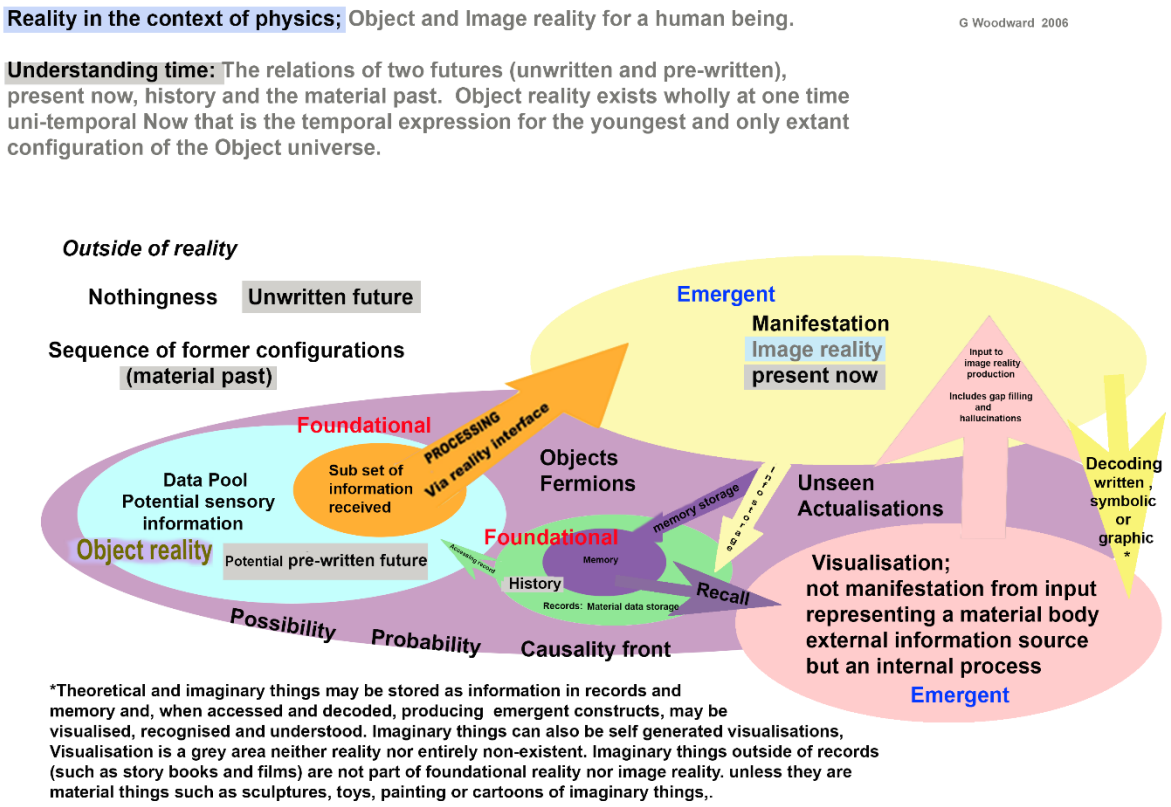
Uni-temporalism, the relation of human beings to time and the 'future' of time in physics: G Woodward 2016



To write about Uni-temporalism it is necessary to say a little about the universe to which it applies.

Having a differentiation between Object and Image reality, as shown above, it is possible to say that the 'O*bservable* universe' is referring to Image realities obtained from observation and potential image realities (that might be obtained because of accessibility of the information). The term 'Visible universe' seems to have been superseded by 'Observable universe, perhaps because what is observable via technology extends beyond the visible spectrum. These are not the Object universe but products of received information and its processing; made into seeable and intelligible images by use of technology, patience and artistry.

The Object universe contains material objects, fermion particles and photon particles within an environmental context. It exists independently of observation. It is not directly knowable, as investigation and experience rely upon receipt and processing of sensory information. It has a uni-temporal (same time everywhere) configuration in which objects and particles wholly exist, there being no other extant foundational time in which they could also exist or be spread across.

Within each configuration properties and relations such as scales, masses, separations, relative orientations and gradients that accommodate the forces that will act; to allow, constrain or prevent change to give the next arrangement, in a continual sequence. Each material configuration (and new set of associated relations) output, is the next input upon which the laws of physics, and biology act. Forces act and motion occurs across the *sequence* of configurations.

Everything is in motion, (considered over all scales), so the Object universe is continually changing, some relations between objects will persist within Uni-temporal Now and others will be extinguished. Relations within the configuration at Uni-temporal Now are extant, true relations. The forces that act within each new configuration lead to another new universal configuration and cannot lead back to the former universal configuration. The whole Object universe cannot be put into reverse. Applying Newton's first law (the Law of inertia), and the conservation of energy; An Object universe in motion continues in motion unless acted upon by a universe stopping force.

Classical mechanics alone appears time reversible. Positions in time and space used to represent starting and ending points of the action of an object are considered stationary. However, although they may seem to be stationary relative to each other they are not stationary when considered over all scales.

As previously mentioned, the motion of the entire Object universe cannot be reversed because of Newton's first law. A singular action reversed would not take an object back to the same position because the motion of the rest of the constituents of the Object universe has occurred in the duration of the original motion and then the reversal. Such

a reversal cannot therefore be considered time reversal. Consider an object moving on the Earth surface. The point the object returns to will not be in the same place in the Object universe as the Earth has moved. Starting at A on the surface, at X relative to the sun, travelling to B and then back to A at Y relative to the sun. The change in relative positions of the astronomic bodies (and so the material-spatial position of A) is relatable to ideas of passage of time. Returning to an *absolute* position in time and space, irrespective of the contents of space, requires the endurance of that space and time previously occupied. If foundational time is the configuration of the Object universe, and its continual change is foundational passage of time, there can be no returning to a former extinct configuration of the Object universe. There can only be the imagined return to a historical position within the imagined sequence of former iterations of the Object universe. Classical mechanics time reversibility is due to the eternal persistence of absolute Newtonian time. If replaced with uni-temporal, -Now time, the unambiguous sequential occurrence of events is retained but time reversibility is not, overcoming the incumbent paradoxes.

Although ageing is associated with passage of time, it is due to changes in material configurations, that may affect function. Reversal of deleterious changes providing rejuvenation or restoration is not time reversal but continuing change in the sequence of uni-temporal -Nows taking a material configuration back to a configuration resembling a former configuration, or state of functioning, but *not* a former time. Rejuvenation might be compared to building restoration. A restored building is not taken back to the past but remains as a material configuration at uni-temporal Now, resembling its former appearance, within a different configuration of the Object universe.

