The Physical Nature Of Time

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Forward

There are two systems that need to be considered when searching for the true nature of time. The first is the structure of the world that we live in and how and why time comes from it. The second is the structure of our minds and how they interpret the information about time that is transferred into them from the external world. Due to the size limitations for this paper it is not practical to cover both areas, so for the most part it will be limited to the structure of the universe and what parts of it contribute to our sense of the meaning of time. In order to get a better understanding of time it is necessary to get some understanding of the basic dimensional structure that generates the spatial environment that all entities in this universe exist in and then to also get a better understanding of the structure of those entities.

The Structure Of The Spatial Dimensions

First let's look at some basic structuring and dimensional structuring concepts. All structures contain information. The information can be a direct part of the structure and, therefore stored as part of the structure itself as properties of the structure. An example of this type of information is the concept of an identifiable point or position. All spatial dimensional structures contain the potential to have one or more points or positions that can be located and identified as separate from any other such point or position. This is because any dimensional system is designed to contain other structures or entities and each entity must be able to be identified in order for it to be able to store and maintain the integrity of its own information. In the case of dimensional systems that allow for motion, identifiable points are also needed to allow for entity interactions that allow transfer, sharing, and joining of information between entities. Information can also be derived from the basic built in structural information. Time is an example of derived information and is a derivation of distance and motion information that is a part of our dimensional system's basic direct information in the case of distance and a part of any entity's basic direct information in the case of motion. You may already be familiar with a basic formula T=D/R (where T=Time, D=Distance, and R=Rate) that gives a great deal of information about time.

The simplest dimensional system is the zero dimensional system. If you were able to live and think in such a system, you would be an infinitely small point. The concept of an identifiable point would be a part of your universe, but that would be about all. Such concepts as distance, motion, and time would make no sense in your world because distance requires at least two identifiable points in order to allow for the concept of the separation or distance between those points to be developed and have meaning. Motion requires a distance to move through and time requires both distance and motion to generate its meaning. Your world would only have one identifiable point and you would be it. You would completely fill your infinitely small point universe and so there could be no possibility of another such point. You would have no other place to go to so distance and motion would have no meaning to you. Your world could have no interactions because there would be nothing else to interact with so time would have no meaning to you either. In reality you would not be able to live and think in such a world because both require motions to store the needed large-scale entity information.

The next step up in universes is the one-dimensional world. This universe contains more built in direct information. It incorporates such items as scale and direction.

Scale is the physical size of the universe, which in this case is the same as the length of the dimension. There are three main classes of scale. The first is the finite class. In this class the dimensional line has a limited size. If you lived as a point or line in this type of world you could travel down the dimensional line until you reached the end of it and you would then have to stop because there would be no place to go beyond that point. The second scale type is the infinite class. If you traveled down the dimensional line in this type of world you could continue in that direction without end and you would never return to any point that you had passed in your journey or to your starting point. The third class of scale is the bounded infinity. It comes in two main types. They are the logical and physical types. In the logical bounded infinity, if you travel down the dimensional line as before, you reach the end just like in the finite universe, but if you continue to travel in that direction you are transferred to the beginning point at the other end of the dimensional line and then you continue to travel in the same direction as before. If you travel far enough you will get back to the point from which you started your journey and then you will go over your journey's path again. This type is called the logical type because there has to be a transfer method to transfer you from one end of the dimensional line to the other end because the ends are not physically joined. This implies a hierarchical structure and would not, therefore occur in any natural way, but would be an indication of an intelligently designed structure because of the necessary logic based transfer subsystem. The physical bounded infinity gives most of the same results as the logical bounded infinity, but in this case, the ends of the dimension are physically joined by curving the dimensional line through another dimension so that the ends can meet. The line is not really going straight in one dimension and curving into another dimension, but curving equally in both dimensions. The resultant enclosed dimensional line path is actually an entity in a larger two-dimensional structure. It would only appear to be one dimensional to an entity that can only perceive the path. A being that lived in that condition could discern his situation if he could see far enough and travel far enough down the path because he would see a horizon effect beyond which he could not see and

as he traveled down the path new things would appear from over the horizon much like is observed by someone on earth in a ship at sea when it gets close enough to land so that the land is no longer over the horizon. Physical bounded infinities always require one more dimension than is observed by those within the system to allow for the curvature that joins the ends of the dimensional lines, planes, etc.

Direction also comes in three levels. The first is zero directions. In this type of world entities could not move or interact with each other because they could not move as they would have no direction to move in. Each entity would effectively be in its own single point universe. The second level is the unidirectional dimension. Here you could move, but only in one direction down the dimensional line. When you left a point on that line you would never be able to return to it unless you lived in a bounded infinity universe and then only after you traveled completely through the universe to get there. The third and best type (and the type we have in our universe) is the bi-directional dimension. In this type you can travel in either direction down the dimensional line from any point if you are not at the end point of a finite dimension.

