the universe right now may be possible in a future now. In fact, the ultimate destination of the universe might be that virtually anything is possible and nothing is impossible. If anything is possible, then there is no event or state that cannot come to pass, even if it never does. However, the boundary does close real occurrence forever. Lincoln will never stroll home from Fords Theater.

4 The DBU and the world; basic questions

It is critical to understand that the DBU and the non-real world are different domains yet are whole. The pervasive presence of the world throughout the universe is evident in the instantaneous entanglement of entities throughout the universe, as evidenced by EPR, Bell, Aspect and others. This concept of an order enfolded within a deeper order was explored very dramatically by Bohm. There is a larger, more essential, deeper, and inaccessible order that pervades all existence, which is in reciprocal and complimentary relationship, yet we cannot directly detect the deeper order. We do not have scientific apparatus that can examine the non-real future domain of infinite possibility, but we can study the quantum behavior at the interface between the world of possibility and the diaphanous boundary universe which is constantly changing.

If the universe is a diaphanous boundary of continuously changing present, then how wide is this boundary; what is the duration of now? Again we are being betrayed by consciousness time to question at what point does now becomes the past. We can experiment with our actions and events and see that all we can do is keep making a finer and finer slice of now, bringing the past closer and closer to the present. Does diaphanous mean Planck length, or some other miniscule moment? This direction is a mistake as well. Because there is no action of time in the DBU, and the past and the future are non-real, duration is a pure distraction. There can be no duration for the present, just as there is no duration for entangled particle behavior.

In a continuously changing universe with a diaphanous and dimensionless now, are changes of the universe continuous or discrete? I have long believed that at the smallest scales of reality, change must be discrete, and that the apparent continuous flow is analogous to the still frames of a moving film. Many arguments from Xenon to the present have described the discrete requirements of movement. But this introduces the problem of the potential momentary pause between now and next, however small, and the introduction of time. It also introduces the possibility that the universe could stop, and not jump to the next now. However, the discrete universe would provide a discrete location for the present, without the blurring of a continuous now. Lynds [8] and others have suggested that perhaps stillness does not exist, and that entities are only still as perceived relatively on the macro scale. If the universe is continuous, everything is always changing and moving, as per Bohm's thinking that everything is in flux, then the dimensionless now can thrive in continuous motion.

There are deeper questions that are obvious and essential to these proposed ideas. What drives the change of the universe? Is the pace of change variable, the inflationary period being an example, etc.? What are the minimum requirements for a universe to exist and change?

If we accept that the infinite world of possibility is present and eternal, and void of universes changing within it, then what are the requirements for a universe to begin? As evidenced by the apparent existence of our universe, there is a greater than zero possibility that the world would somehow produce entities that would interact and grow. This echoes the theories pertaining to the spontaneous expansion of the universe at a theoretical point in the beginning followed by inflation. Furthermore, it is a common characteristic of living things and chemical reactions that the early stages of growth are astoundingly prolific.

Given how eternal, wasteful and boring that infinite possibility would be without any universe to take advantage of possibilities, it is probable that something would eventually occur in the world. Reality would be driven by an overwhelming preponderance of possibility, and infinite possibility would just be too compelling for a universe not to exist. Is it not possible that when we hope or pray, that we are invoking the eternal possibilities of the world, hoping that the preferred outcomes occur? As conscious beings integral with the whole universe, perhaps we can alter the process in which possibility is converted into real outcomes.

5 Final thoughts

I submit the simplest of physical models in our present experience, which I have drawn from childhood memories, to describe the universe that I have outlined; the carbon snake firework. The cylinder of the carbon firework represents the entire world of possibility. We ignite the cylinder with a match and we have a burning front of intumescent transformation which is our changing, non-flat, DBU in the present, utilizing the fuel of the world of possibility to create reality. The continuous trail of porous carbon represents all information of past events retained in the present universe, and the escaping smoke symbolizes the lost events with occurrences of one, which exits reality (in occurrence only, not in energy or information) from the universe forever.

This essay is an outline for further investigation into the finite and constantly changing diaphanous boundary universe (DBU) of the present, engaging a larger non-real world of infinite potential from which this boundary is fueled. The idea that time only functions in consciousness implies that life and consciousness are primary to the function and/or purpose of the universe. We have a universe that exists in the present but cannot be fully experienced only in the present, so a mechanism in the universe arose which allows the universe to contemplate itself in much broader terms of past, present and future. Do we have a universe that wants to figure itself out, or is the entire universe here merely as an instrument to allow consciousness and intelligence to thrive?

It can be excruciating trying to investigate the nature of an immediate present when it is so natural for our consciousness to continually introduce past, present and future into our minds. This is the world of our thoughts which we cannot banish, except through determined control. Perhaps there are technical methods or experiments that can be devised to explore the nature of the present and create a more fundamental understanding of what the present actually is.

References

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