Some views on time for comparison:

Eternalism:

The view that all points in time are equally real. A view held by Paramenides. “whatever is must be ungenerated and imperishable; one, continuous and indivisible; and motionless and altogether unchanging, such that past and future are meaningless for it.

This is “all that can be said about what truly exists,” and reality is thus revealed as “something utterly different from the world in which each one of us supposes himself to live,” a world which is nothing but a “deceitful show” (Guthrie 1965, 51). **1**. “Parmenides also is supposed to have criticized the Milesian union of the material and moving cause in their principles by arguing that motion and change are impossible and inadmissible conceptions (Guthrie 1965, 5–6, 52). **1**.

As we have seen, Parmenides’ insistence on the point that whatever is, is, and cannot ever not be leads him to be harshly critical of the ordinary run of mortals who rely on their senses in supposing that things are generated and undergo all manner of changes. Parmenides directs us to judge reality by reason and not to trust the senses.” Palmer, J., (2016). **2.**

Einstein’s Space-time continuum and Block time representations also belong with the Externalist viewpoint. Though there are also ‘growing block’ or ‘becoming’ models that accept past and present as equally real but the future as non-existent.

Minkowski Space-time

In 1906, shortly after Albert Einstein’s announcement of his special theory of relativity Hermann Minkowski, developed a new mathematical representation for conceptualizing space and time emphasizing geometry

Quote “The views of space and time which I wish to lay before you have sprung from the soil of experimental physics, and therein lies their strength. They are radical. Henceforth, space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two will preserve an independent reality.” Address to the 80th Assembly of German Natural Scientists and Physicians, (Sep 21, 1908), Markosian, N. (2016). **3.**

As explained by Dr. Sten Odenwald (2016), for the NASA Astronomy Cafe, part of the NASA Education and Public Outreach program. **4**. “This new reality was that space and time, as physical constructs, have to be combined into a new mathematical/physical entity called 'space-time', because the equations of relativity show that both the space and time coordinates of any event must get mixed together by the mathematics, in order to accurately describe what we see.”

Dr. Odenwald goes on to explain the argument that: “Because space consists of 3 dimensions, and time is 1-dimensional, space-time must, therefore, be a 4-dimensional object. It is believed to be a 'continuum' because so far as we know, there are no missing points in space or instants in time, and both can be subdivided without any apparent limit in size or duration. So, physicists now routinely consider our world to be embedded in this 4-dimensional Space-Time continuum, and all events, places, moments in history, actions and so on are described in terms of their location in Space-Time.”

“In this conception, there is not one metric for time and another for space; rather, there is one spacetime metric supplying spatiotemporal distances between four-dimensional events. These spacetime distances are invariant properties of the spacetime. Time can be decoupled from space only in an observer-dependent way; each distinct possible inertial observer (one who feels no forces) carves up spacetime into space and time in a different way. In a sense, there is no such thing as time in Minkowski spacetime, if by "time" one conceives of something fundamental.”

“As one can decompose a vector in Euclidean space along indefinitely many different bases, so too can one decompose a four-dimensional spacetime vector along many different bases in Minkowski spacetime. Mathematically, coordinate time in special relativity is just one component of an invariant spacetime four-vector, just as y' is one component of a Euclidean spatial vector. In the Euclidean case, the value of the arrow along the first component of the decomposition varies with basis; so too in spacetime, the value of the first component—here, coordinate time—varies with frame of reference.” Thomson, G. (2006). **5**.

Presentism:

The view that only the present exists. That there is no future or past within that philosophy of time but only change of the present.

> "For yesterday is but a dream, and tomorrow is only a vision;
> But today well lived makes every yesterday a dream of happiness,
> and every tomorrow a vision of hope.
> Look well, therefore, to this day." Kalidasa (5th century). **6.**

While fitting with everyday experience Presentism does not fit well with Einstein's relativity which has become accepted mainstream theory. That has been good reason for opposition to Presentism as a model of time in physics.

Uni-temporalism:

The view that there is only one foundational time, and passage of time, everywhere in the Object universe and there is also emergence of an image reality with a temporal dimension, from information processing.

Foundational uni-temporal Now time (-Now time) is synonymous with the *continually changing configuration* of the Object universe. The youngest and only existing configuration is uni-temporal Now, the temporal expression for the material-spatial configuration.

Astronomic motions and atomic motions imply that it is reasonable to assert that no part of the Object universe is entirely static considered over all scales. Even at absolute zero in a laboratory the frigid substance will still partake in the motion of the planet; ground movement, rotation and orbit of the Sun. The energy remaining will be the sum of all motion when thermal vibration has been minimized. So, change is continual and can be *represented* as a sequence of iterations of the Object universe along a fictional historical time line. As the former iterations do not exist, it is not a geometric dimension of the Object universe. The Object universe has a uni-temporal (same time everywhere) configuration in which objects and particles wholly exist, there being no other extant foundational time in which they could also exist.

Reality pertaining to the Object universe can be represented by a set structure. Object reality is represented by the largest set, containing a *sub set* of all potential sensory data within it, called the Data pool. Outside of the sub set are the other components of Object reality, including all material objects, atoms, ions and fermion particles. In Object reality, the Objects and particles also have relations between them.

Motion and forces do not fit into the set representation. They are not members of the categories represented in the afore mentioned sets, but need to be considered over the historical time line of the sequence of configurations, as the action of forces and motion occurs across the sequence of configurations. Though the material components and photons can be represented separately from their motion, the energy (change or potential for change) component is not 'distillable' in nature.

This diagram makes clearer the way in which we encounter time. The material events occurring across the sequence of uni-temporal Nows are encoded in emitted/reflected EM potential sensory data (the potential pre-written future). The information, when received and processed becomes the present-now and is then stored as records and or memories called history. The material future (unwritten future) does not exist and nor does the material past. A nonexistent i.e. Open material future allows the possibility of true randomness and free will.

Persisting configurations of matter are subsumed by the youngest Object universal configuration so are part of uni-temporal Now and not the past. Nonexistent material past and future prevent time travel. This organization dispels the paradoxes of relativity. I have written potential pre-written future as it is only after receipt of the information that it can be said it *was* a pre-written future. Not all potential sensory data will be received and so pre-written future is a subset of the data pool. But which data belongs to the set cannot be known with certainty, although there will different probabilities of receipt that depend upon the location and motion of potential observers relative to the information.

There is no geometric time *dimension* of the Object universe. Unlike the space time continuum, it is not a 4-dimensional object. However, an imaginary time line along which iterations of the Object universe are spread can be imagined. The data produced

by different object configurations within it, exists within the one uni-temporal Now configuration spread out in space from the material, actualised object, sources. Each photon (or other type of potential sensory data) could be imagined labelled with an info temporal number or colour identifying its Object universe configuration of origin.