The bi-directional structure of the dimensions that make up this world is greatly responsible for our sense of past, present, and future times. This is because it allows us to easily leave and return to a given place so we can channel surrounding motions into building things such as a house that we can then travel to, live in and, leave and return to when we desire and continue to change to suit our needs. This organized progression of changes in motions gives us the sense of the change of time from past (from when you began to build the house and have stored information about the various construction steps in your mind) to the present (in which the house is completed and you are living in it and make and store new thoughts that lead you) to the future (when you plan to make further changes to the house.) The bi-directional structure is also greatly responsible for the existence of repetitive motions that allow us to measure time as a quantity of repetitive cycles. All points on the earth (with the possible exception of those at the center of rotation) are actually traveling in a two-dimensional repetitive cycle of back and forth motion to generate the time period measurement of a day. Because of the bi-directional nature of our dimensions, we can look at things coming toward us that haven't interacted with us in other ways yet and plan for the future when they arrive to within the range that we can interact with them in other ways as we desire. We can make and observe our interactions with those things when they are in our present range of interaction and then watch and see how our interactions changed the things as they pass us and move away from us. These kinds of observations also give us the sense of passage of time, but in order to see something come toward us, we need to be able to see light that leaves the moving object and travels in one direction in the dimensional line to get to us and as the thing passes us and continues in its path to go away from us, we need to be able to see light that comes from the moving object and travels in the opposite direction in the dimensional line to reach us. This requires a bi-directional dimensional structure.

With the extra space that is contained in the one dimensional world compared to the zero dimensional world, it becomes possible to have more than one identifiable point and this allows for the development of the concept of the separation or distance between such

points. With distance comes the concept of motion between two points and together distance and motion allow us to derive the concept of time. We live in a world in which all entities are made up of motions in the various dimensions in which they exist (this will be covered more later). Time in its essence is a method to allow us to compare one combination of distance and motion with another one. If motion were a single amplitude function, time would equal distance (T=D) because it would always take the same time to travel the same distance. If you told someone how far you traveled, you would also be telling him how much time it took you and if you gave the amount of time you would also be giving the distance traveled. If all motion's amplitudes were always 1 mile per hour, as an example, you could just have one unit that would represent both the amount of motion and the distance traveled since all motions would have the same amplitude and the only possible difference between one motion and another would be the distance that it traveled through compared to the other motion. If you said I traveled for twenty miles today you would not only be saying what distance you traveled, you would also be telling how long you traveled. Time and distance would be one and the same entity. In reality motion is a multi-amplitude function, however, so it is necessary to include the motion amplitude when comparing two motions through distances. That is why the formula is T=D/R. The R is the rate, which expresses the amplitude of the motion. So time increases as distance increases and decreases as motion amplitude increases. When we talk about a unit of time we are actually talking about a standard set of distances and their associated motion amplitudes that all yield the same result when you divide the distance by the motion amplitude. The earth's rotation on its axis and the time unit of the day are a good example of this. The day is roughly equal to the motion of all points on the earth in one complete rotation around the center of the earth. If you select a point on the earth that is near the equator so that one revolution equals twenty four thousand miles, the distance traveled in one day will be the twenty four thousand miles and the motion amplitude of the point will be one thousand miles per hour. If you pick another point on the earth farther north so that the distance traveled in one day is twelve thousand miles, the motion amplitude will be five hundred miles per hour. These motions and associated distances and any other sets that yield the same result are all members of the standard set called one day. This works fine except in cases where there are great differences in fifth vector velocity. In that case distance also becomes a multi-amplitude function (this will be covered later also when we get into describing the structure of entities).

Multi-dimensional universes (those with two or more dimensions) generally contain all of the information within a one-dimensional world and also usually contain other information that has to do with the method and way that the dimensions are joined (the dimensional interface) and possibly differences between dimensions in the system such as size of the dimensional lines etc.). In our world the first three dimensions all seem to be the same size and all intersect with each other at a ninety-degree angle to each other, as an example. There are two schools of thought concerning multi-dimensional structures in this world at this time. One (the most predominate at present) treats the structure as a single one level unit (black box) and looks only at the outputs that are generated as a result of inputs. In this approach one does not look for the internal structural causes of specific outputs that are generated by a certain input pattern. Using this approach a person might conceive of entities (particles) spontaneously coming into or

