

Illusion of Space-Time

Perception of Time

The common view of 'time' is that only the present is real and anything that happens does so within a flow of time. Most people intuitively perceive causality---something caused something else to happen. The past can only be inferred by fossils or memories that we perceive in the present and the future can then be inferred by examining fossils of past events and predicting similar outcomes. Newton's more sophisticated concept assumes both Space and Time are absolutes where space is infinite, and time has no beginning or end point. Some scientists believe that time does not have a direction; the laws of physics cannot distinguish between movement toward the past or toward the future. Our Universe is thus a giant eternal space-time block with no past, present or future.

We perceive time only as a change of some 'thing'. Often, we see this as a change in distance or shape (which indicates a change in relationships). It has been claimed that time as an entity (in itself) does not exist. The earliest records we have (500BC) are of Greek philosophers debating the nature of being and non-existence. Xenophanes understood the universe to have existed as immutable. Heraclitus pointed out that 'you cannot step into the same river twice'. Parmenides believed that "only the being has reality--- non-being cannot possibly have reality". What possible compulsion could cause a thing to pop out of no-thing? Today we still debate these same questions, even with our better understanding of natural laws. We now can see that Parmenides 'nothing' should have been 'empty space' which of course is not empty as we now know. Virtual particles

pop out of its quantum fields all the time. But a true absolute nothing from which the 'Big Bang' probability pops out still eludes understanding. For all we know, we may in fact have never popped out--- perhaps we are just one possible characteristic of a non-existent, timeless, Nothing. What a Shaman might call an Eternal Dream state!

Physicists have a deep problem in understanding what 'time' is --- some believe it simply doesn't exist at all, but it is just another figment of our imagination like color perception or depth perception. Our basic problem of course is that 'time' is, in itself, invisible. We assume our sensory input is operating in the present now. Records (fossils of the past) that indicate something of past times, all exist only in the present 'now'. We see a fossil record of a dinosaur and infer that a dinosaur existed in some 'past time'. Only the record of a dinosaur exists 'now', the dinosaur does not. We infer a past history only from records that exist in the present. Most people assume that 'time' exists, and objects exist in a continuous flow of time. But that is only the way it appears---just like the way the Earth appears, flat and stationary, while the Sun appears to revolve around us. I was with a group of friends one night, observing Jupiter with a manually operated telescope. It needed to be adjusted constantly as the image of Jupiter kept creeping out of the field of view. One lady exclaimed in total surprise: "My god! We really are rotating!" It is not that clocks tick in time, but rather it turns out that it is the ticks that cause time.

If it is ticking clocks that produce illusions of time, is it my clock, your clock, or everybody's clocks? Obviously, each tick is a tiny quantum of change somewhere in the Universe. Just to put this in perspective, if one atom changes in one grain of sand, in some sand dune of this world, or of some world in our solar system, or in any star

of the billions in our galaxy, of all the hundreds of billions of galaxies (that only constitute 4% of our universe), ---- well there it is! Each tick represents one static stand-alone instant of 'one now Universe' which is itself embedded inside a dimensionless point of absolutely nothing in the middle of absolutely nowhere, existing in 'notime' and which itself may or may not contain the possibility of infinitely more other universes. You may well ask what is this mind-boggling image? Is it science? ---Certainly not. Is it metaphysics? It is beyond metaphysics. Is it a religion? No. Religions deal with human relations and are usually badly mistaken when trying to explain ontological aspects of reality. Is it Art? Well, at least in Western art we can speculate on the immensity and grandeur with minimal cultural constraints.

So! Time is not something that mediates cause and effect. Instead, time is itself an effect of (?). But we know that Space and Time are an integrated entity (space-time). Thus 'space' is also an effect of something (?). We artists, live within our familiar space-time and compose our 2D paintings, our 3D sculpture masterpieces, and 4D VR movies within the reassuring reality of our sensory environment, so why do we need to care about the metaphysics? Well, perhaps it is the reaching for 'something beyond' that illuminates the best of art. Our physicists are engaged in a form of minimalist art---reducing reality and re-presenting it as mathematical symbols, so it becomes comprehensible to our limited minds. So! We as artists can take it one step further and reach out beyond 'known' physics to enrich our art.

Assume 'time' as an actual entity does not exist and that change in and of itself is responsible for leading us to believe in the appearance of time. Then if time does not exist, we are left with a large number of static slices of being, all present 'nows'. Where does all this infinite

number of 'nows' reside? According to Barbour, they are to be found in an imaginary infinite 'configuration' landscape called Platonia. But if we are to deny the existence of time, we must also deny space, even imaginary 'configuration' space. For example, visualize our space shrinking, smaller and smaller and smaller until the tiny point finally becomes no space --- nothing at all, but *this* absolute nothing is very fertile because it is the mother of absolutely everything. True nothing, (NO Space and no Time), I will refer to as a 'NOST'. Perhaps there is no difference between nothing and the possibility of everything! It is an idea related to a concept from Information Theory, where if you have a minimum of organization, you have a maximum possibility to structure (messages). (You can write more stuff on an empty blackboard than on a cluttered one.) No Structure = All possible structures. If you have an infinity of absolutely nothing, then maybe you also have an infinity of absolutely every possibility. True NOST perhaps is *both* as absolute nothingness and absolute everythingness. For those of us who feel more comfortable with a God at the head end of things, a god-like NOST would be a GNOST. (Gives a whole new meaning to 'agnostic'!) Seriously though, why would it be necessary to CREATE absolutely nothing. It simultaneously just 'is' and simultaneously just 'isn't'. (A truly Quantum idea)

Worlds without Time

This brings us to a version of the 'many worlds' theory. Most modern scientists probably believe in some form of a multiverse or at least some version of a many worlds theory. Barbour's controversial concept is one in which each world is one timeless instant, if you like, a static single 3D frame among untold infinities of other static frames.