For comparison: Dr. Sten Odenwald *(2016),* wrote: "*When we examine a particular object from the stand point of its space-time representation, every particle is located along its world-line. This is a spaghetti-like line that stretches from the past to the future showing the spatial location of the particle at every instant in time. This world-line exists as a complete object which may be sliced here and there so that you can see where the particle is located in space at a particular instant. Once you determine the complete world line of a particle from the forces acting upon it, you have 'solved' for its complete history. This world-line does not change with time, but simply exists as a timeless object."*

With the arrangement shown in the diagram, the source of the present now is not a material future. The world is not revealed by moving along a world line through space-time, into new pre-existent spatial configurations. Without a geometric time dimension, observers do not have world lines through space-time and are not 4 dimensional objects. A historical representation can be made that could show the path through the sequence of former configurations. However, it is only a representation not a physical object, as only the youngest configuration exists.

Comparison of Newtonian absolute time, Einstein's proper time and Uni-temporal/Configuration "time".

Newton's absolute time:

Newton's view of time reflects his views on God. Regarding God as eternal and omnipresent necessitates, for Newton, real time with those same characteristics. Quote "Isaac Newton founded classical mechanics on the view that *space* is distinct from body and that *time* passes uniformly without regard to whether anything happens in the

world. For this reason, he spoke of *absolute space* and *absolute time*, so as to distinguish these entities from the various ways by which we measure them (which he called *relative spaces* and *relative times*).” Rynasiewicz, R., (2014). **7.**

Newton’s time is an eternal thing separate from the matter of the universe. In contrast to Uni-temporal/ Configuration time that is transient and synonymous with the transient configuration of the material Object universe.

A return to Newtonian time is not a solution to the problems of physics. Newtonian time comes with the philosophical reasoning of what it is, and that is incompatible with modern secular physics. There is no scientific evidence to substantiate its independent existence or reason for being and it has the potential to allow paradoxes of time travel. Merely by the postulate of there being un-experienced time outside of Now.

That "Absolute, true and mathematical time, of itself, and from its own nature flows equably without regard to anything external", is itself a problem. Newton had no problem with Eternalism, as it comes naturally from his faith in eternal God.

"It is allowed by all that the Supreme God exists necessarily", "All that diversity of natural things which we find suited to different times and places could arise from nothing but the ideas and will of a Being necessarily existing", "and by the same necessity he exists always and everywhere." Newton, I. (1687). Cited in Motte, A., (1966). **8.**

“He is eternal and infinite . . .; that is, his duration reaches from eternity to eternity; his presence from infinity to infinity . . .. He is not eternity and infinity, but eternal and infinite; he is not duration or space, but he endures and is present. He endures forever, and is everywhere present; and, by existing always and everywhere, he constitutes duration and space. Since every particle of space is always, and every indivisible moment of duration is everywhere, certainly the Maker and Lord of all things cannot be never and nowhere." Newton, I. (1687). cited in Motte, A., (1966). **8.**

Einstein's proper time:

The time shown on an observer's own clock at rest at the observer's spatial location.

Proper time is also called *clock time*, or *process time,* and it is a measure of the amount of physical process that a system undergoes…These give absolute physical quantities and do not depend upon assigning any coordinate system, as does a numerical representation of space or real time. Andrew Holster, A. (2016). **9**.

Differences to uni-temporal time

1. Proper time applies to the observer's clock on his world line and not to the whole material universe.

2. As it refers to a clock, it is a seen measurement. Uni-temporal-time refers to the un-see-able extant configuration of the entire Object universe.

3. Such a Proper time measurement is a part of the space-time continuum so has persistence unlike Uni-temporal time that is transient and synonymous with a transient configuration of the Object universe.

Conclusion

Both Newton's absolute time and Einstein's Proper time have the characteristic of continual, uniform, unidirectional passage. They have those three characteristics in common with Uni-temporal Now (-Now) time, but are philosophically distinct concepts and so cannot be taken to be identical, refuting the requirement for proposition of Uni-temporal Now (-Now) time.

Regarding the persistence of objects

There are two different ideas about this matter;

Endurantism: an object has all its parts are co-existing simultaneously, not extended over time.

Perdurantism: objects are extended in space and time (or within amalgamated space-time) and therefore have a temporal dimension.

Definitions

Actualisation

1.That which has become actual or real independently of observation. That which has existence unobserved and unobservable, independent of all observer's perspectives and potential observer perspectives. 2.The material / substance / objects / media (ontic things of corporeal or material nature) within foundational space. I.e. That is within / makes up the source (Object) reality

Manifestation

An Observed manifestation is the Image reality product from the potential sensory data interception and processing. (Though visualizations can also be produced internally that augment the image reality (compensating for lack of information and gap filling) or appear superimposed upon it (hallucination).) A manifestation can be the conscious experience of a higher organism. Or film image produced by a camera or other type of representation produced by an instrument that receives data and generates a product using the input.

Material objects, *actualisations*, fulfil the criterion for endurantism. Image reality *manifestations of objects* fulfil the criterion for Perdurantism. As they are generated from EM information that has taken different amounts of time to arrive together, giving a temporal dimension to the product. (That looks like an object, though it is significantly different from an actualised material object.) Some differences are listed below.

1. The source of an image, a substantial object having corporeal or material nature, exists whether the image is produced or not.

2. Images are emergent reality formed from the receipt and processing of EM potential sensory data". Emergent, in this context, means coming into existence *as the result of a*

physical process or interaction, involving electromagnetic radiation, that enables image production.

3. Though they may represent living things, images never have the characteristics necessary to be classified as living things themselves, unlike some source objects.

4. The image, seen at a time, by a singular observer, is a limited fixed state emergent reality. An image of one surface aspect of the source object's topology; pertaining to its configuration and properties *when emission of the EM information from its surface occurred*. The speed of light is so fast, at every day speeds and distances the image seen closely resembles an aspect of the current topology of the absolute, actualised object. Whereas the object is an absolute actualised foundational reality. Absolute because it is simultaneously the source of all possible images of it. I.e. with no reference frame applied, all prospective viewpoints of it that might be imposed are equally valid. Actualised meaning a substantial element of Object reality (i.e. having corporeal or material nature), existing independently of observation. While the source object has internal structure the seen image does not unless the source object is transparent. No information pertaining to the internal structure is received and so it forms no part of the product. (There are some exceptions such as the products of; sonar, x ray, CT scanning)

5. Scale differences: Consider that a 6m tall building can appear to become a 1cm tall building by walking away from it and then looking back at it. Without any change in dimension of the building object itself occurring. That relativity of perception for observers at different distances from the object is taken as normal and is part of everyday life. That ubiquitous phenomenon alone is sufficient evidence that it is always images of objects that are seen, and not directly substantial (corporeal / material) objects themselves.