going out of existence at random places and times, or that such entities contain properties such as mass that can only occur in multiples of certain quantities, but he would have no idea as to why it works that way or what structures generate the properties. The second school of thought on the subject attempts to understand why the system works the way that it does and what structural mechanisms are responsible for both the nature of the dimensional system and the entities within it. An example of this approach would be to try to understand what structural mechanisms would be necessary to maintain entity identity when two one-dimensional worlds are joined together to form a single two-dimensional world. In a one-dimensional world, an entity can be composed of motion that separates it from the motionless background. Each entity's motion automatically contains information within itself such as its size, position, direction, motion amplitude, etc. When you tie two dimensions together, however, each two-dimensional entity now contains two motions, one motion from dimension one and another from dimension two. The information as to which motion in dimension one is linked to which motion in dimension two to generate the entity's position, direction, and motion amplitude in the two-dimensional structure must be stored somewhere in some form in the system. Multi-dimensional structuring can get very complex and is well beyond the scope of this limited paper and could fill many volumes, but I believe we have covered enough dimensional structuring basics so that we can progress to the subject of the structures of entities in this dimensional system.

<p align="center">Entity Structure</p>

First let's cover some basic entity information. All entities (sub-energy, energy, and matter, etc.) in this system are composed of a combination of various motions in the dimensions in which they participate. All mass/inertia effect is caused by motion. Basically motion equals mass and mass equals motion.

The simplest entity structures, sub-energy particles, (Note: the word particle is used only to designate an individual entity and does not refer to so called wave/particle duality etc.) are composed of motions in one or more of the first three dimensions. The composite motion generated in the three dimensional structure is less than the speed of light in some direction that is based on the relative motion amplitude in each dimension. Sub-energy particles do not exhibit any frequency or wavelength effect due to the lack of a fourth vector (fourth dimensional) velocity. They have a very small mass effect due to their sub-light velocity in the first three dimensions, but it is small enough that man in this world has not yet detected them. They do not generally interact with matter on an individual particle level because their motion quantities are usually below the interaction minimums for matter interactions. They can interact some with energy photons and tend to slow the photon down in some direction in the first three dimensions, but this causes an induction of motion back into the first three dimensions as needed to restore the photon's three dimensional velocity to the speed of light from the photon's fourth vector velocity. The resulting decrease in fourth vector velocity causes a decrease in the photon's peak variable mass effect and frequency and an increase in its wavelength. The net effect is to cause a slight red shift in the photon. This effect is small enough that it is only noticeable in photons that travel over long distances and is proportional to the

distance traveled. It is possible to detect sub-energy on the large scale by its composite gravity effect.

Energy photons are the next level of particle structure in this world. If you take a sub-energy particle and attempt to increase its composite three dimensional velocity to greater than the speed of light, any motion that exceeds the speed of light is induced into the fourth spatial dimension. This fourth vector velocity generates the photon's variable mass, frequency, and wavelength effects. To get a rough mental image of how it works lets look at a less complex structure. Think of a two-dimensional world in which one dimension goes left and right and the other one goes from you and toward you. You are three-dimensional so you can look at this world from up above it in the third dimension (your head is above the two-dimensional plane). The sub-light particle is initially traveling at some composite velocity in some direction in the two-dimensional plane. For ease of visualization let's assume that the particle is circular in shape when looked at from above in the third dimension. Any two-dimensional being living in the two-dimensional plane would see it as a curved line. By moving around it and seeing it from different viewpoints the being could determine that it had a circular shape in the same way that we can determine that the moon is basically a sphere shape even though we do not see the whole sphere when we look at it from just one point. When its velocity is increased it gains motion in the third dimension. This causes it to begin to travel up out of its two-dimensional plane. The third dimensional motion causes it to now be in the shape of a sphere to you, but to the being trapped in the plane it still looks like a circle. The main change to him is that as the particle leaves the plane it gets smaller and smaller until it completely disappears when it is completely out of the plane. Now let's assume that the third dimensional line is very small. As a matter of fact it is just equal to twice the size of the particle. We'll also assume that the plane is in the exact center of the third dimension. This means that just as the particle leaves the plain completely, it hits the end of the dimensional line and bounces back in the other direction. It now begins to enter into the plane again going down from above. As it enters the plane, the being in the plane first sees a small dot that grows into a circle that increases to a maximum size when the particle is centered in the plane and then begins to decrease in size as it begins to leave the plane in the down direction. It again just completely leaves the plane in the down direction when it hits the bottom end of the third dimension and bounces back off of it in the up direction again. This cycle continues as long as the particle has a third vector velocity. If you increase the third vector velocity, it travels faster in the third dimension so that the particle travels a shorter distance in its two-dimensional composite motion during each pass through the plane in the third dimension. This causes an apparent decrease in the wavelength of the particle in the plane. The increased third dimensional velocity also causes the particle to travel faster in its up and down motion in the third dimension so it travels through the plane more often thus increasing the frequency effect. The right angle angular motion component introduced by the particles third dimensional motion as it travels through the plane introduces a mass/inertia effect that varies from zero at zero overlap of the particle with the plane to a maximum level when the overlap is at maximum when the particle is centered on the plane. This angular variable mass/inertia effect is at an angle of ninety degrees to the other two dimensions and changes direction for each half cycle as the particle travels through the plane in the