This poses interesting questions from an artistic viewpoint. For instance, if music sounds generated in sequence in a series of still timeframes, what does it mean to listen to music? What exactly is a movie if not a series of snapshots in sequence? How is Virtual Reality different from everyday perceptual 'reality'?

We know that a film projector advances still frames at a rate of 24 per second (each frame is displayed twice), and what we see is a continuous film. The same happens when we view television at 25 or 30 frames per second. (Two interlaced fields per frame).

In both instances we exceed the human eye-brain critical fusion frequency (CFF=48cps) and perceive constant motion instead of a series of still frames. In fact, our conscious model of reality is being updated and appears to us as a continuous reality changing smoothly in time. Thus, anything changing at greater than approximately 50 times per second appears as a steady, smooth change. Anything changing faster than our brain can update our present frame of consciousness, (500milliseconds), will appear, falsely, as continuous motion. The best example, and one of the most beautiful works of art that illustrates this is available on the Internet from the National Film Board of Canada. It is MacLaren's short film "Pas de Deux". Take a look. Enjoy! MacLaren was a master of the illusion of movement.

On a wonderful clear night, I was outside with the local Astronomy Club with our array of telescopes. One member took me aside and complained that nothing new was happening up there. "I have seen Jupiter, Saturn, and Mars. I have looked at the Orion nebula and Andromeda many times. It's all the same evening after evening. Time for me to quit!" As an artist I realize that most of the time what we think we see is in fact a 'still-life'. What I paint onto a canvass is a 2D still-life. A sculpture is a 3D still-life. But as a Quantum-age artist I feel obligated to look beyond what are simple appearances, even stuff we

might see through a telescope or microscope. We need to look and look and look until we really 'see'. For example, if we observe an exploding supernova night after night and see same old, same old, what we can do is make a computer model of it and produce a series of frames which we can then play back at 60 fields/sec and voila, we are now have a 4D supernova explosion in motion that everyone can 'see'! Quantum-age art! If the tiniest change of one electron in a Plank distance, anywhere within our Universe, 'quantum jumps' us to the next 'now', uncountable billions of billions of times faster than our CFF, the perception is of smooth, continuous change in a more or less stable world. The image of a Universe consisting of an infinite number of static frames ('nows') is really not that strange after all! Perhaps we are all actors in a Cosmic movie consisting of a string of motionless still frames.

Of course, the above is only an analogy and we can try to do better. Consider that in each frame we have fossils from a string of adjacent frames which we think of as 'the previous'. But zillions of frames exist between some 'previous' frame and the 'present' frame in which 'consciousness' (our physical analog of reality) contains enough fossils to constitute our next perception. Our consciousness appears as a series of frames that are 1/50 second apart but are themselves separated by 'zillions' of other static frames that we are totally unaware of. We can visualize our thoughts as sparsely situated frames sitting along a very long string of adjacent frames. Next to each percept are frames with simplified fossil memories of it. Just because these are very simplified, when we have another thought we sometimes believe that we are observing the same object as before. Actually, there are no identical frames, and *nothing* can ever be the same within any one static frame. The ancient Greeks were right to observe that one cannot put one's toe into the same river twice. Not

only does each change of river belong to a different universe but so also each toe. The concept of this type of universe does not allow 'sameness' thus it also forbids 'equality' and the concept of number! It puts a serious question mark on the validity of 'mathematics' and the 'scientific method'. However, since we assume that the future frames will appear to be similar within a limited locality, we can do approximate predictions and hence our belief that the scientific method actually more or less works. (At least 95%) Furthermore this type of universe does not allow what we normally think of as simultaneity except that since time does not exist, we might simply say that *everything* is simultaneous in any one static frame. In other words, the concept of simultaneity makes no sense if 'everything possible' already exists in NO TIME. Nothing allows Everything and Everything is just an aspect of Nothing. Or if you prefer soundbites: Nothing is Everything and Everything is Nothing! Existing inside a Universe where we know we exist by feeling our own bodies as well as bumping into others, we are now asked to conceptualize the 'existence' of a NOST, an entity that has no Dimensions and no existence in Time. In other words---the 'existence' of nonexistence!

So! What is a poor confused artist to think? Well! Suppose the art of creative mathematics is no more than a way of re-arranging equations of symbols; and suppose science is the art of assigning symbols to things we cannot comprehend so we can think we actually know something; and suppose theology assigns symbols of absolute faith to things humans absolutely cannot ever know. Well then, what is art if not the construction of symbols to try and better enlighten our 'ahaa' feelings of understanding. It's just that we Quantum-age artists do it without the self-imposed constraints of science or theology. We simply do it with more flair, with panache, withchutzpah!