7. Factors affecting information distribution in the environment can affect the image product, such as thermal fluctuations in the air causing a shimmering image. Not applicable to the source object.

Heraclitus (500 BCE)

Heraclictus was a Greek philosopher of Ephesus. “From an early time Heraclitus was seen as the representative of universal flux in contrast to Parmenides, the representative of universal stasis…., both Plato and Aristotle viewed Heraclitus as violating the law of non-contradiction, and propounding an incoherent theory of knowledge based on a radical flux.” Graham, D. W. (2015). **10**.

Quote “*potamoisi toisin autoisin embainousin hetera kai hetera hudata epirrei.* On those stepping into rivers staying the same other and other waters flow. (Cleanthes from Arius Didymus from Eusebius, 1st Century BC) **11**.

It is a statement of opposites of which Heractitus seems to have been fond. Pointing out that what we call a river is a river because of the constant flow of the water in it. It is constant in what it is because of the change.

“the message of the one river fragment, …, is not that all things are changing so that we cannot encounter them twice, but something much more subtle and profound. It is that some things stay the same only by changing. One kind of long-lasting material reality exists by virtue of constant turnover in its constituent matter. Here constancy and change are not opposed but inextricably connected.” Graham, D. W. (2015). **10**.

This view of flux can now be compared to the idea of an Object universe undergoing continual change. The Object universe is the Object universe because of the continual alteration. Nothing within it maintains both an entirely unchanging individual configuration *and* unchanging position in the Object universe, in Object reality.

Mc Taggart Unreality of time

John McTaggart Ellis McTaggart (Mc Taggart*)* wrote about ‘the unreality of time’, in a work of that name published in 1908, in the journal ‘Mind’. Having differentiated two different types of time that he called B series and A series he argued that as there was no A series time must be unreal. Quote “McTaggart distinguished two ways of ordering

events or positions in time. First, they might be ordered by the relation of *earlier than*. This ordering gives us the series, which McTaggart calls *the B-series*. A second ordering is imposed by designating some moment within the B-series as *the present moment*. This second ordering gives us the series that McTaggart calls *the A series*. According to McTaggart, in order for time to be real both series must exist, although McTaggart holds that, in some sense, the A-series is more fundamental than the B-series." (McDaniel, K. (2016). **12**.

Mc Taggart's A and B series of time are ideas set out in The Unreality of Time 1908 Quote "McTaggart also argues that the A series is inherently contradictory. For (he says) the different A properties are incompatible with one another. (No time can be both future and past, for example.) Nevertheless, he insists, each time in the A series must possess all of the different A properties. (Since a time that is future will be present and past, and so on.)" (Markosian, N., 2016). **13**.

Mc Taggart does not support the idea that real change happens, which is necessary for the A series time. Therefore, he concludes that the A series does not exist and so time is unreal.

Space-time is a construct giving a mathematical representation that fits well with observation but is not a complete model of reality. Change also doesn't happen within that model. However, it can be argued that it does contains *Mc Taggart's 'A series of time', past, present and future*, but *only in relation to an observer's position along a world line.* Refuting Mc Taggart's argument that; no time can be both future and past, non-simultaneity of events permits an event to be past for one observer but present or still in the future for another.

The B series of earlier and later seems also to vary per individual observer perceptions so there is no one universally correct sequence. Non-simultaneity of events could allow observers separated by great distances to experience differently ordered events. Each seeing near events before distant events. Also with persistence of material reality spread over time, backwards motion in time is not prohibited which would affect B series ordering. Whatever way the events are perceived, in an *Eternalist model* such as the

space-time continuum or block time *there is persistence of events so both earlier and later are contained*. However, it is debatable whether A and B series of time as envisioned by Mc Taggart are represented in space-time.

Uni-temporal sequential change (in configuration of the substantial elements of the foundational source, (Object) reality) provides the missing *unambiguous,* non-relative, unidirectional B series, that lies not along a time dimension but a fictional dimension, an imagined historical time line.

The A series time can be understood as emergent, related to sensory information, receipt and processing. However, it does not fit Mc Taggart's idea for each member of the series *having the properties* of past, present and future, as they are distinct stages in information processing. Those stages are; pre-receipt/processing (the pre-written future), processing (the experienced present) and post processing (records including memories). Each stage does not have the properties of the other stages. To regard the members of the A series as separate from their physical causes is an abstraction that detracts from the physics rather than adding explanatory power. It also does not strictly give designation of some "moment" *within the B-series* (fitting Mc Taggart's description), as the present moment that is experienced *is not info-temporally homogenous*. (The information processed together into the present can have had different amounts of travel time from the objects that emitted it.)

Two kinds of time

There are two different kinds of time that are of prime importance; the passage of time independent of observation, 1. Uni-temporal (-Now) time: Uni-temporal Now is a temporal expression that is analogous to the changing configuration of the entire material (Object) universe), and 2. Emergent time: the time that is measured or experienced by an observer. Important as main components of a framework that resolves many problems in physics. *Uni-temporal signifies that there is only one such time for the entire Object universe.*

Uni-temporal Now time is a unique pattern of the entire Object universe, each time corresponds to a different unique pattern or configuration. This description of passage of time agrees with (J.C.N. Smith 2012). **14**.

It might be said in this regard there is no *foundational* time that is separate from the substantial configuration; and the passage of time is only temporal expression of the sequence of wholly spatial configurations. Uni-temporal Now is **not** between *observed* past and a material, yet to be observed, future. It is the material 'moment' between what has substantially existed and what does not yet exist. It is foundational, sequential, belonging to the philosophy of Endurantism.

Emergent time: The observers present is formed from the sensory data received and processed. That seen product, the sequence of presents, is a kind of passage of time, an emergent manifestation of passage of time. It is not synchronized with the external reality, so also not synchronized with uni-temporal passage of time. There is delay that increases with distance from the site of EM emission from the source object. The motion of an observer also affects what sensory data is received when and thus also the sequence of presents produced. So, it is informational and *relative* passage of time. The content of the present depends upon the sensory data received and processed (varying for each observer) rather than what exists at Uni-temporal Now, external to the subjective experience. The observed present, product, can contain images of objects in forms and relations that *did not co-exist in material reality*, because information that has taken different amounts of time to arrive can be amalgamated into the product.