opposite direction. The greater the third vector velocity, the greater the variable mass/inertia effect. You can experience a similar large-scale effect by mounting a bicycle wheel at the center of a two-foot shaft. If you then grab a hold of the shaft on one side of the wheel with one hand and grab onto it on the other side of the wheel with your other hand and try to move one hand up while you move the other hand down, you will notice that it is relatively easy to do so, but if you have someone spin the wheel and then try to do the same thing again, you will now find it much more difficult to do so. The faster the wheel is spinning the more resistance you will encounter. Now all you have to do to get an idea as to how it works is to change the third dimension to the fourth dimension and add another third dimension that is the same as the first two dimensions and you have a mental image of how energy photons work. I am not saying that they really work exactly that way. Fourth vector structuring concepts can be very complex at more advanced levels such as looking at how interactions with other photons and matter particles work or developing structural phasing concepts etc.

Matter particles are the next higher level of entity structuring. If you increase the fourth vector velocity to a high enough level and the proper angular components are present, some of the fourth vector velocity can be transferred to the fifth dimension. The structure of the interface between the fifth dimension and the first three dimensions is such that the fifth vector velocity causes the photon's path to become curved in the first three dimensions in such a way that it curves back upon itself and creates an enclosed path. This enclosed path is what is seen as the matter particle. This path can be either moving or stationary in respect to other entities. The angular motion components introduced by the fifth vector velocity are responsible for most of a matter particle's rest mass/inertia effect. Even though it is called rest mass because the path (particle) is at rest, it is really the result of motion. Matter particles also still have a fourth vector velocity so they also exhibit frequency and wavelength effects. The greater the fifth vector velocity, the greater the curvature of the path and the greater the mass/inertia effect. The stability of matter particles is greatly dependent on the proper structural phasing between the variable fourth vector velocity generated mass/inertia effect and the fifth vector velocity generated enclosed path structure. Unlike the dimensional interface between the fourth vector and the first three vectors that causes any composite velocity greater than the speed of light to be induced into the fourth dimension, the transfer of velocity from the fourth vector to the fifth vector requires the presence of certain angular components. This means that it is possible to have one photon of energy with about .511 MEV with all of its excess velocity stored in its fourth vector velocity and at the same time have another photon with about .511 MEV in which some of the fourth vector velocity is transferred to the fifth vector so that the photon is turned into an electron that is about at rest. Both have the same total amount of motion, but in the case of the photon the motion is seen in the first three dimensions as traveling in a straight line at the speed of light while in the case of the electron the motion is traveling in a small enclosed path so it seems to be standing still. Total motion is completely conserved, however. This is the law of conservation of motion.

When you increase the composite three-dimensional velocity of a matter particle toward the speed of light some of this added velocity is transferred to the fifth vector velocity.

This has the effect of increasing the curvature of the particle's path and thus decreasing its size. The net effect is that, for the particle, distances change. This is why distance becomes a multi-amplitude function with matter particles near the speed of light. The percent of velocity transferred to the fifth vector increases as the particle's velocity increases toward the speed of light. At the speed of light all added velocity is transferred to the fifth vector.

Summary

To sum it all up, we live in a world that is for the most part made of motions and time is a way for us to compare those motions with each other so we can learn more about how they interact with each other and with us so we can coordinate our motions with others to accomplish the end results that we desire. There is of course the fact that the way we perceive time is greatly affected by the way our minds store records of past motion event conditions, how we observe present motion conditions, and how our minds use these past motion records and present observed motion conditions to extrapolate concepts of how we expect future motion events will be. Note that only the present represents actual motion events that are occurring now in the world. The past is in our mind in the form of stored records of motion conditions that have now changed to something else and the future is also in our minds in the form of what we expect present motion conditions to change to as a result of our past experiences and the current state of motions and their interactions etc. To look at it from the global perspective, the past is the continuum of all the motion conditions from the beginning of motion in the universe until now. The present is the current state of motion conditions and the future is the continuum of motion conditions that will occur from the present until the last motion that occurs in this universe. Only the present motion conditions are in existence so there is no past to go back to since all those conditions were destroyed by the chain of interactions that have generated the present motion conditions and the future conditions of motions are not yet in existence either so it is not possible to go to them either.

Note:
In this paper I have included some approximations, simplifications, and examples that give the overall concepts, but are not necessarily complete, accurate, and true in all respects and details. This was necessary in order to present the information at a level that would allow some very difficult concepts to be presented in a way that they could be more easily understood and to stay within the allowed five thousand-word limit for this paper.