For an inorganic reality interface device, it is objectively related to the information input but for an organic observer there is additional processing making the product subjective; pertaining to the individual system and its function (as there is biological variation, see David Eagleman's work (2011). **15**. on observer calibration of delays for example).

Both kinds of time can be described as sequences of configurations. Uni-temporal passage of time is the sequence of configurations of the Object universe. Emergent passage of time is the sequence of products of an organic observer's sensory data processing. Giving a changing present of image configurations experienced as real. Or it

is the sequence of products of the inorganic reality interface; that has received information input, generating a product from it. Importantly for physics; time emergent from the processing of sensory data allows non-simultaneity of events, and uni-temporal passage of time gives a singular unambiguous sequential temporal background for atomic and subatomic events.

It is when the experienced product of sensory data receipt and processing, including distal measurement of time [distal measurement- The viewing of an image of a measurement upon an image of a measuring device, the source of which is distant from the observer], is introduced that non-simultaneity becomes apparent. Due to the very fast speed of light the difference is very small for small distances but increases as distances increase. To form an image of the distant object the sensory information has to be received. The distal measurement relies upon sensory data transmission, receipt and processing; which prevents the product observed from being *identical* to the measurement now (present) on the substantial object clock, seen by proximal measurement [The viewing of a measurement indicated by a measuring device, measuring at the observer location (or very close proximity], ignoring minute transmission time from near clock data emission to observer Image reality product). The relative motion of the observer or observed also affects the way in which the sensory data is received and so the appearance of the product.

It is the sensory data received and product of sensory data processing that gives the apparent time, an Image reality. Image reality and Object reality are not equivalent and are not synchronized. It is important to realize that the measurement is a product of sensory data processing. It is a difference in the appearance of the passage of time and not a difference of "time itself".

*Time **itself** is a superfluous concept*. Time is either bound to the configuration of the Object universe, a uni-temporal Now, **or** the product of information processing that possesses a time dimension related to the material/ temporal origin of the information from which it is generated.

The arrows of time

The first Premise: There is one ever changing configuration of the (Object) universe that is uni-temporal, that is, the same time everywhere. The temporal expression corresponding to the existing configuration is Uni-temporal Now. Only the youngest configuration has substantial existence. The first premise together with Newton's first law explains the "arrow of time". Each configuration of the Object universe contains the relations between substantial bodies and the 'incumbent forces that act to produce the resultant configuration (with the new incumbent forces, and so on). The direction of imagined vectors representing the motion are irreversible because of Newton's first law.

The second premise: The speed of light is not infinite but finite, measured as 299 792458 m/s in a vacuum. Relating that premise to the given example. Traveling at the speed of light it takes time for light emitted from source substantial object A to get to B.

EM information is produced by the interaction of light with substantial matter. The EM radiation is absorbed and re-emitted by the atoms of the source object, as photons with a frequency characteristic of the specific emitting atoms of the material of the source. That frequency information, ‘about the source’ is carried by the photons of electromagnetic radiation.

The second premise (the extremely high but not infinite speed of light) explains why the image realities formed from received light cannot show time reversal. As that would require travel of the observer to exceed the speed of light, to receive the EM information in the order younger (more recently produced) to older (less recently produced); rather than the normal -older to younger- order of receipt.

Apparent events fabricated from received light are distinct from the configurations of and interactions of substantial bodies; the sources of EM information. Motion of an observer alters the pathway through the light (within the environment), giving image realities corresponding to the EM information received. Different relative motions can produce different apparent simultaneities, due to differences in when and where the EM information is received. When an apparent event is seen to occur is variable. When a

material body interaction or relation occurs is invariant as it belongs to a configuration, or sequence of configurations, of the Object universe.

Foundational arrow of time

The one that is the sequence of change of the Object universe from oldest to youngest configuration. Only the youngest exists. The youngest in the sequence of configurations being where change happens, the "Causality front".

The Object universe, unobserved, has a configuration and within that properties and relations such as scales, masses, separations, relative orientations and gradients that accommodate the forces that will act to allow, constrain or prevent change to give the next arrangement, in a continual sequence. Each material configuration (and new set of associated relations) produced, is the next input upon which the laws of physics, and biology act.

It is an irreversible arrow of time. This is the traditional direction of the arrow of time; What was to what is. That has traditionally been called 'past to present'. This can now be better understood as Uni-temporal Now becoming the next Uni-temporal Now and so on. This applies to what is happening unobserved and so is non-relativistic. It gives the '*preferred foliation*' necessary for QM models.

Everything is in motion, when considered over all scales, so the Object universe is continually changing, some relations between objects will persist within Uni-temporal Now and others be extinguished. Relations within the configuration at Uni-temporal Now are extant, true relations. The forces that act within each new configuration lead to another new configuration and cannot lead back to the former configuration. That reversal would require stopping of all action throughout the Object universe to reverse it. That requiring a universe stopping, simultaneously and universally applied force. Then for all the forces throughout the entire Object universe that caused the last iterated configuration to act in reverse, in rebellion against the laws of physics and probability.

Informational arrow of time

At its most basic the *order of receipt of sensory data* from which experience is fabricated, though the brain does adjust the timing of the products from the accumulated data to give consistent causality stories. (As described by David Eagleman.11.) If *how* the perceived direction of time is formed is considered, it is the **pre-written future** (potential sensory data from events that have already happened in Object reality) that is **becoming the present** and then becoming evidence of former being in **records and memory**: Information in the environment -> Present experience -> Records/memories.

This arrow is *theoretically* reversible, if the speed of the observer exceeds the speed of production of the potential sensory data. An experiment using sound and microphone bullets as proof of principle can be considered. With data receipt in reverse the product experienced would be reversed. Of course, this is not traveling back in time as the reversal experience happens within the uni-temporal Object universe with unchanging passage of time.

Emergent (experienced) arrow of time

The third imaginary arrow is the arrow of time that is the experience is of each present succeeding the previous. The impression of 'directional' passage of time. It is the subjective experience of *the sequence* of processing of sensory information into a consciously perceived product.

Two futures

One 'future' is the not yet received sensory data that already exists in the environment. It can be called the pre-written future. The potential data produced could be from spontaneous emission, reflection of EM waves, the production of pressure waves which will be interpreted as sound, release into the environment of other data such as

chemicals in the air that can be detected by artificial detector or organism. The time between production and receipt will depend on the type of data, and distance from source. Transmission time for pressure waves and chemicals in the air can be affected by air currents.

EM radiation potential sensory data is important to physics as the distribution of this in space and the relation to an observer gives relativity and non-simultaneity of events for different observer positions and motions. This 'relic information' is often (insufficiently) thought of as being the past since the event producing the data has already occurred unobserved. Potential sensory data pertaining to an event received and processed into the present of one observer, and already past experience of another, may yet be to be received by a more distant observer; and is in that regard his pre-written future. The events to which the pre-written future pertain are fait accompli. Even if the potential sensory data produced is not received until long after, the events that will be observed are inevitable as they have already occurred in Object reality.

When ancient information is received, and formed into images it must be remembered that although the event in Object reality has occurred the data is only Now being formed into a present Image reality. It is a present Image reality pertaining to an ancient Object reality or pertaining to amalgamated information from Object realities that did not co-exist.

The other future (pertaining to material reality) is *open and non-existent*: The imagined nothingness prior to actualisation. That is called the unwritten future to contrast with the pre-written future. The Open future is an imaginary, nonexistent realm not the source of material reality. This open, unwritten future is necessary to allow partial non-determinism and free will. It can be imagined as what will be but it doesn't have ontic or phenomenal reality. As it does not exist there can be no time travel into that future. Likewise, as the past does not actually exist. (Though there may be evidence of its having been, in records and memory, and structures that persist, experience-able within the observed present.) So, there can be no time travel to the past. The time dimension only applies to the informational content of electromagnetic and other sensory data in

the environment; not to existing material actualisations outside of the fully simultaneous Uni-temporal Now.

The configuration of Uni-temporal Now need not be fully determined by the former arrangement as there may be some randomness, where there is more than one possible outcome, only one of which is actualised in the new configuration. There is only sufficient material to produce one new configuration and so there cannot be a branching into alternative material outcomes. Those configurations not actualised remain as historical theoretical possibilities only. This is very different from a space-time continuum or block-time universe in which all space and time exists, there is complete determinism and no change, and therefore no true randomness as all outcomes are inevitable.

The past

The object universe is continually changing due to the relations of its constituents and resultant forces. It can be thought of as a pattern that is ever changing. The uni-temporal Now being subsumed by the next Now so there is no enduring material past but there are imperfect and incomplete records, including memory (which is plastic and not fixed). There is in no sense a past that has separate existence. Remaining relics, information and records that all exist in the uni-temporal Now.

Some parts of the configuration will continue across the sequence of Nows but they are not the past itself but fully part of the current Now. Yet allow some knowledge about former configurations and events; such as by archaeology and paleontology.

The present

Present/ present-now /here-now /"now";

All terms for the observed manifestation formed by an observer from received sensory data and formed through internal processing into a representation of external reality.

Either referring to just the appearance in space (present), in space/time (present-now or here-now), or in time("now"). These latter terms are synonymous with the present. It should be noted that ‘now’ is not Uni-temporal Now. Uni-temporal Now is the material configuration of the Object universe that precedes all present or now manifestations produced from information emitted during that configuration.

The source of present experience may be events occurring externally to the observer or reported to him/her in real time such as a live TV show. The temporal delay between the recording of the material event and the observation of the show will not alter the perception of it as occurring "now".

There will be informational temporal spread within the product because of differences in origin of the information amalgamated into it. This is far more precise and suitable for physics than the term ‘present’ and ‘now’ as used in general parlance.

For visualization of what is happening: If the information produced in each iteration of Object reality is imagined a different colour (rather than keeping in mind the temporal origin), it is easy to recognize that the reality that emerges from processing of that data is an amalgamation of multicoloured data pertaining to different configurations of the Object universe, an emergent space-time map.

The sense of vision that allows production and utilization of such maps is an important survival attribute for living organisms. That the map is emergent space-time is just a consequence of its production from received sensory data but that distant objects also appear smaller due to visual angle enables decisions about proximity of predators, competitors and resources to be 'calculated' which is greatly advantageous for a living organism. Not only does light take minutely longer to reach an organisms sensory system, so does it take time for a predator or competitor to traverse that space interval and it also takes time for the organism to move itself towards resources. By time I am referring to sequential change in the arrangements of the constituents of the Object universe.

Non-simultaneity of events for different observers can be regarded as a difference in

their emergent space-time maps that have been produced from sensory data within the uni-temporal external reality. It is not an indication that the events witnessed in each observer's present still exist as interactions of substantial bodies in external reality, IE persisting for all time within an external space-time continuum.

Experiments, using computer simulations, might show that space-time representations can be fabricated by self-organizing learning systems given a changing environment, in which they must successfully navigate to 'survive'. The algorithms that develop could be studied and possibly be used to create a reconstruction of the environment from the virtual organism's representation of it.

The Grandfather paradox

The idea of time traveling and the paradoxical possibilities appear to have been considered since the 1930s and possibly earlier. There are several variants of the Grandfather paradox. The Grandfather paradox occurs when a time traveler goes back in time, kills his own grandfather so his father is not born and so is unable to father the time traveler. Therefore, the time traveler cannot travel back in time to kill the Grandfather. Another version of the paradox is called Autoinfanticide, in which the time traveler kills himself as a child.

Several possible solutions have been suggested by scientists. One suggestion is the time traveler jumping onto an alternate past when arriving back in time. So it isn't his own Grandfather that is killed but another version, or proceeding forward on an alternate time line after the fatal event. His original future remains unaltered, but he does not return there but to a different future. Another suggestion is there being a physical rule that prevent changes occurring that will alter time. The idea that there is zero probability of events happening that lead to paradox, due to physical prohibition, has been expanded on by Seth Lloyd and others. Proposing that probabilities alter to prevent impossible outcomes.

Why the Grandfather paradox cannot occur.

Realizing that different observers experience same events at different times and in different ways led Einstein to consider that events, past, present and future exist spread within a space-time continuum. This reasoning leads to the Grandfather paradox.

The EM information contained within the Data pool of potential Image realities is distinct from the Object reality of substantial source objects now existing; that co-exist within Object reality with the EM radiation distributed within the environment.

The Grandfather paradox is based upon that assumption that non-simultaneity of events requires substantial object persistence rather than just persistence of the potential sensory data from which to construct Image reality present experience. It confuses Image reality with Object reality. *The Grandfather paradox is therefore based upon a category error*.

KEY:

Ab absolute, A actualised, D definite, EOOR, Element of Object reality, EOIR element of Image reality, LFS limited fixed state, M manifestation

(Ab A EOOR) Grandpa ≠ (D LFS M EOIR) Grandpa

Substantial Object Manifestation

That there is non-simultaneity of experienced events, should not be used to suppose that the object sources of the potential sensory data received must remain unchanged. As the Image reality output depends only upon the receipt of potential sensory data already emitted into the environment. The pool of EM data allows different observers to receive and process that data into different outputs. Location and motion relative to the sensory data in the data pool determining what data is received.

The EM potential sensory data is not the substantial past, present and future; only the potential to form Image realities of former objects and events. The object sources can change, move or cease to exist after the EM radiation is emitted that persists in the environment by which former arrangements, forms and events will be experienced.

The no longer substantially existing, is unambiguously, different from that which substantially exists and that which has not existed Sensory data persists in the environment receivable by different observers at same and different times, giving non-simultaneity of events. There is no need to suppose there is a space-time continuum in which substantial realities persist in form and configurations throughout all time. It is not necessary for physics that substantial events themselves that persist. It is likely they do not persist, as doing so permits paradox.

Without the space-time continuum and the possibility of time travel all Causal loop or Bootstrap paradoxes are also eliminated. So too is the possibility of a working Tachyonic antitelephone. As there is no possibility of backward time travel even for particles; as there is no foundational time that is separate from the extant configuration of the uni-temporal Object universe.

If material object time travel is shown to happen, with or without a space-time Worm hole it will disprove the explanation of its impossibility.

The Andromeda paradox

A paradox set out by Roger Penrose drawing attention to how two different observers could have very different presents in relation to distant events.

Quote “Two people pass each other on the street; and according to one of the two people, an Andromedean space fleet has already set off on its journey, while to the other, the decision as to whether or not the journey will actually take place has not yet been made. How can there still be some uncertainty as to the outcome of that decision? If to *either* person the decision has already been made, then surely there *cannot* be any uncertainty. The launching of the space fleet is an inevitability. In fact, neither of the people can yet *know* of the launching of the space fleet. They can know only later, when telescopic observations from earth reveal that the fleet is indeed on its way. Then they can hark back to that chance encounter, and come to the conclusion that at *that* time, according to one of them, the decision lay in the uncertain future, while to the other, it

lay in the certain past. Was there *then* any uncertainty about that future? Or was the future of *both* people already "fixed"?" (Penrose. R. 1989). **16**.

The Andromeda paradox is understood by realizing there is a significant category difference between what is *experienced as a present event* through receipt and processing of EM information *including the potential for such experiences*, and events in which substantial elements of material reality interact, i.e. source events.

Interactions occur in Object reality that is uni-temporal (same time everywhere). It can be considered the causality front. When an event happens in the source Object reality is definite, and uni-temporal. ***That event having happened in Object reality is true for all locations***.

Potential sensory data is produced by reflection /emission of light from those events, which can be named the pre-written future, (not to indicate complete determinism within physics, but that *the data to form observable manifestations exists prior to their experience*.) The Object reality or source reality, and Image reality *experienced present* manifestation are not synchronized.

When an event is (or potentially could be, as in this paradox) observed via its manifestations varies with observer location and motion; *The observer walking towards Andromeda is getting closer to the potential sensory data, from which a present experience could be formed, compared to an observer walking away*. Even though they are too far away to receive the potential sensory information.

So even though no invasion data is yet received, as Andromeda is too far away, it can be said that for the observer walking towards Andromeda, the potential sensory data emitted from the invasion events on Andromeda *are spatially nearer to* him and formation of that information into his present experience would be sooner. This does not however mean the source event occurred sooner. The source event occurs only once, and the time of that occurrence (iteration of the Object universe within the imaginary past sequence of iterations) is unique and unchangeable.

So “Was there *then* any uncertainty about that future? Or was the future of *both* people already "fixed"? (Penrose. R. 1989). **16**. If for one ‘observer’ the event has happened in

Object reality, and potential sensory information is in flight; it has happened for both. The event will have been superseded by more recent events and so be materially 'past'. Therefore, the invasion is a certainty (if all goes to the alien plan) because of the material occurrences, that are *independent of the distant observers*.

When the material event occurred, EM information will have been produced by reflection /emission. *The proximity of the information to an observer does not alter the material event, only when experience and thus knowledge of it happens*. The information not yet received can be regarded as a pre-written future, though it pertains to an event that has already materially happened. ('Future' as it becomes present experience when received and processed.) Yes, there was uncertainty *of timing* when the 'observers' met (that relates to potential information) but also material certainty. That event in Object reality is true simultaneously for all locations, so certain.

About the observation of a constant speed of light when travelling towards a light source.

For comparison: "By 1905 he [Einstein] had shown that FitzGerald and Lorentz's results followed from one simple but radical assumption: the laws of physics and the speed of light *must be the same for all uniformly moving observers, regardless of their state of relative motion. For this to be true, space and time can no longer be independent. Rather, they are "converted" into each other in such a way as to keep the speed of light constant for all observers."* Overduin, J. (2007). **17**.

Speed has a time component. If that time component comes from the received light information, then it varies as the relation of the observer to the 'light waves' varies. A confusion arises with the assumption that the spatio-temporal aspect of the product is a foundational space-time reality. Or if it is thought that the time component must not be variable. Think of the light travelled toward, approaching the source, as information. That information is content of the observer's present when it has been received (and processed in to what is seen). If the receipt of information is altered by the observers motion so correspondingly is formation of the observers present. If the information to

produce the present ‘product’ is obtained more rapidly so is its info-temporal content. If the information to generate the ‘product’ is obtained more slowly so is its info-temporal content. Now imagine that the light information has come from a clock.

Higher level processing:

The higher level, biological affects, giving a sentient being's reality interface product, a further level of emergent reality, can be added to any simulation of conversion of source Object reality to Image reality via sensory data receipt alone, or including only a simple processing time equally applicable to all sensory data, as might apply to an inanimate device.
It is necessary to add the neurological effects to the product that would be obtained from sensory data receipt times alone such as the product that would be obtained by a device treating all sensory data input in the same way *. * IE without adding and diminishing delays, according to the particular stimulus, or causing synchronizations of products pertaining to stimuli received at different times. This addition leads to yet another level of emergent reality separating inanimate simple processing and organic processing that incorporates analysis that is influential on the product. Such as the co-ordination of visual and auditory signals occurring within a certain time interval, explained by David Eagleman (2011), resulting in a coherent causal ‘story’.

David Eagleman's work (**15)** provides evidence that the Image reality produced depends upon the type of reality interface and possibly even the individual. Sensory data receipt alone does not always determine the amalgamation that is produced. The sequence of sensory data input *is modified* by the complex processing, prior to product generation that leads to the experienced present in the case of the human Prime reality interface and quite likely all sentient's reality interfaces. This extra processing aiding survival by providing coherent causal stories from diverse sensory input assisting with comprehension of the external environment and appropriate decision making.

It is very important to differentiate the Object reality of passage of time and the physics

of Image reality of time. It is also important to distinguish Image reality that pertains to all kinds of reality interface including radio telescopes, cameras from the product of further processing by the Prime reality Interface (the human sensory system) and those comparable but not equivalent sensory systems of other biological organisms, and possibly AI that will be developed. The subjectivity of individual experience due to differences in individual internal processing is not sufficient to dismiss the objective physics of Image reality production. That is the spatial potential sensory information distribution, transmission and relation to an observer determining the information that is received and when it is received; providing a categorical difference between foundational and emergent reality.

Unification/non-contradiction of classic relativistic and quantum Newtonian type time models

The two kinds of time foundational, sequential, uni-temporal and emergent, informational, relativistic allow physics using sequential time and physics using relativistic time to co-exist without there being incompatibility of the models due to the different kinds of time used. There needs to be recognition of which category of time applies to the physics modelled and to use the appropriate kind.

The paradoxes of relativity can be understood as stemming from a category error that confuses material objects and images of them produced by the information receipt and processing of observers.

About the category error

“The question of whether or not when you see something, you see only the light or you see the thing you’re looking at, is one of those dopey philosophical things that an ordinary person has no difficulty with. Even the most profound philosopher, sitting eating his dinner, has many difficulties making out that what he looks at perhaps might only be the light from the steak but it still implies the existence of the steak which he is

able to lift by the fork to his mouth. The philosophers that were unable to make that analysis and that idea have fallen by the wayside from hunger." Feynman, R. (1979). **18**

Though trivialized by Richard Feynman, the differences between substantial objects and images are not unimportant. Though they may bear the same object name they are not equivalent. The category error, not differentiating between externally existing objects, consisting of atoms and particles, and images being perceived (insubstantial manifestations, outputs of sensory data processing) is identifiable within Einstein's "on the Electrodynamics of moving bodies paper.

That does not mean that relativity in relation to electromagnetic phenomena, (affecting measurement), is a mistake. It is an important part of physics. Happening and what exists in Object reality is not identical to what is seen to be happening and what is seen to exist for observers in significant fraction of light speed motion scenarios.

As the scenarios are about what is seen, the acuity of the sensory apparatus and manner of processing the information is relevant to what would be seen.

Further discussion of the category error will be presented elsewhere.

Appendix:

Evidence for another component of Object reality and member of the set representation:

Seeing the buildup of a banded film in a double slit experiment, using singular particles, need not imply the electrons, photons or other particles to be merely the isolated objects, revealing their intrinsic nature, identified by a snap shot detection of position or momentum. Rather it seems to imply they are something interacting with and altering its environment. Giving a cumulative manifestation resulting from the entirety of behaviour of that system and its effect.

The presence and influence the particle has, as it interacts with its environment, fluctuates in space with time in unseen change in Object reality. Causing diffuse change, an environmental effect or wave like disturbance. Consider a medium that can be

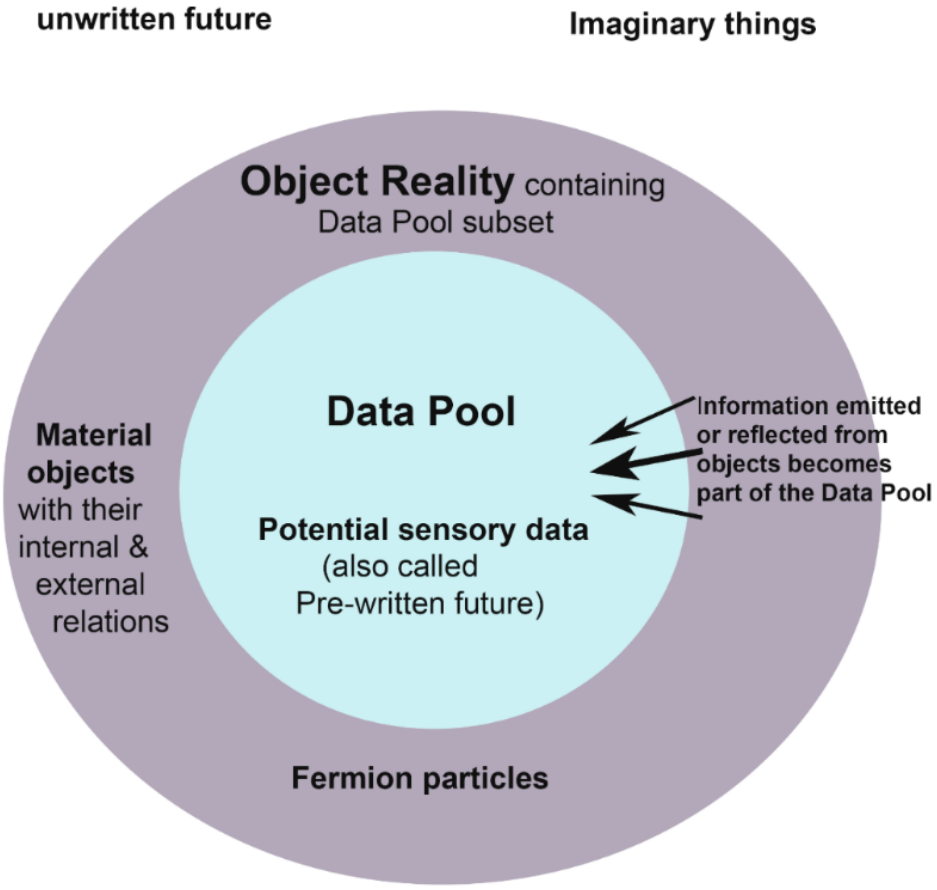
disturbed by movement within it. The movement of an electron through it could set up sympathetic vibration of a surrounding medium, as well as any wave motion resulting from vibration the apparatus components. In the double slit experiment upon reaching the double slits the wave disturbance of the medium will pass though leading to interference of the waves. There could then be feedback from the vibration of the medium to the movement of the particle beyond the slits, leading to the interference pattern seen at detection.

This would explain why electrons fired individually through the apparatus will build up a wave interference pattern built from the detected positions of the individual electrons. The electron itself is not a wave, but environmental feedback onto momentum and final detected position results in perception of a wave like phenomenon in perceived Image reality. *This experiment provides experiential evidence for a medium of transmission of sub atomic particles and light in an unobserved Object reality*.

The medium itself is undetectable, it cannot be observed because it is inert, does not reflect EM radiation or sound waves or have an odour or taste and so does not provide information about itself for detection by the senses and inclusion in Image reality. Being unseen does not mean that it is not there. *Its existence is implied by the experiment*.

RICP disgram construction
part 1 Object reality

An introduction to aid later comprehension of more complex diagrams.
In response to feedback on their complexity and consequent difficulty in reading the explanatory framework diagrams



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